

IB Geography Internal Assessment

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Introduction

The Central Business District (CBD) of a town has the highest accessibility, highest concentration of tall buildings, predominance of commercial land use and a lack of open space, housing and industry. CBD's are usually identified through these factors, and by basing the investigation on the CBD in Singapore the aim would be to determine whether the country's CBD has these general characteristics.

Research question

To determine whether the CBD in Singapore follows the standard general characteristics of a typical CBD.

Missing introduction and geographical context

Intro:

What is the significance of the data that you intend to collect

. E.g CBD is characterised by high concentration of very tall buildings. Does the CBD of Singapore have

The URA has defined a CBD (look for reference), so the aim is to explore if the CBD of Singapore has those typical characteristics.

Geographical context: where is the place that the fieldwork was done, draw a map of Singapore showing the place and a detail map of the study area. Place your base map here.

Method of investigation

Required data:

1. Building height
2. Pedestrian count
3. Type of land use

How was data collected?

First and foremost, the area of investigation was split into 7 sections. With two geography classes in our year, the classes were altogether split into 7 groups, with each group conducting the research in our allocated area. The area was divided into 7 sections because it was not ideal for everyone in the whole class to each conduct the investigation covering the entire area.

- Building height

The height of buildings was collected to aid in our investigation to see the varying heights within and around the CBD. The building height was recorded by counting the number of floors, as measuring the actual height of the buildings would be impossible. Each group collected this data by recording on a sheet of paper the height of buildings in every street within our allocated area of investigation.

- Pedestrian count

The pedestrian count was collected to gauge the areas in which had a high volume of pedestrians. This was done through random sampling, with each member in a group picking any road or section within the allocated area to conduct this investigation. At that particular chosen road, each member then recorded the number of pedestrians that passed by the spot using a hand tally at intervals of 2 minutes over the course of an hour. The two groups went at different sessions, with the first at 0830 – 0935 and the second on a different day at 1130 – 1221. The reason for the different sessions was due to timetable constraints. Each session also included the recording of vehicle count, and this was done by alternating the recording of the two at intervals of every other two minutes. I chose to conduct this investigation of pedestrian and vehicle count on Sago St because it seemed an ideal place for pedestrians and cars to pass by, as there was a car park there. In addition, there was a temple located on the street therefore it would mean that there will definitely be people passing by the street.

- Land use

The purpose of this collection was to basically identify within the area of investigation the different types of land use present. This was recorded at the same time of the collection of building height. As the height of the buildings was measured, we at the same identified the type of land use on that particular area.

Data analysis

According to geographical theories, some general characteristics of a CBD are:

- It contains the tallest buildings in the city (due to high rent)
- It has the greatest number and concentration of pedestrians
- It contains the highest proportion of offices.

Using appropriate geographical theories, I will now evaluate whether the CBD of Singapore depicts the general characteristics of a CBD.

Singapore's CBD

Looking at the map, the highlighted region indicates the supposed CBD of Singapore according to the Urban Redevelopment Authority (URA) of Singapore.

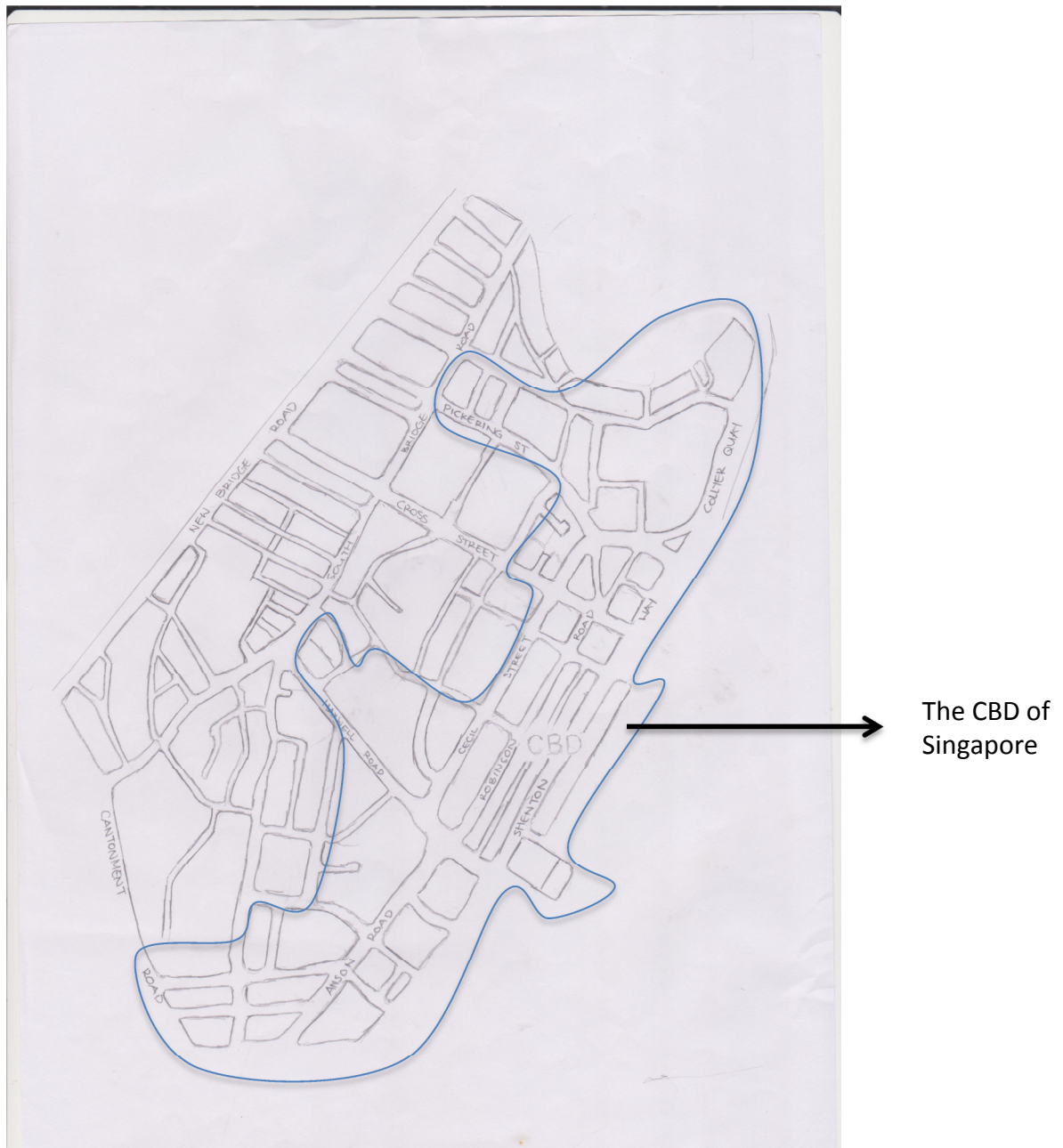


Figure 1

- Building height

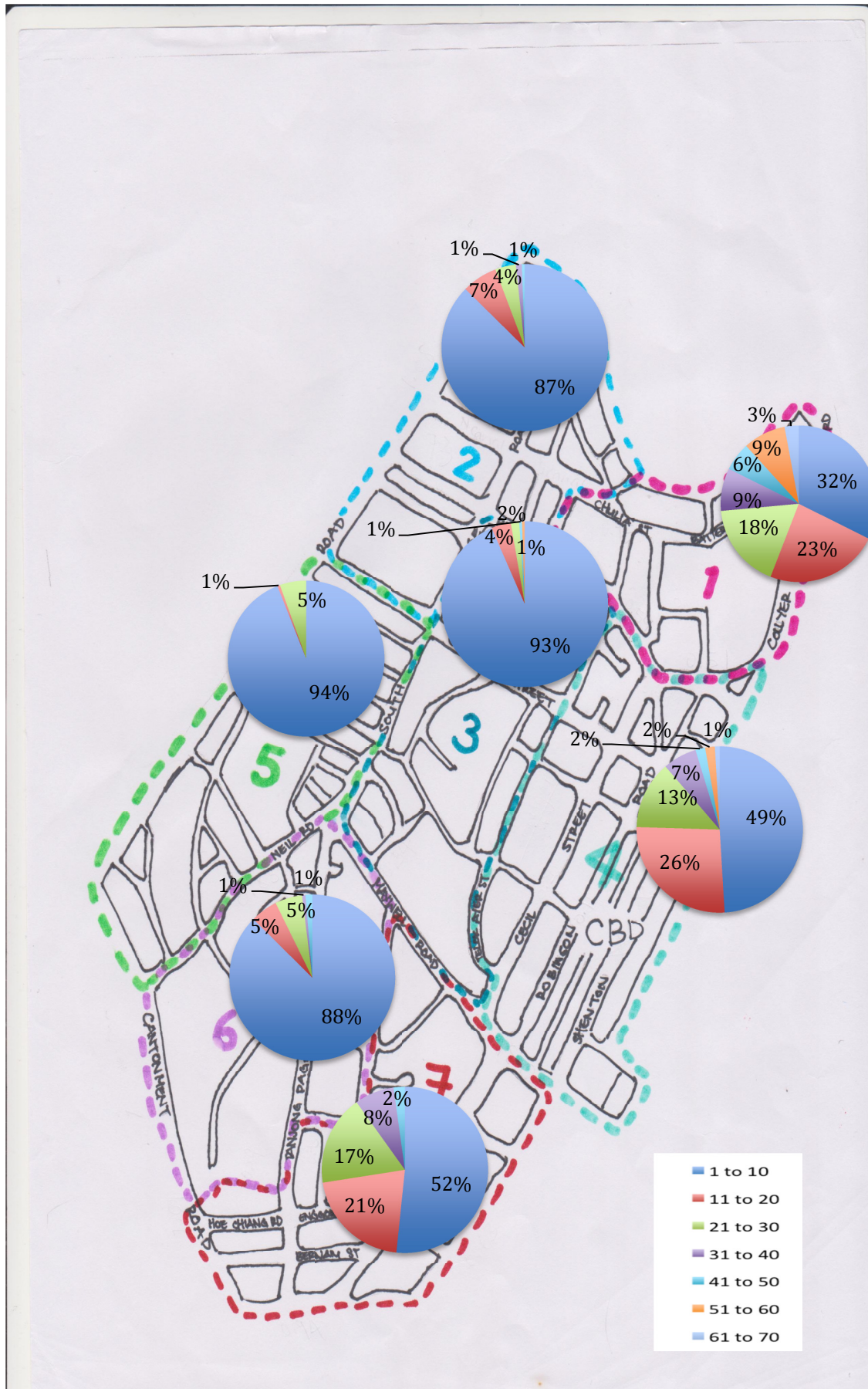


Figure 2

Claire Chia

Looking at the results of the building height, it can be seen that the areas with the highest concentration of building height are in Zones 1, 4, and 7- all in which happen to fall under the highlighted region: the CBD. As the distance from the CBD increases westwards, a significant drop in building height can be seen.

- Pedestrian count



Figure 3

Pedestrian count is also seen to be the highest in Zones 1, 4, and 7. The highest average number of pedestrians recorded per 2 minutes was 113 in Zone 4.

- Land use

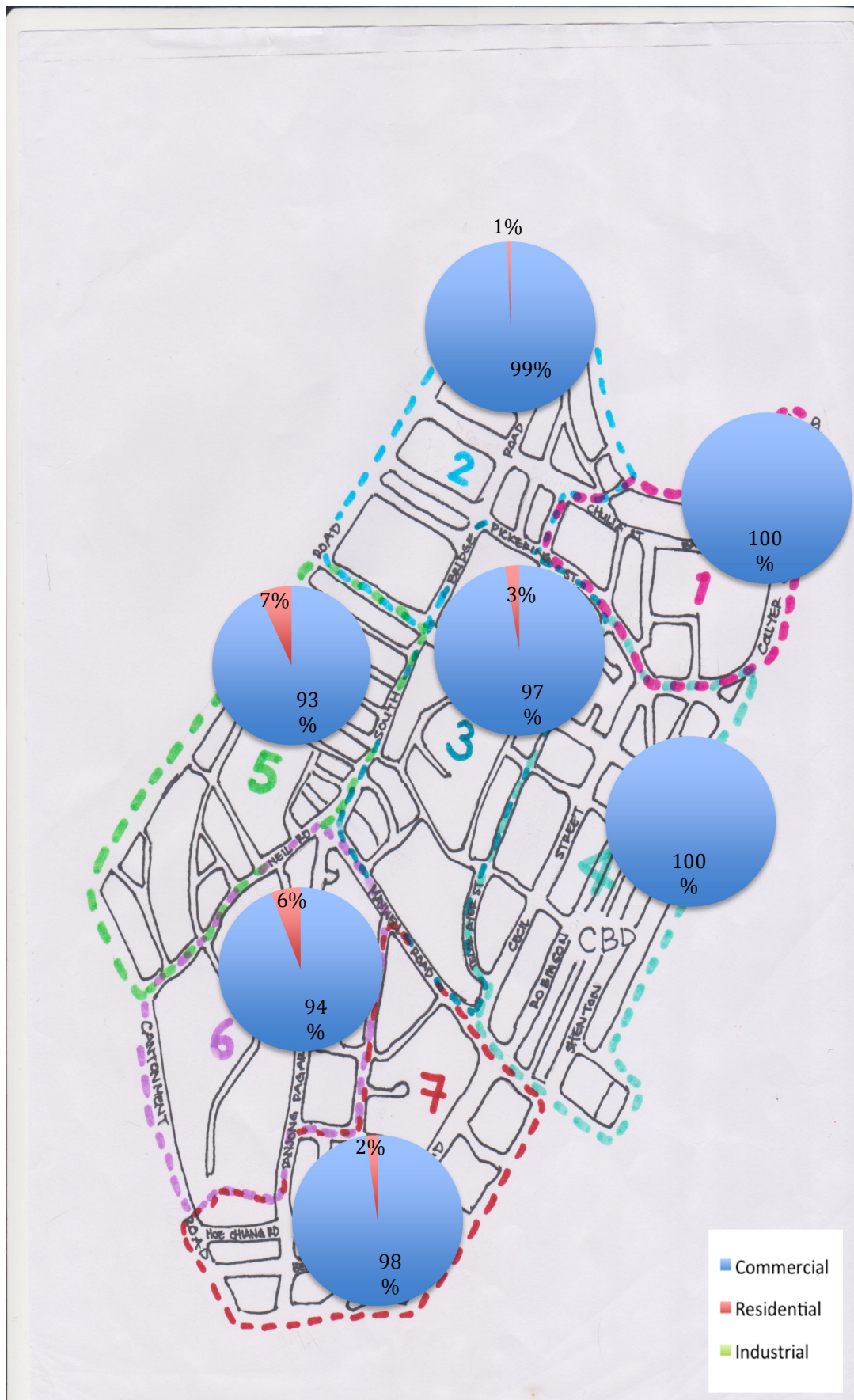


Figure 4

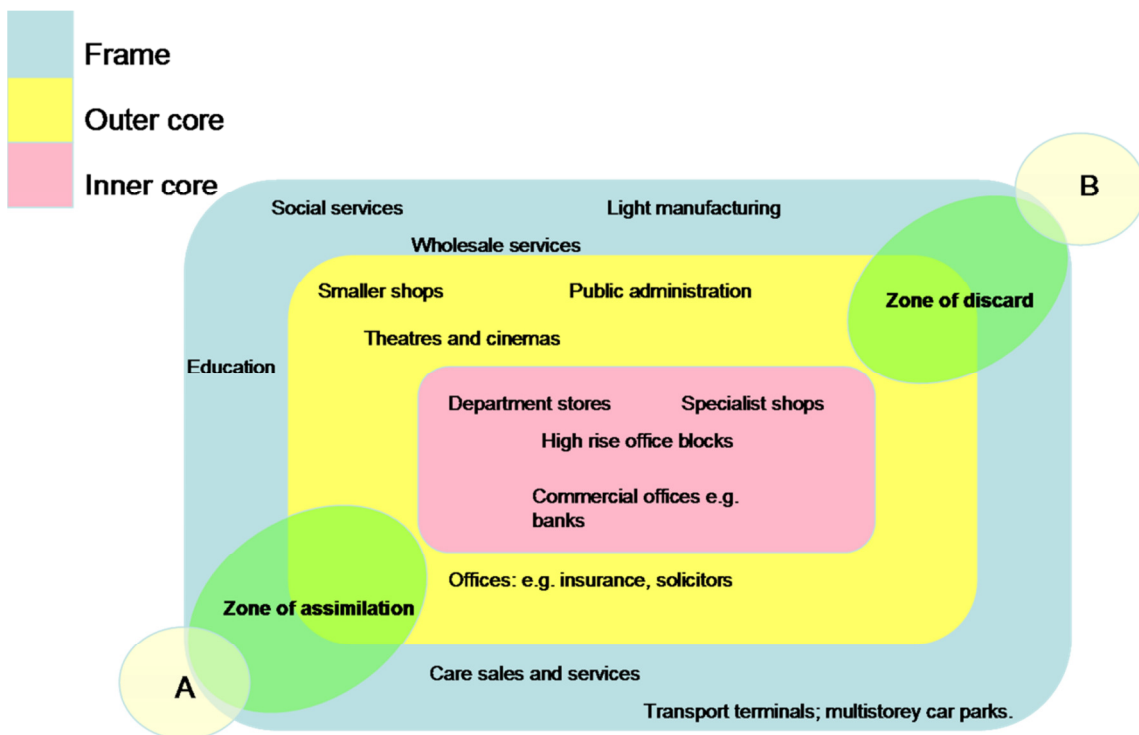
From the results obtained for land use, the majority of the area investigated fall under commercial land use. Within the whole area, it has been found that none of these places are categorized under industrial land use.

Mapping the characteristics of the CBD (Data Analysis)

One model that can be used in identifying the characteristics of a CBD is the core and frame model. Its purpose is to show the urban structure of CBDs, where it includes an inner core, outer core, and a frame. To determine which area of a CBD fits the different aspects of the model depends on several factors, and some of these factors overlap with those characteristics of a typical CBD according to geographical theory.

The characteristics of a core and frame model:

- Inner core is where the most high-rise buildings are found due to expensive land
- Outer core and frame have lower land values and are less extensively developed



A=Better residential properties; B=Heavy industry and poor residential

Figure 5¹ - Core and Frame Model

Hence this model can be used to aid in determining the research question as well. But first, the general characteristics would have to be identified first.

A clear link can be distinguished between the building height and distance from CBD. As shown in the above figure 2, as we move away from the CBD, the percentage of buildings 11 floors and above fall drastically. Moving towards the west of the CBD to Zone 3, the percentage of buildings 10 floors and below increases notably to 93

¹ <https://sites.google.com/site/thegeographicalempanadas2012/core-frame-concept>

percent, as compared to the main base area in Zone 4 where the percentage is lower at 52. Moving further away from the base again to Zone 5, the number of buildings under 10 floors again increases to 94 percent. No buildings taller than 30 floors can be found in this area. From this, it can be deduced that the height of buildings decreases as we move away further from the CBD. This is one of the characteristics of a CBD according to geographical theory, where building height increases towards the CBD due to its high rent and land value. As land value is very high in this area due to competitiveness, this results in vertical development hence buildings tend to be very tall. To reinforce this theory, the CBD in Singapore does indeed have high rental prices in the areas where the highest concentration of tall buildings can be found. Take Zone 1 for example, 45 percent of the buildings in that area is 21 and above floors high. Several offices that fall within that area are: 6 Battery Road and UOB Plaza, and rental prices are extremely high at \$14.00 and \$13.00 per square feet respectively, as compared to other places within the area of investigation, like Ann Siang Street and Telok Ayer Street (both Zone 3) where it costs between \$3.50 - \$5.50 and \$3.00 to \$5.50 respectively to rent a shop house.

Other aspects contribute to this theory as well. Take for example the number of pedestrians. In a CBD, pedestrian count is said to be of the highest volume and concentration. The inner core is therefore supposed to have a concentrated number of pedestrians. Looking at the results of the pedestrian count, the highest number of pedestrians recorded was all found to be within the CBD. Some examples include 64 and 113 average number of pedestrians per two minute in Zone 4, 97 in Zone 1, and 38 and 59 in Zone 7. As we move towards the outer boundaries of the CBD, a fall in the number of pedestrians can be seen. However, the numbers are quite erratic, and the pedestrian count increases at the very edge of Zone 5, one of the edges of the area of investigation. The numbers are relatively higher than those in other zones out of CBD in Zone 5, especially along Banda Street and New Bridge road where the numbers are 37 and 34 respectively. Although this area is quite a distance away from the CBD, where pedestrian movement is supposed to be the highest, it could be because Zone 5 is located around where Chinatown is, an area where many tourists visit, especially Banda Street where there is a temple. It also could be due to the presence of various specialty shops where people go to buy goods, or due to people going for lunch at the eateries. Zone 7, Zone 5 (especially these two zones, where pedestrian count was conducted during lunch time), have eateries within this area (hawker centres, markets). Hence high numbers could be a result of people patronizing these eateries.

Another characteristic of a CBD is that it contains the highest proportion of offices. In other words, commercial land use is vast in that region with either very little or no residential land use at all. Referring to the pie chart of results for land use in the areas of investigation, this characteristic can be applied to the CBD of Singapore. The results shown above prove this characteristic, with most parts of the CBD dominating in commercial land use: Zone 1 at 100 percent, Zone 4 at 100 percent, and Zone 7 at 98 percent. Residential land use is shown to have increased, but only by a slight percentage, as we move away from the CBD. In fact, within the whole area of investigation, few residential areas can be found. The reasons for the high proportion of commercial land use is that outside the CBD, a large number of shop houses are

located in those areas- Zones 2, 3, 5, and 6. These are mostly small specialist shops, unlike in the CBD itself where the dominance in commercial land use is due to the presence of high-rise offices.

Taking all these factors into consideration, it can be deduced that all areas of my investigation clearly fit into the model. An inner and outer core can be identified within this area of investigation. Referring to the model, the inner core can be identified as the CBD of Singapore (highlighted region: Zones 1, 4, and 7) as the characteristics match those of the model. Since a match can be seen, it is therefore proven that the CBD of Singapore does indeed fit into the general characteristics of a typical CBD.

Anomalies

One anomaly that can be identified is the unusually high number of pedestrians for its location in certain areas of Zone 5. As high pedestrian count is supposedly to be concentrated within the CBD, the result for this is strange considering its distance from the CBD. This could be because the area is frequented by tourists due to its close proximity to Chinatown. If this anomaly was not present, my results would have shown a clearer pattern.

Conclusion

This essay has analysed and evaluated the extent to which whether the CBD of Singapore has the characteristics of a typical CBD. From the data obtained, it can be seen that the trends of the CBD in Singapore are the same as those of a typical CBD. And with such trends identified, they have also been found to be able to match into the core and frame model. This therefore reinforces the idea that the CBD of Singapore follows the characteristics of a CBD.

Evaluation

Overall, the investigation went on rather smoothly. Despite the several limitations, I was still able to answer the research question clearly through the data collected under the results and findings. The characteristics were easily identified from the collated data, where it showed the decrease in building height as we move away from the CBD, the highest concentration of pedestrians was found in the CBD, and the slight shift in land use as we move towards the outer core. However, there is inconsistency in the recording of building height and land use. From the data collected, there were a lot of missing information, with some groups failing to indicate the type of land use in particular areas, and the building height and number of buildings present. With all these missing information, I tabulated the data with what I had but the results may be inaccurate. For example, without the accurate number of buildings per road, collating the results into a pie chart is difficult, as the exact number is required to ensure a set of reliable data.

