

**To what extent does Hong Kong fit the pattern of decreasing land values with increasing distance from the Peak Land Value Intersection (PLVI)?**

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## 2 Introduction

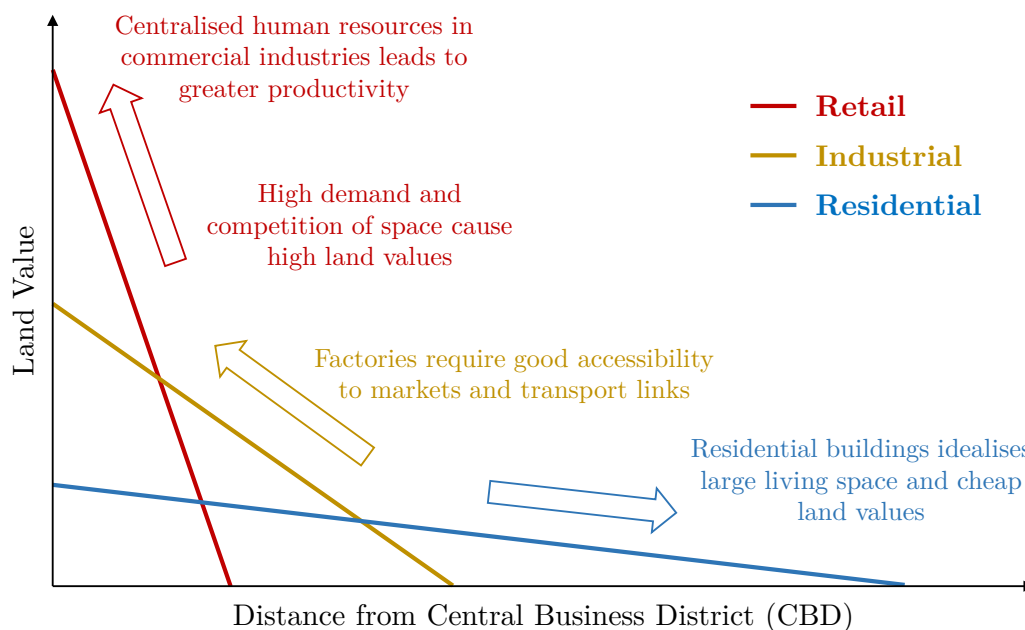
This study will be focused on to what extent does Hong Kong fit the pattern of decreasing land values with increasing distance from the PLVI. This is closely related to the Urban Environments section of the IB Geography syllabus because the bid-rent theory and various urban land use models have been extensively explored.

### 2.1 Hypothesis

Due to the impracticality of obtaining an accurate land value, the building height is chosen to be the proxy indicator for this study.

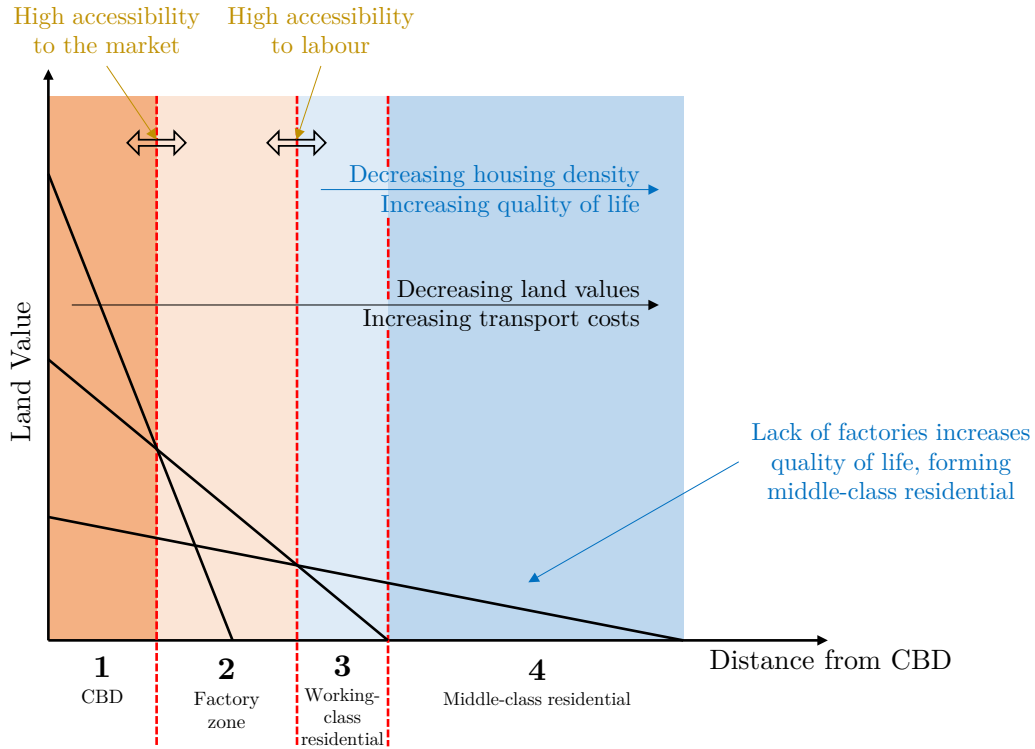
The set of hypotheses are:

1. Null Hypothesis ( $H_0$ ): The height of buildings in Hong Kong will not decrease with increasing distance from the PLVI.
2. Alternate Hypothesis ( $H_1$ ): The height of buildings in Hong Kong will decrease with increasing distance from the PLVI.

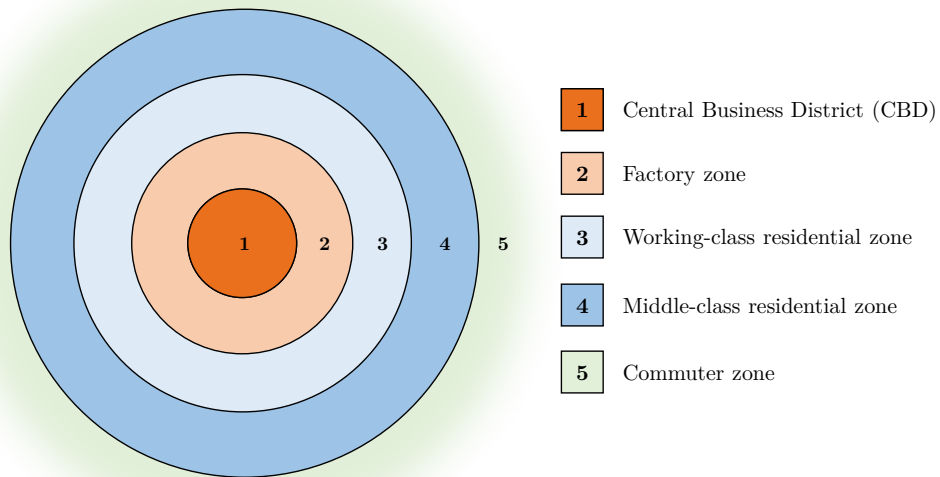


**Figure 1.** The bid-rent theory. (Ahlfeldt et al.; Alonso).

Figure 1 demonstrates how the decreasing demand and competition for real estate causes decreasing land values with increasing distance from the CBD (Alonso).



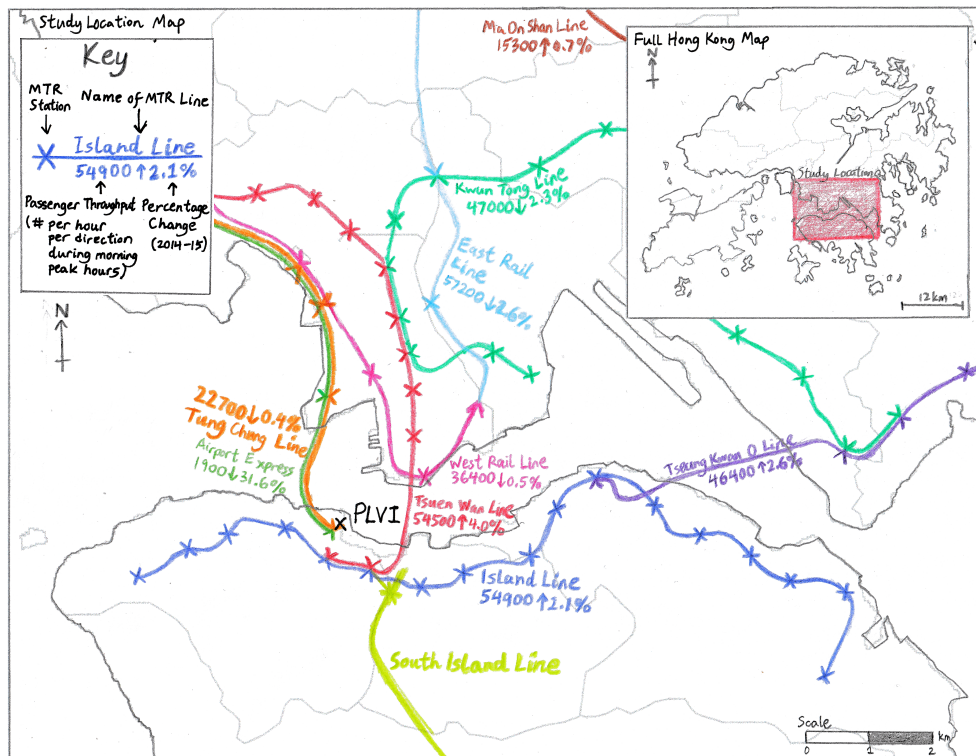
**Figure 2.** Determination of land use types from the bid-rent theory.



**Figure 3.** The Burgess Model (Burgess).

As land in Hong Kong are sold to the highest bidder, land developers will aim to utilise the land by maximising the gross floor area, which they will do so by expanding vertically. As a result, the building height generally increases as the land value increases. Highly profitable commercial industries will therefore locate high-rise skyscrapers closer to the CBD, while citizens with less purchasing power will live in low-rise buildings further away from the CBD.

## 2.2 Site of the study location



**Map 1.** A map of PLVI and the Mass Transit Railway (MTR) links in the study location. (Legislative Council Panel on Transport Subcommittee and MTRCL; LLC)

The PLVI is defined as a location in the CBD which has the highest land value and accessibility. Since land value is measured by the building height, the *International Commerce Centre* (460.4m (“HKMS 2.0”)) has been chosen as the PLVI. It is also within close proximity to 4 Mass Transit Railway (MTR) intersections, with the majority having a high passenger throughput, making the area highly accessible.

The *International Commerce Centre* (460.4m (“HKMS 2.0”)) is not chosen because it is not located within the CBD.

## 2.3 Incorrect Assumptions of the Burgess Model

While the bid-rent theory suggests decreasing land value as distance increases, several factors can support the null hypothesis, outlined below:

### 2.3.1 Hoyt's model

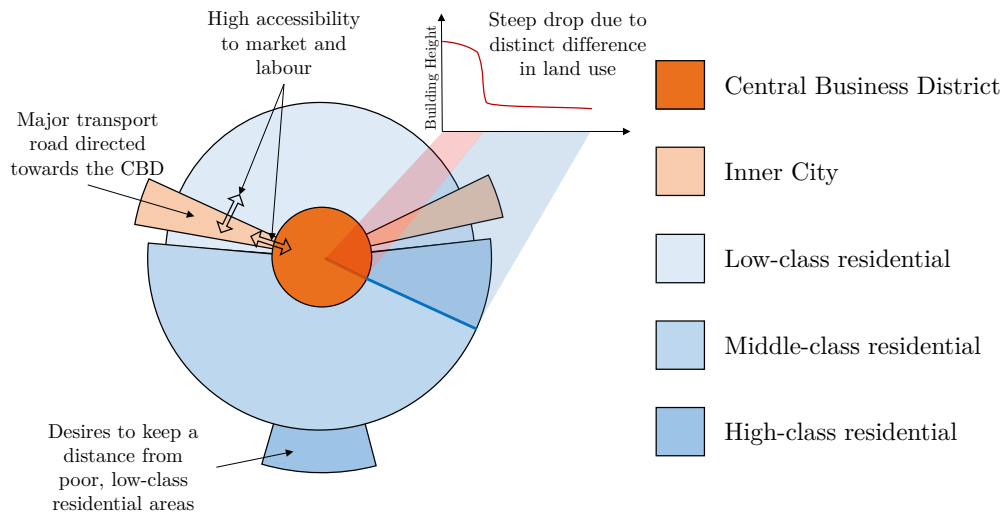


Figure 4. The Hoyt's model. (Hoyt)

Hoyt proposes an alternate model that accounts for the historical transport links that direct into the CBD, serving as a border between the low and high-class residential areas. The stark change in the value of the land uses may suggest a large difference in building height as shown in Figure 4.

### 2.3.2 Functional Zones

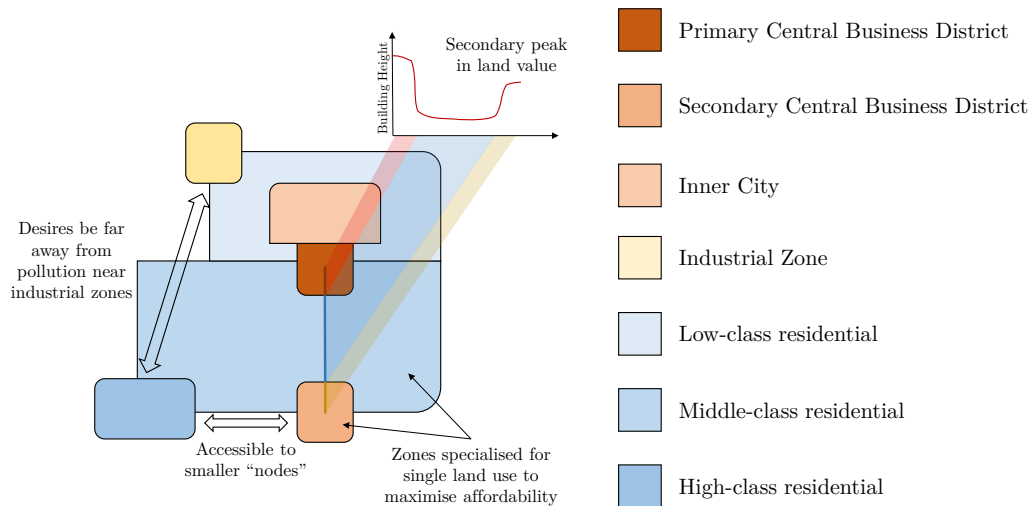
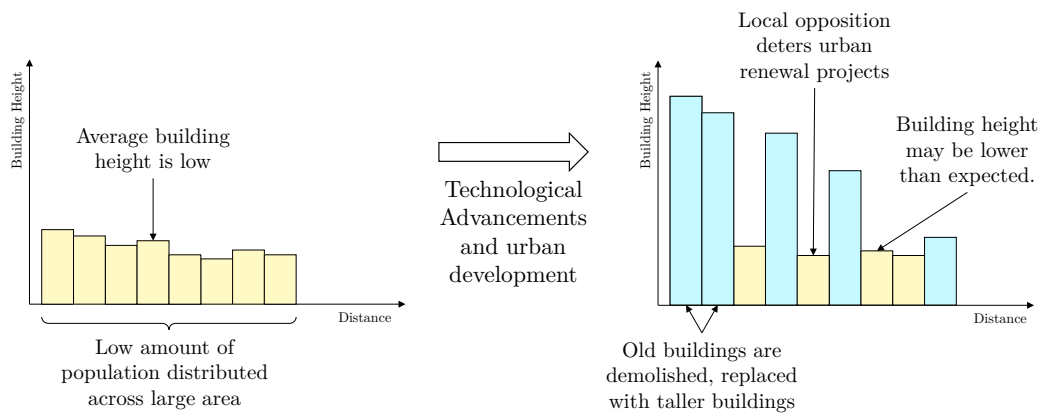


Figure 5. The Multiple Nuclei Model. (Harris and Ullman)

Figure 5 suggests that to maximise accessibility, small nodes will develop to secondary CBDs, each causing a secondary PLVI of a smaller magnitude outside the CBD.



### 2.3.3 Historical Development



**Figure 6.** Historical development of Hong Kong causing drops in building height.

### 3 Methodology

#### 3.1 Sampling Methods

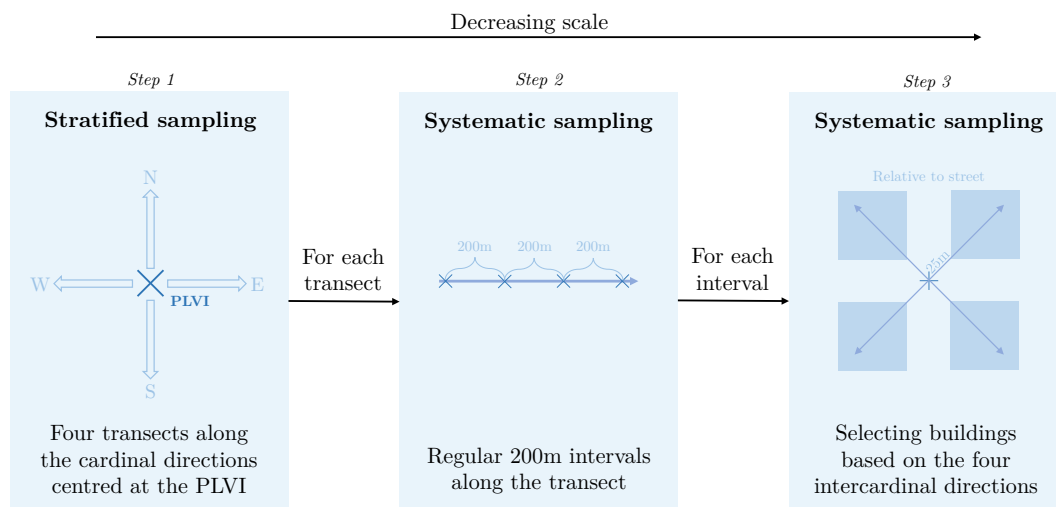
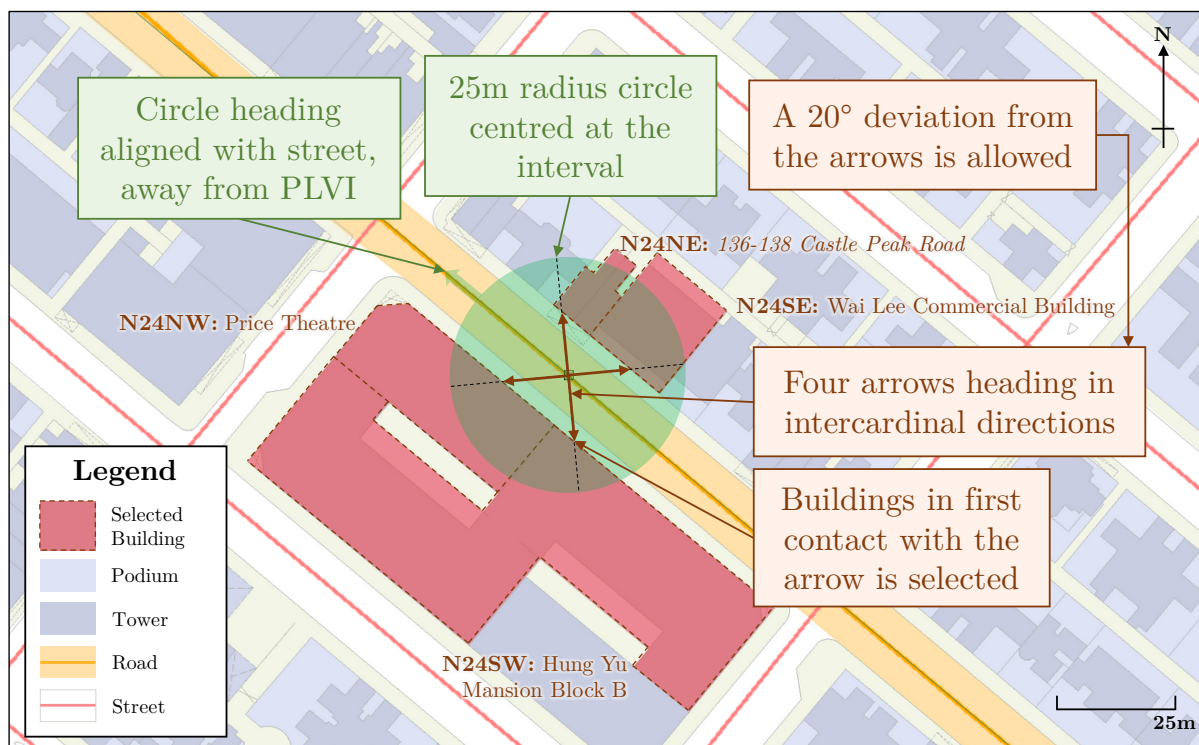


Figure 7. Outline of the process of selecting buildings as samples.

In Figure 7, stratified sampling is used in *Step 1* to maximise the spatial coverage of buildings in all directions, while systematic sampling is used in *Step 2* and *3* to obtain data with a randomness comparable to random sampling, while taking considerably less effort because all buildings will not have to be identified and marked prior to the sampling process. These methods therefore maintain an unbiased representation of all building heights.

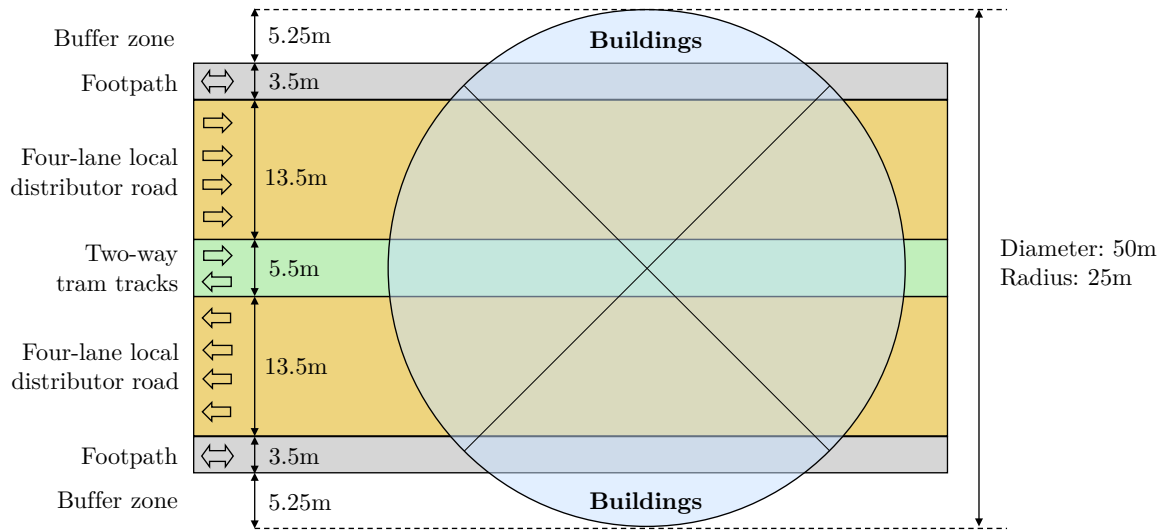
#### 3.2 Method of selecting buildings



Map 2. Example of the selection of buildings at the N24 transect. (Lands Department)

Intercardinal directions relative to the circle are not included because it has a high chance of not reaching a building when the interval is located at an intersection.

### Worst-case road hierarchy



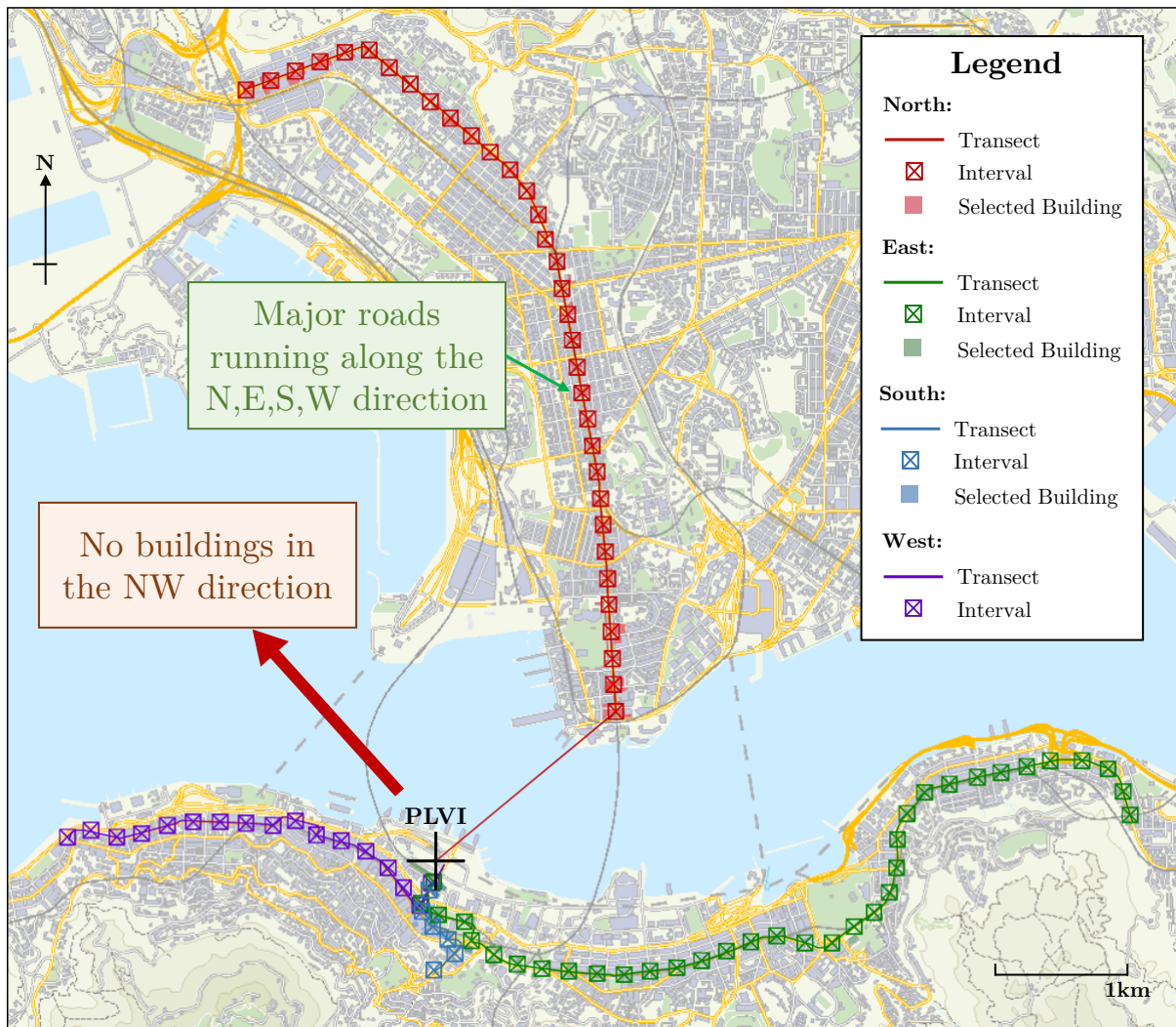
**Figure 8.** Justification on why a buffer of radius 25m is used. (Hong Kong Planning Standards and Guidelines)

Type	Examples (if applicable)	Reason
Schools		24m height restriction (“Cap. 279, Section 84”)
Residential Care Homes		24m height restriction (“Cap. 459, Section 23”)
Construction Sites		Inability to determine height
Government-owned buildings	Police stations, fire stations, ambulance depots, clinics, military barracks Social welfare buildings, ancillary service buildings, libraries, post offices	Land is owned by the government
Historical	Declared Monuments, Historic Buildings (defined by Antiques and Monuments Office)	Legally preserved
Recreational use	Parks, playgrounds, zoos, gardens, sports centres, sports grounds	designed with low building heights to maximise sense of “openness”
Transportation Infrastructure	Bus terminus, MTR stations, pier	Essential infrastructure that directly improves citizen’s physical and mental wellbeing
Hospitals		
Religious buildings	Churches, mosques, temples	
Exhibition Halls	Museums	
Waste-treatment facilities	Refuse or recyclable collection centres, sewage treatment facilities	<i>or</i>
Miscellaneous	electrical substations, broadcasting stations Cemeteries, funeral parlours, visitor centres, petrol-filling stations	Does not have financial incentive to build higher

**Table 1.** Buildings that are considered invalid.

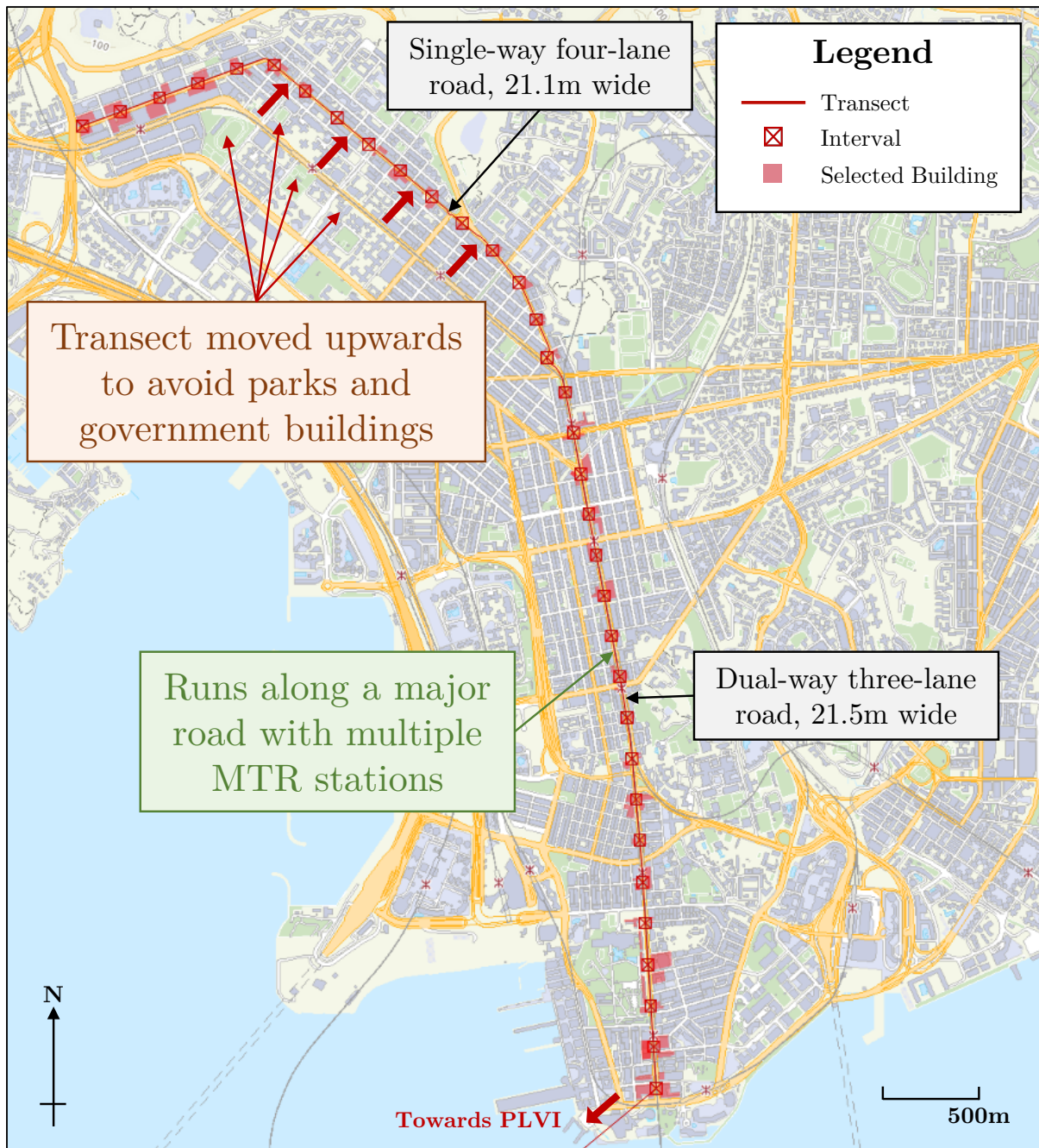
Buildings that fall under any category stated in Table 1 will be excluded.

### 3.3 Transects



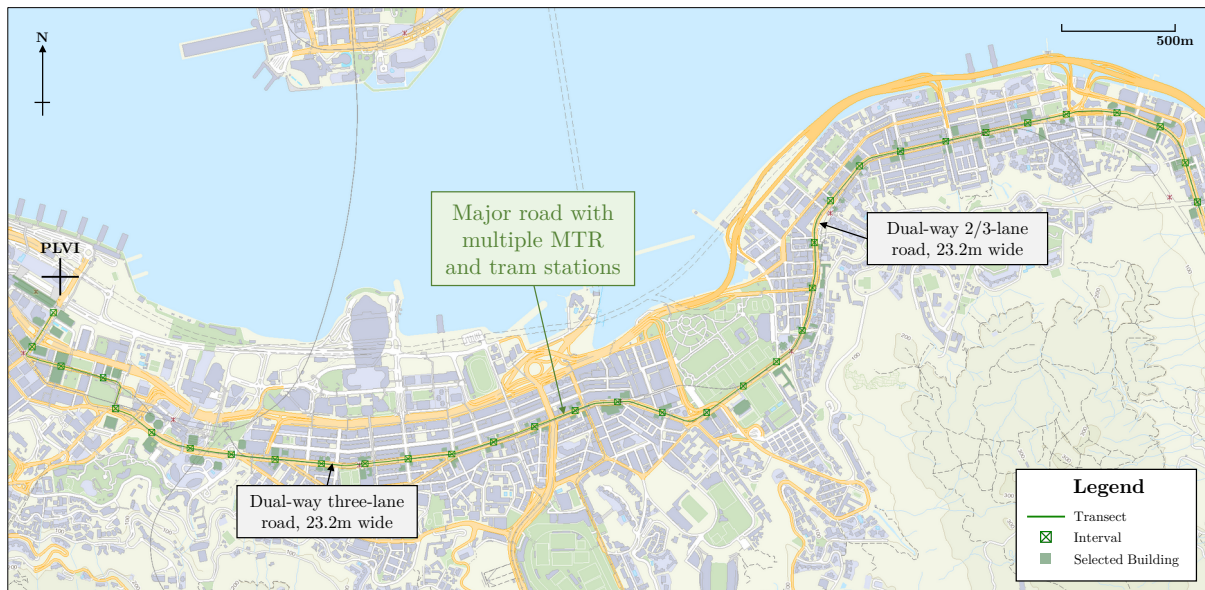
Map 3. Map of all four transects (Lands Department)

### 3.3.1 North Transect



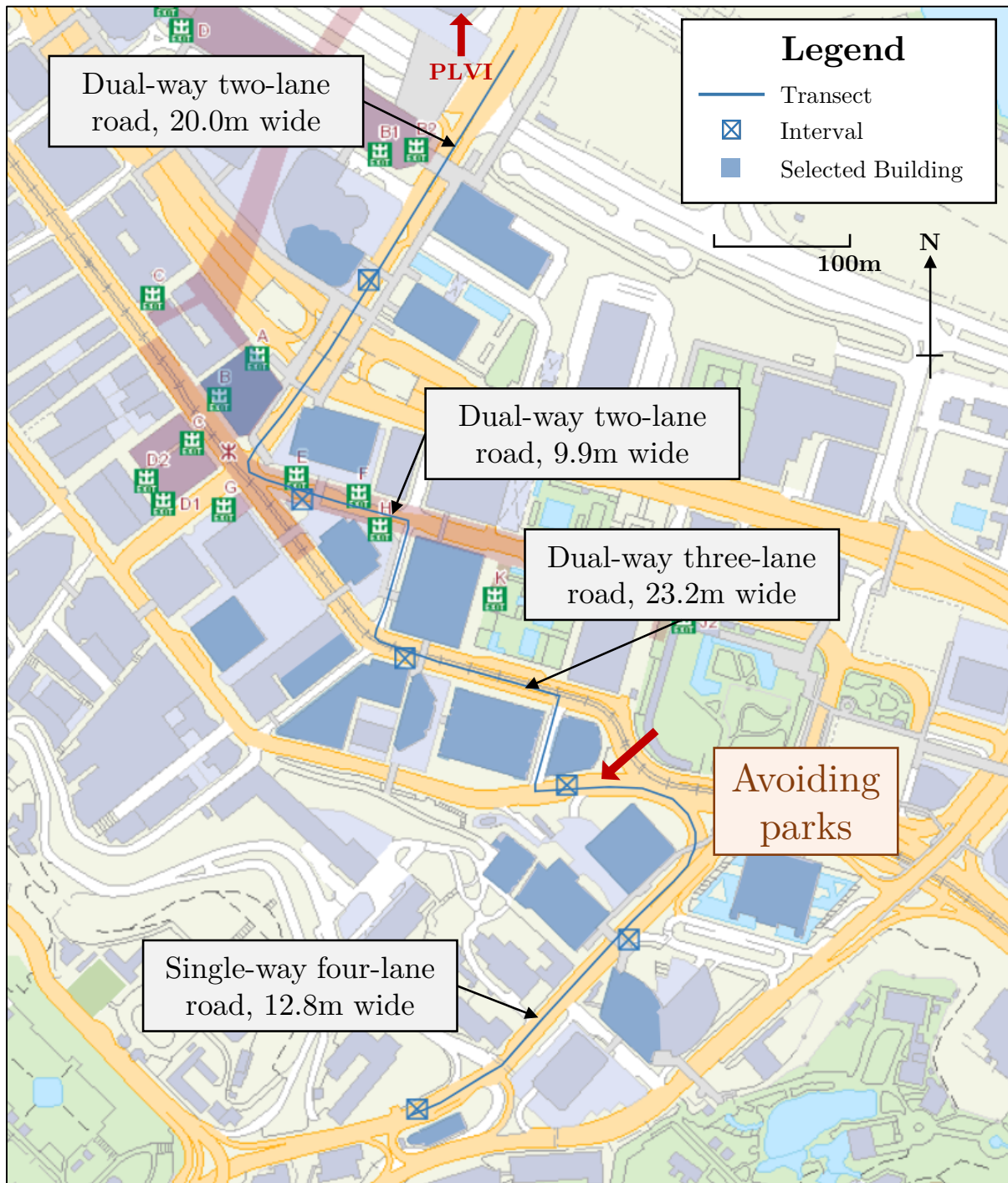
Map 4. Map of North transect (Lands Department; “HKMS 2.0”)

### 3.3.2 East Transect



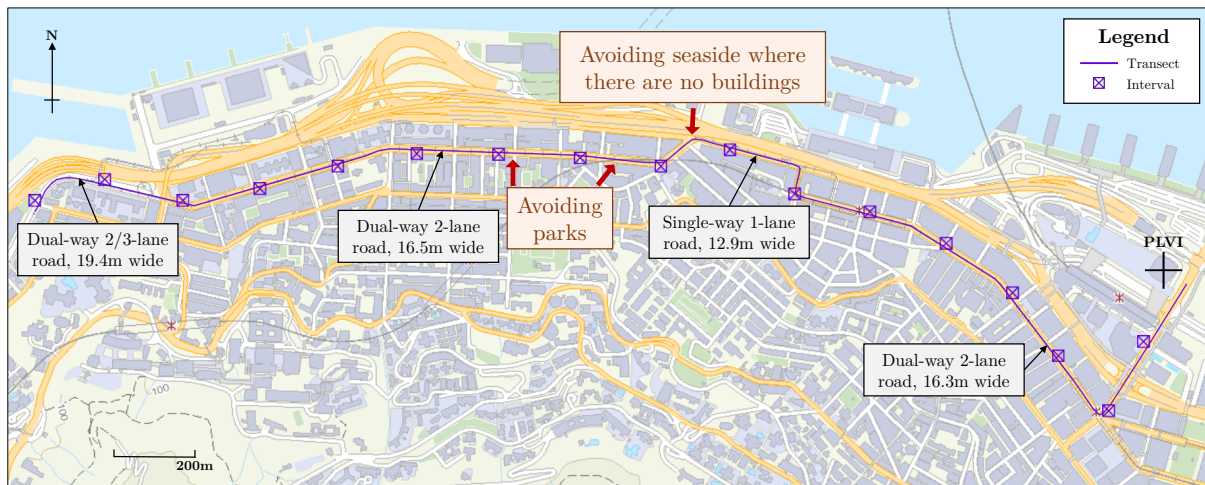
Map 5. Map of East transect (Lands Department; “HKMS 2.0”)

### 3.3.3 South Transect



Map 6. Map of South transect (Lands Department; “HKMS 2.0”)

### 3.3.4 West Transect



Map 7. Map of West transect (Lands Department; "HKMS 2.0")

### 3.4 Statistical Analysis Methods

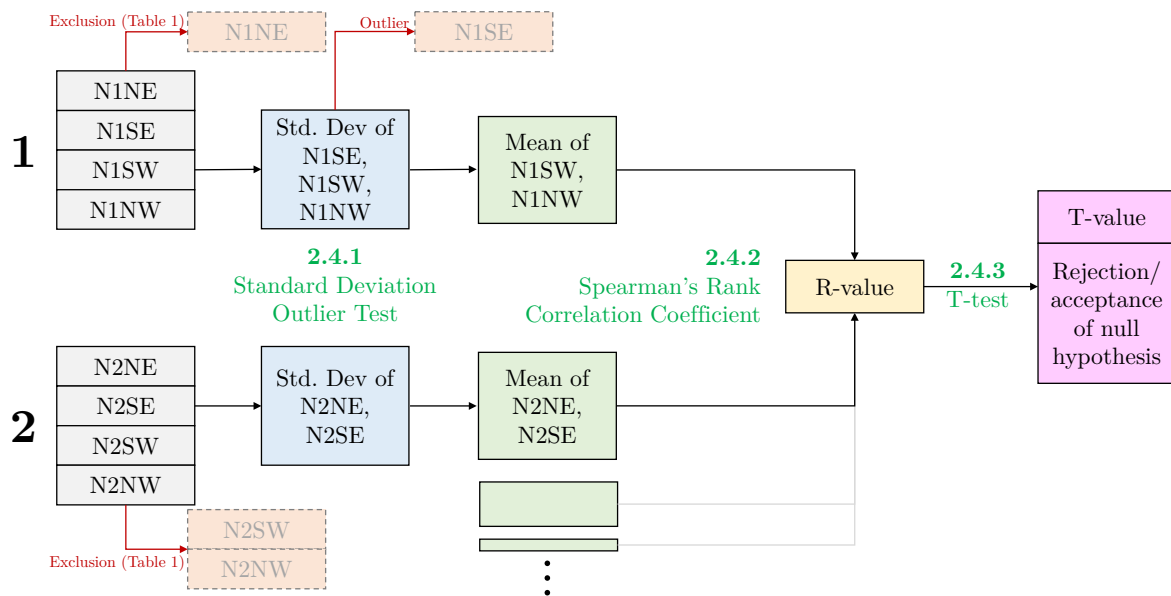


Figure 9. Overview of the general flow of data analysis.

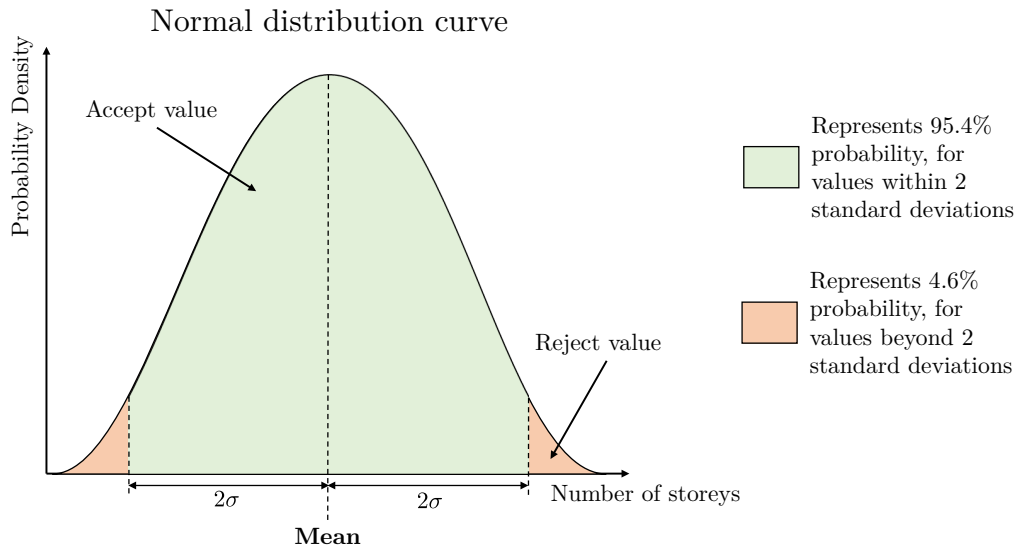
#### 3.4.1 Standard Deviation Outlier Test

To identify and remove outliers of data, the standard deviation of the four buildings must first be calculated:

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{n}} \quad (3.4.1.1)$$

From Equation 3.4.1.1, values exceeding  $2\sigma$  from the mean ( $\bar{x}$ ) will be considered as an outlier, as shown below:





**Figure 10.** Determination of whether a value should be accepted or rejected based on the standard deviation.

### 3.4.2 Spearman's Rank Correlation Coefficient (SRCC) Test

A SRCC test is used to determine the magnitude of correlation between two variables. This is particularly useful in this study as it is insensitive to outliers and produces an accurate measure of correlation for non-linear relationships (Lovie).

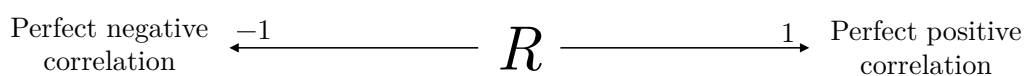
The SRCC is given by:

$$R = 1 - \frac{6 \sum d^2}{n^3 - n} \quad (3.4.2.1)$$

where  $d = r(x) - r(y)$ , as detailed below:

Distance from PLVI, $x$	Rank by increasing order Rank of $x$ , $r(x)$	Storeys, $y$	In case of same ranks, take its average Rank of $y$ , $r(y)$	Difference, $d$	$d^2$
0	0	69	5	-5	25
200	1	58	3.4 3.5	-2.5	6.25
400	2	58	3.4 3.5	-1.5	2.25
600	3	47	2	1	1
800	4	36	1	3	9
				<b>Sum, <math>\sum d^2</math></b>	<b>43.5</b>

**Figure 11.** A table for calculating  $\sum d^2$  from the distance from PLVI and the number of storeys.



**Figure 12.** A general interpretation of the correlation based on the SRCC.

### 3.4.3 T-test

To quantify the interpretation shown in Figure 12, and to judge whether the null hypothesis shall be rejected, the  $t$ -value must first be found:

$$t = R\sqrt{\frac{n-2}{1-R^2}} \quad (3.4.3.1)$$

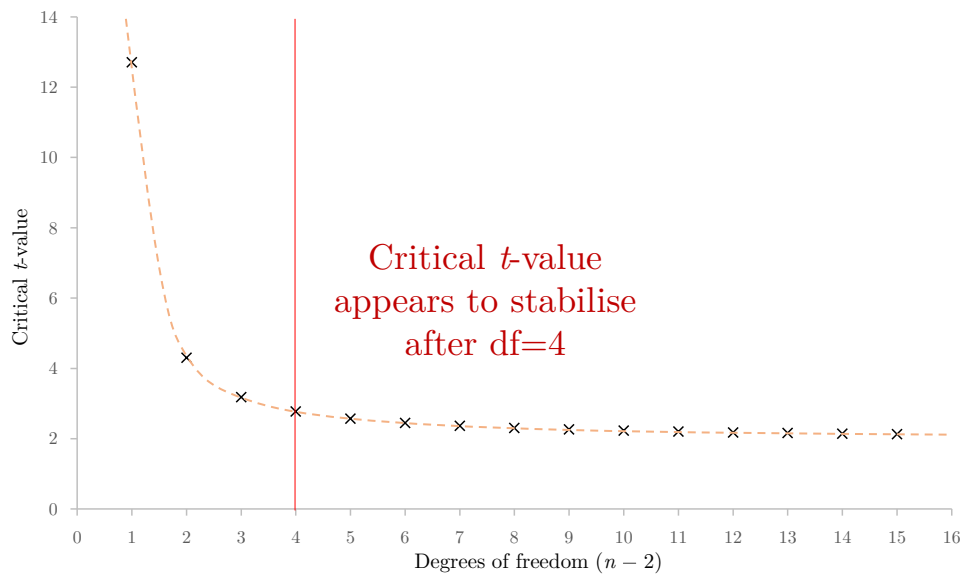
This  $t$ -value will then be checked against a  $t$ -table:

Degrees of freedom (df)	Critical $t$ -value ( $\alpha = 0.05$ )
1	12.706
2	4.303
3	3.182
4	2.776
5	2.571
6	2.447
7	2.365
8	2.306

**Table 2.** A  $t$ -table for  $\alpha = 0.05$ .

If the  $t$ -value calculated is above the critical  $t$ -value, the null hypothesis should be rejected.

### 3.4.4 Justification of interval length



**Figure 13.** A plot of the critical  $t$ -value against the degrees of freedom for  $\alpha = 0.05$ .

For the data to be statistically significant, its  $t$ -value must be sufficiently low. From Figure 13, this starts to happen when  $df \geq 4$ , meaning that at least 6 samples will be needed.

According to Centadata, only 6.34% of buildings are located above 100m AMSL, therefore, when connecting a line from the PLVI and to its first contact with a 100m contour line, its

distance is 1.15km. Hence, the maximum interval distance is  $\frac{1150}{6} = 191.6\text{m}$ , therefore, a 200m interval is chosen.

### 3.5 Secondary Data Gathering Techniques

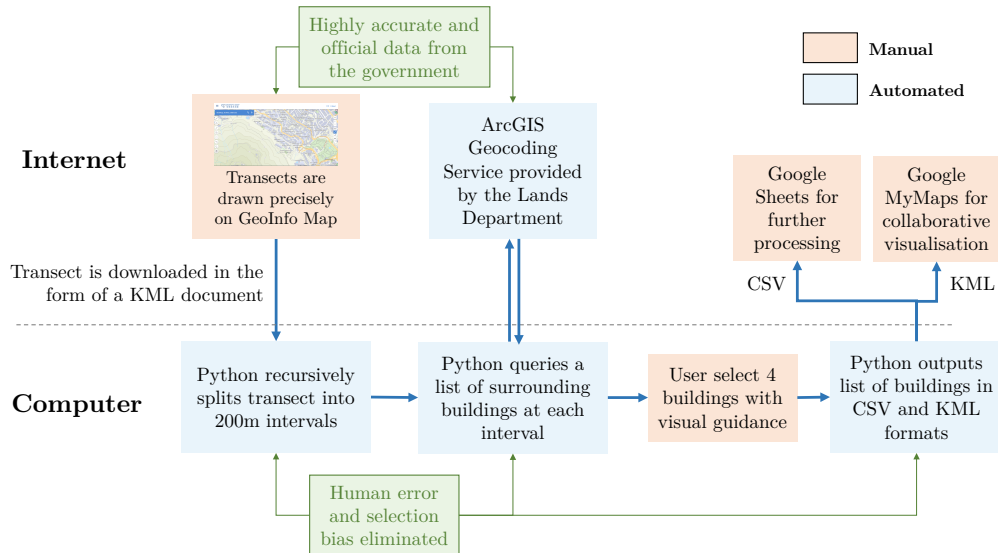


Figure 14. A flowchart describing the process of selecting buildings with the help of automation, mainly using Python, a programming language. (“HKMS 2.0”)

### 3.6 Calculation of Individual Transects

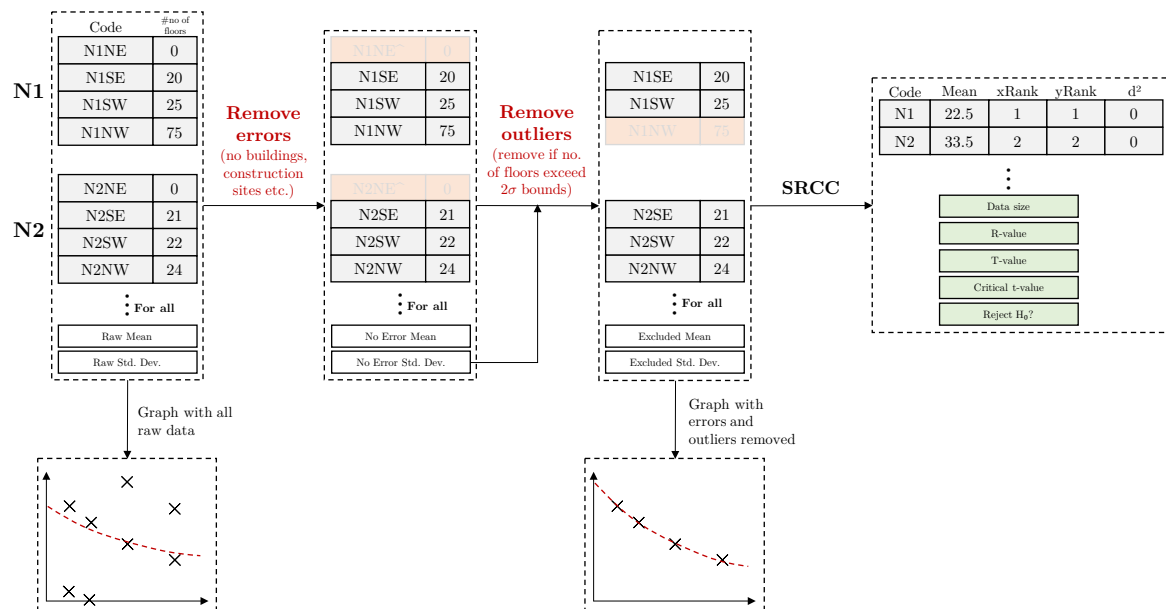


Figure 15. A flowchart outlining the general process of calculating data for the individual transects.

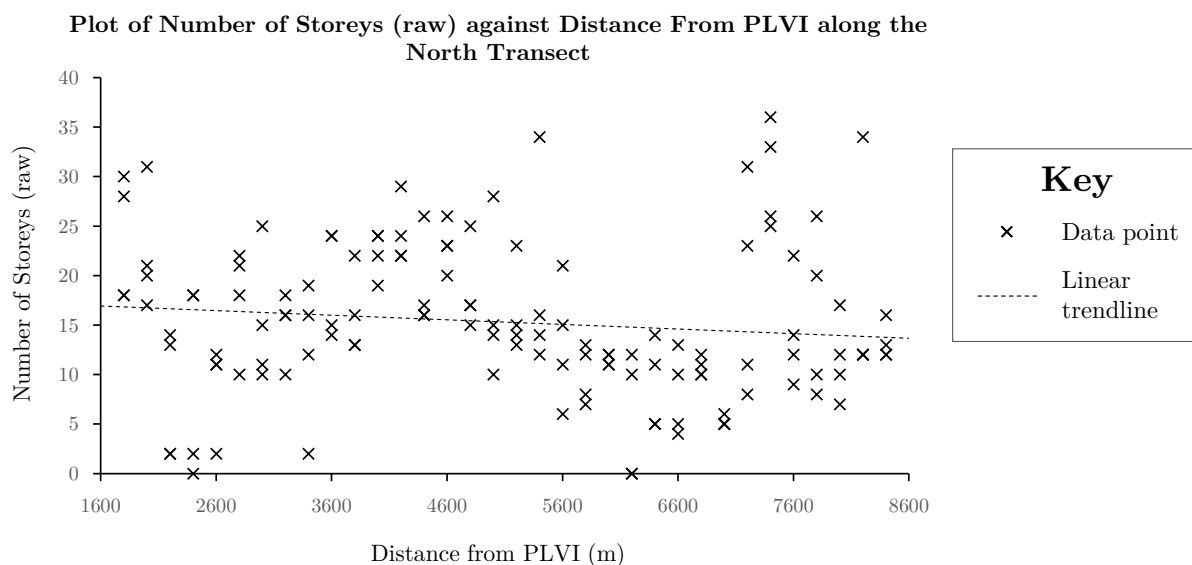


## 4 Data Presentation

All raw and processed data in a tabular format can be found in Appendix 9.1. A scatter graph showing all data points have been used, as it allows the identification of outliers to be easy. To aid with the process of data interpretation, a linear line of best fit has also been added to the scatter graph to better highlight the correlation between the two variables.

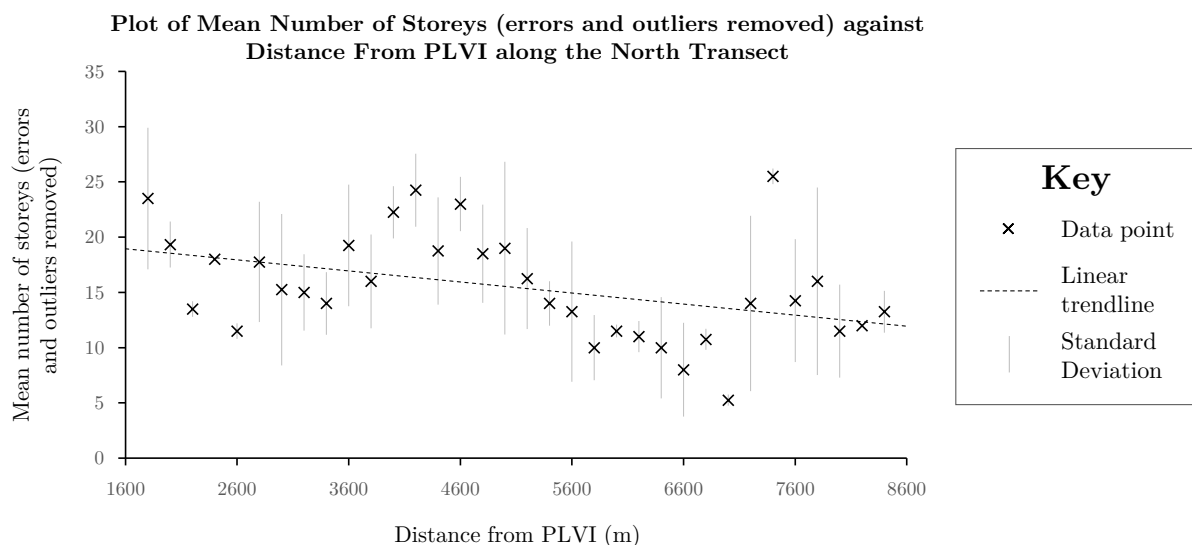
### 4.1 North Transect

#### 4.1.1 Raw Data Graph



**Figure 17.** A scatter plot of the raw number of storeys against the distance from the PLVI, along the north transect.

#### 4.1.2 Processed Data Graph



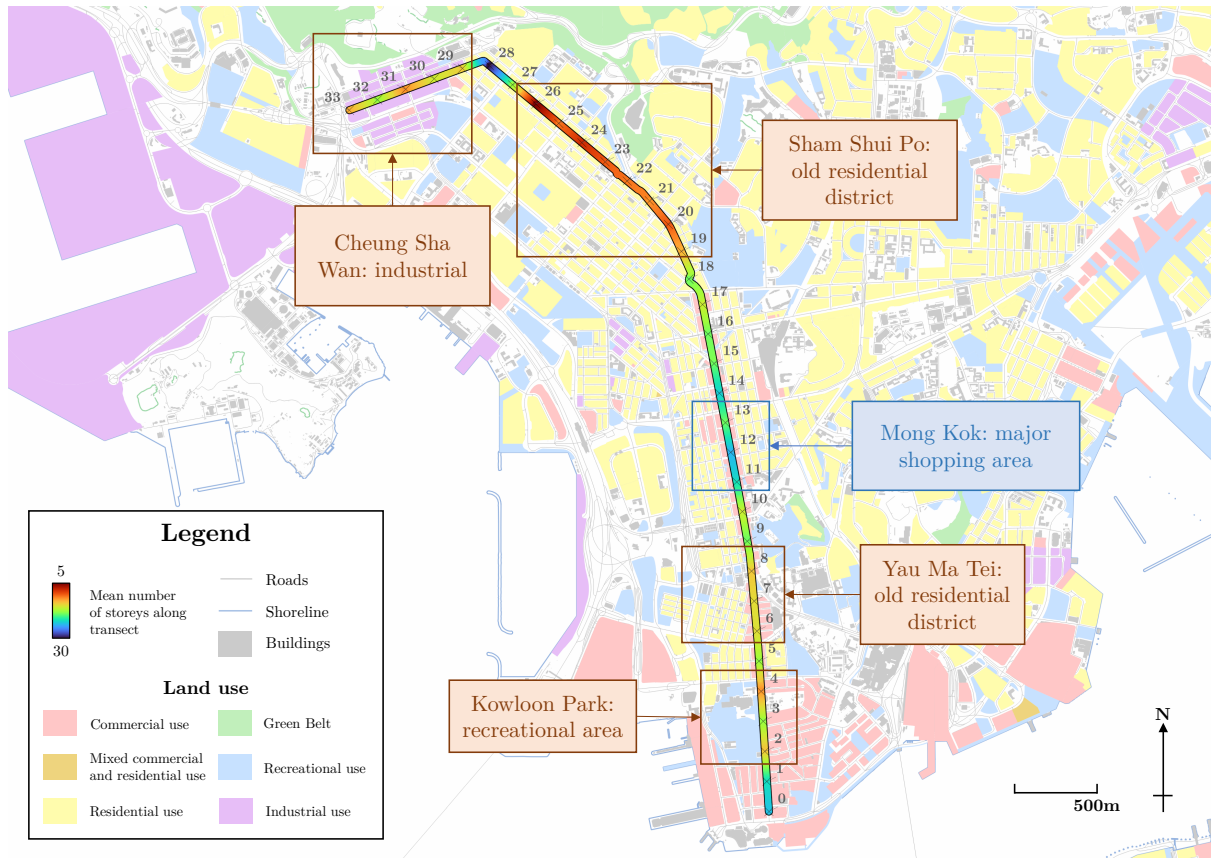
**Figure 18.** A scatter plot of the mean number of storeys, with errors and outliers removed, against the distance from the PLVI, along the north transect.

### 4.1.3 Summary Data Table

Mean number of storeys (Raw)	15.29	
Standard Deviation of Number of storeys (Raw)	7.73	
Mean number of storeys (No Errors)	16.33	
Standard Deviation of Number of storeys (No Errors)	7.086	
Upper range of number of storeys (No Errors)	15.47	
Lower range of number of storeys (No Errors)	6.111	
Mean number of storeys (No Errors or Outliers)	30.50	
Standard Deviation of number of storeys (No Errors or Outliers)	2.159	
R-value	-0.4566	← Indicates moderate negative correlation
<i>t</i> -value	2.903	} <i>t</i> -value lower than critical <i>t</i> -value, hence null hypothesis rejected
Critical <i>t</i> -value	2.037	
<i>t</i> -value > critical <i>t</i> -value / whether to reject H <sub>0</sub>	Yes	

**Table 3.** Summary table of calculated values for the North Transect.

#### 4.1.4 Land Use Zoning



Map 8. Map of the North Transect (Hong Kong Geodata Store, Planning Department).

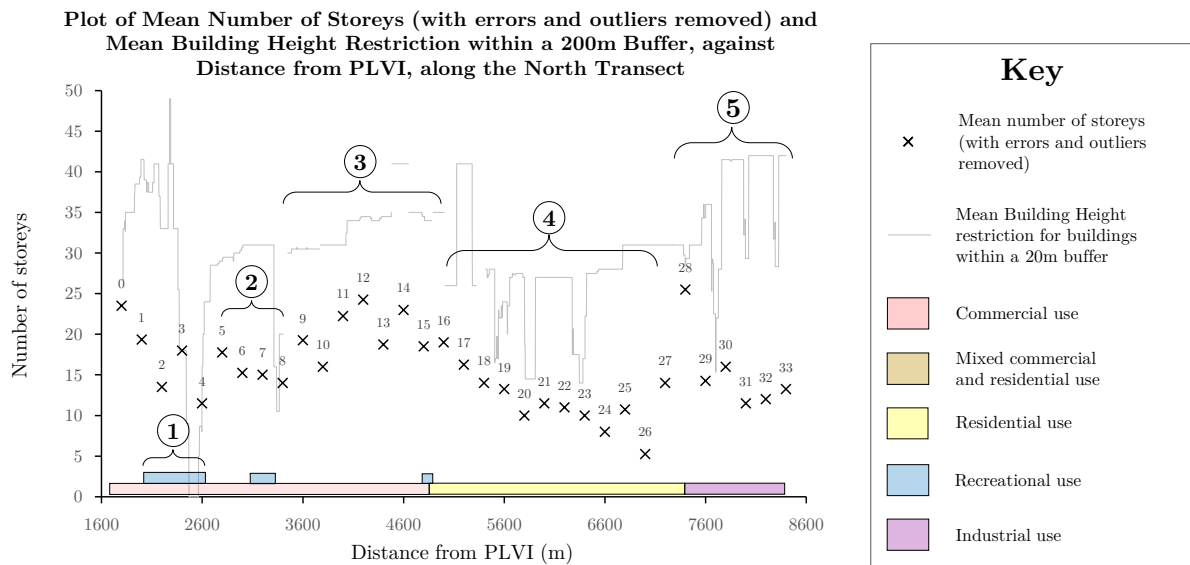


Figure 19. A scatter plot of the mean number of storeys, with errors and outliers removed and the mean building height restriction with a 200m buffer, against the distance from the PLVI, along the North transect. (Lands Department, Planning Department)

In Figure 19, the land use generally transitions from commercial use, with a greater building height, to residential use, with a lower building height, similar of the Burgess Model.

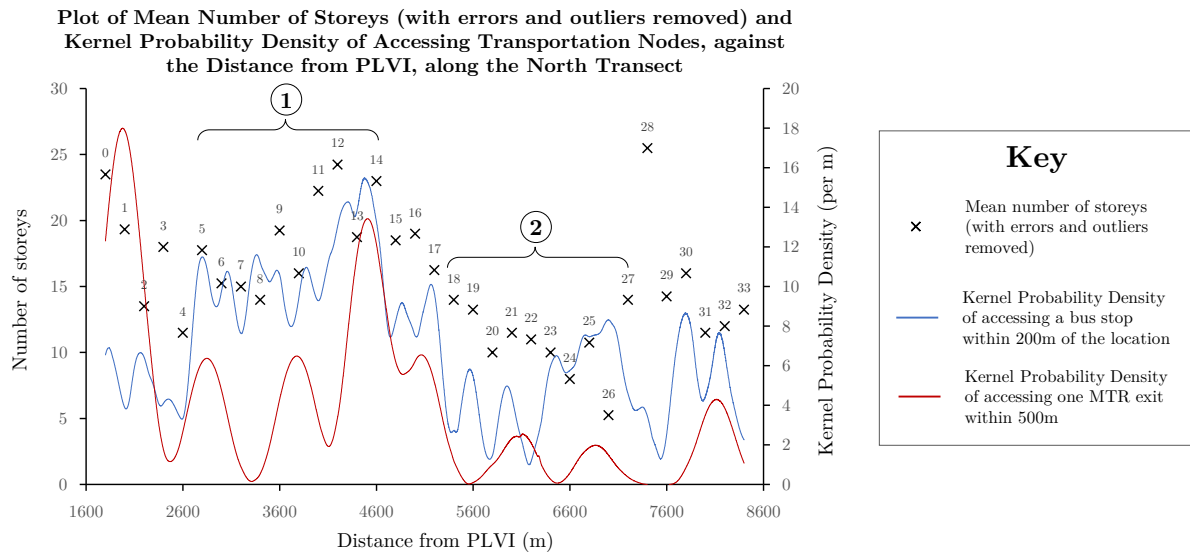
Since ③ is a major shopping area, it attracts many commercial businesses, raising the land competition and resulting in a secondary PLVI.

Anomalies include:

- ①, which is adjacent to recreational areas such as Kowloon Park that are designed specifically with low building height to maximise the sense of greenery.
- As redevelopment works is a time-consuming process, old residential neighbourhoods such as ② and ④ remain with low building heights.
- As industrial areas require large working areas, it often leads to slightly taller buildings, as observed in ⑤.



### 4.1.5 Transport

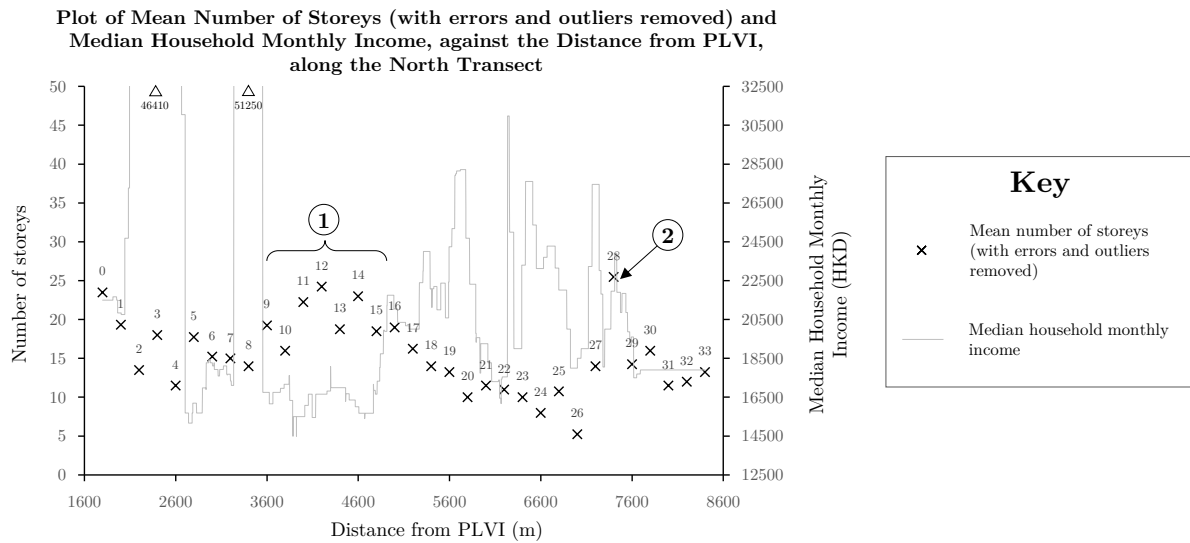


**Figure 20.** A scatter plot of the mean number of storeys, with errors and outliers removed and the kernel probability density of accessing transport nodes, against the distance from the PLVI, along the North transect. (Lands Department)

In ①, the accessibility to bus stops and MTR exits are exceptionally high. The height of the buildings is also very high, which can be explained by the fact that shopping centres and commercial complexes in the Mong Kok area attracts and generates large amounts of traffic, including office workers, tourists and residents.

Conversely, as the distance from the PLVI increases, the transport accessibility decreases, as shown in ②. Hence, the data above generally fits the Burgess Model, where areas further from the PLVI likely will experience poorer accessibility.

#### 4.1.6 Socio-economic



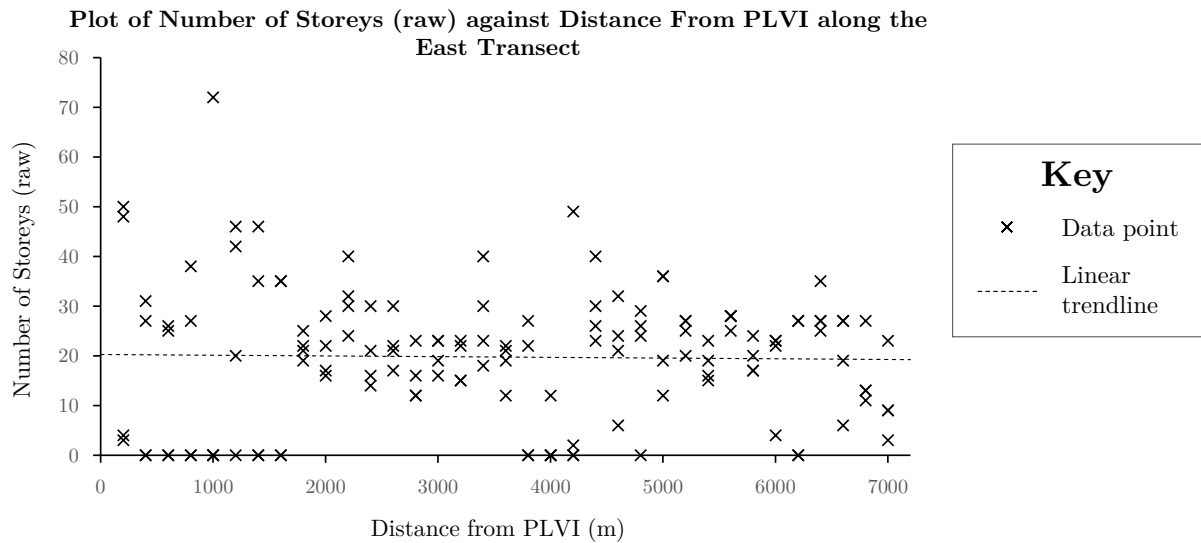
**Figure 21.** A scatter plot of the mean number of storeys, with errors and outliers removed and the median household monthly income, against the distance from the PLVI, along the North transect. (Census and Statistics Department)

In ①, although buildings are generally high, the household income is observed to be low. This can be explained in Map 8, where the commercial area is mainly built along the Nathan Road, where accessibility is high, and surrounded by older residential buildings. This possesses a highly similar trait to the Hoyt Model, where industrial and commercial buildings are built along a major transport link, and low-class residential areas surround them.

At ②, the spike in household income closely matches with the anomaly in building height, which can be explained by gentrification, improving the quality of life, household income and ultimately the land value.

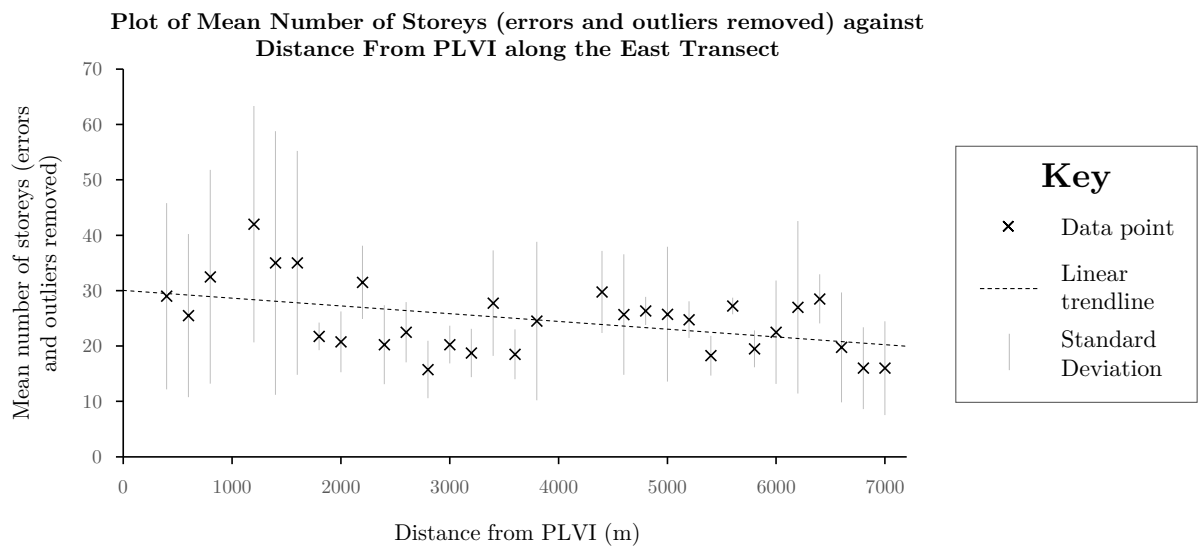
## 4.2 East Transect

### 4.2.1 Raw Data Graph



**Figure 22.** A scatter plot of the raw number of storeys against the distance from the PLVI, along the east transect.

### 4.2.2 Processed Data Graph



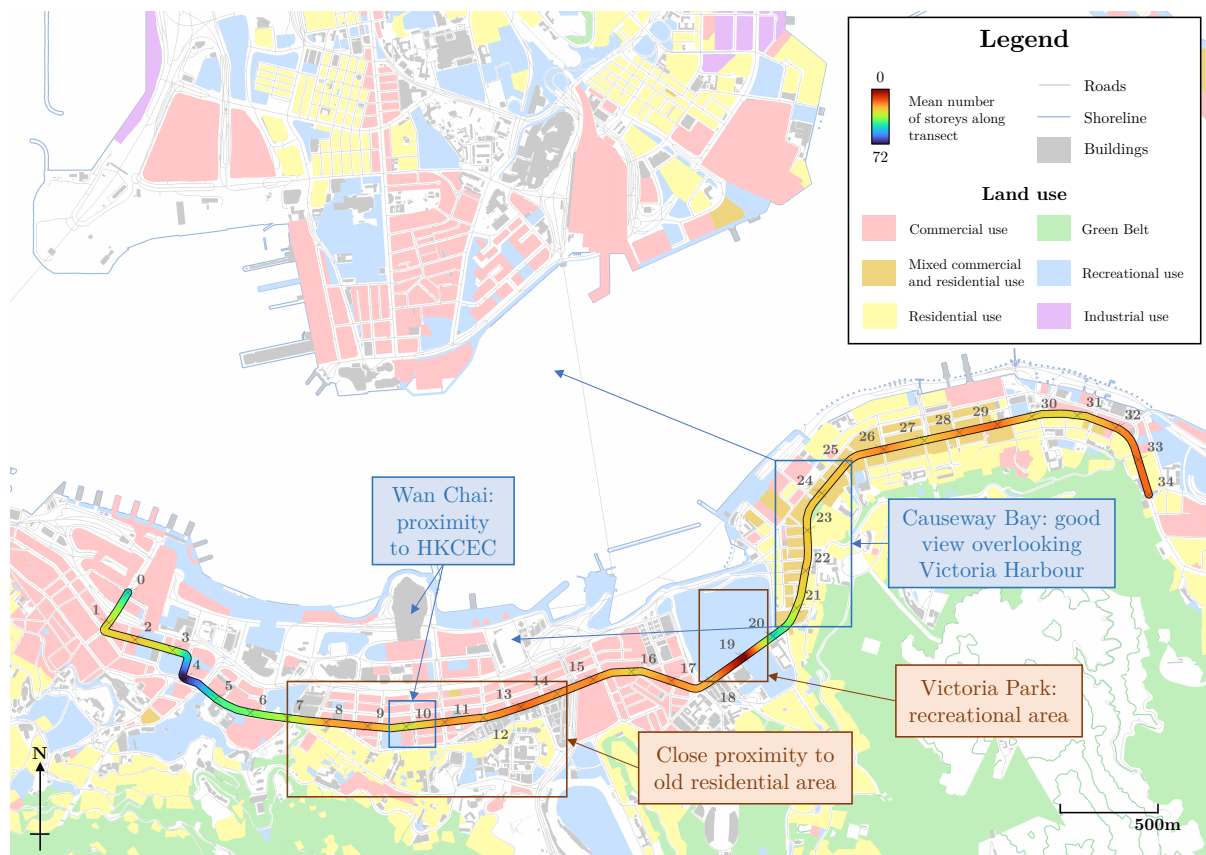
**Figure 23.** A scatter plot of the mean number of storeys, with errors and outliers removed, against the distance from the PLVI, along the east transect.

### 4.2.3 Summary Data Table

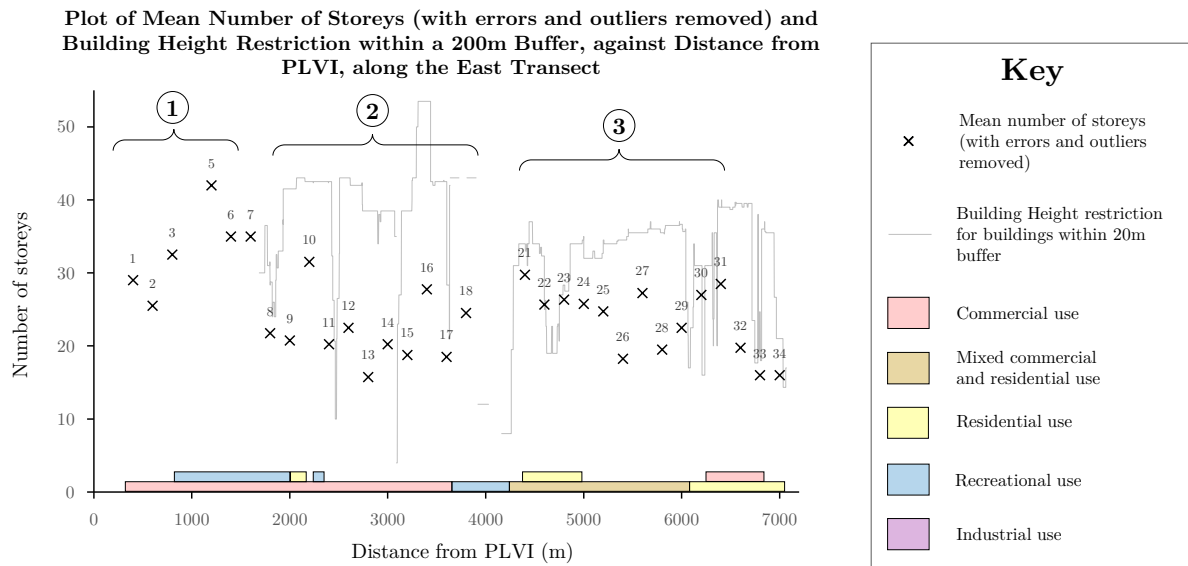
Mean number of storeys (Raw)	19.88	
Standard Deviation of Number of storeys (Raw)	13.25	
Mean number of storeys (No Errors)	24.96	
Standard Deviation of Number of storeys (No Errors)	10.07	
Upper range of number of storeys (No Errors)	23.55	
Lower range of number of storeys (No Errors)	7.273	
Mean number of storeys (No Errors or Outliers)	45.11	
Standard Deviation of number of storeys (No Errors or Outliers)	4.81	
R-value	-0.4254	Indicates moderate negative correlation
$t$ -value	2.531	$t$ -value lower than critical $t$ -value, hence null hypothesis rejected
Critical $t$ -value	2.045	
$t$ -value > critical $t$ -value / whether to reject $H_0$	Yes	

**Table 4.** Summary table of calculated values for the East Transect.

### 4.2.4 Land Use Zoning



**Map 9.** Map of the east transect (Hong Kong Geodata Store, Planning Department).



**Figure 24.** A scatter plot of the mean number of storeys, with errors and outliers removed and the mean building height restriction with a 200m buffer, against the distance from the PLVI, along the East transect. (Lands Department, Planning Department)

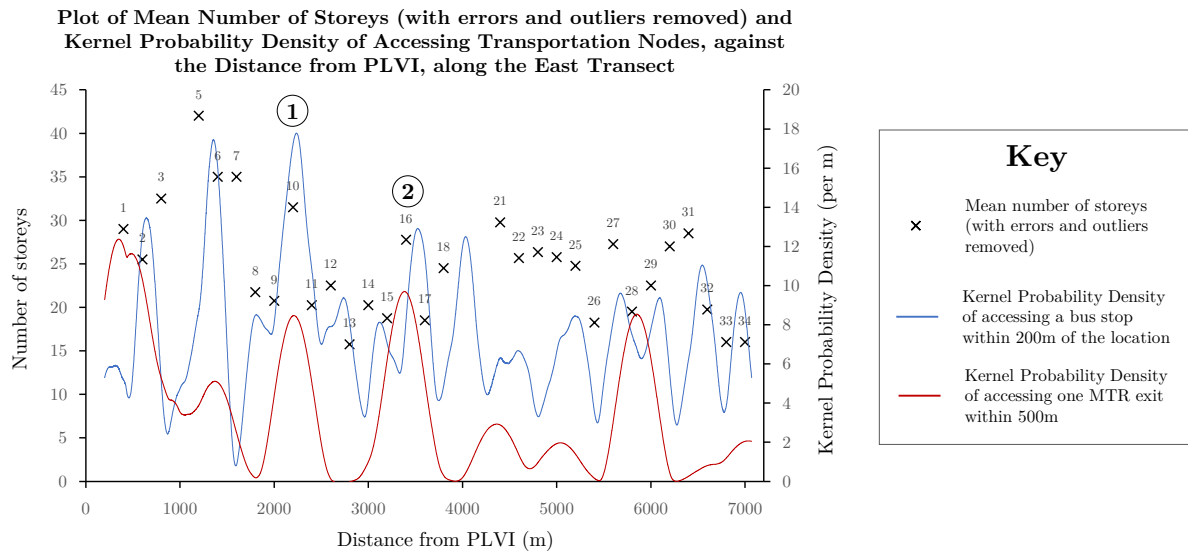
In ①, as there are no building height restrictions, large transnational companies and enterprises have a large benefit to build tall buildings to increase their profits.

In ②, as the distance from the PLVI increases, the competition for space decreases, leading to lower building heights. In addition, as demonstrated in Map 9, because of the close proximity to an old residential area, land estate developers may view the area as an impoverished area, hence dropping the land value of the area.

However, in ②, the building height is slightly taller. As outlined in Map 9, these residential buildings have a good overlooking view of the Harbour, attracting land estate developers to construct taller buildings to gain a better view, in order to earn more rent.

Overall, due to the shift in land use from heavily contested commercial areas to residential areas, as predicted by the Burgess model, a significant negative correlation between the building height and distance has been observed.

## 4.2.5 Transport

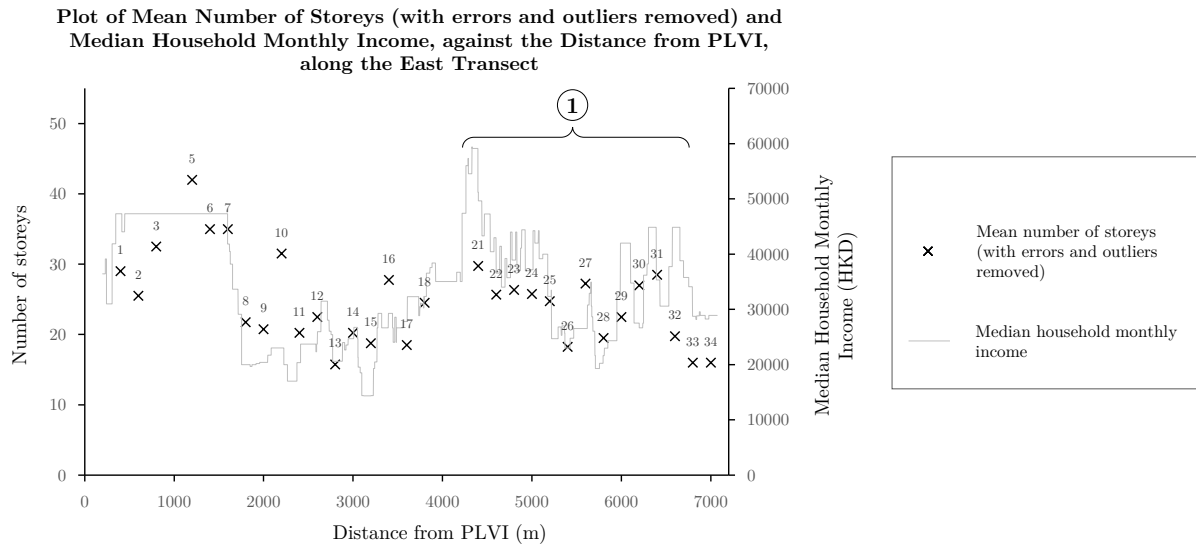


**Figure 25.** A scatter plot of the mean number of storeys, with errors and outliers removed and the kernel probability density of accessing transport nodes, against the distance from the PLVI, along the East transect. (Lands Department)

As seen from above, the accessibility of MTR exits and bus stops generally matches with the building height. This explains some anomalies in building heights, especially at ① and ②. At ①, it is in close proximity to the Hong Kong Conventional Exhibition Centre, which often hosts domestic and international large-scale events. In order to cope with large influxes of movements, the area has a very high accessibility, raising the land value and increasing the building height. Similarly, as multiple high-volume buildings such as department stores are located at ②, the clustering of transport infrastructure occurs, again raising the land value.

However, as the distance increases, the accessibility generally decreases along with the building height, hence supporting the distance decay concept of the Burgess model.

## 4.2.6 Socio-economic

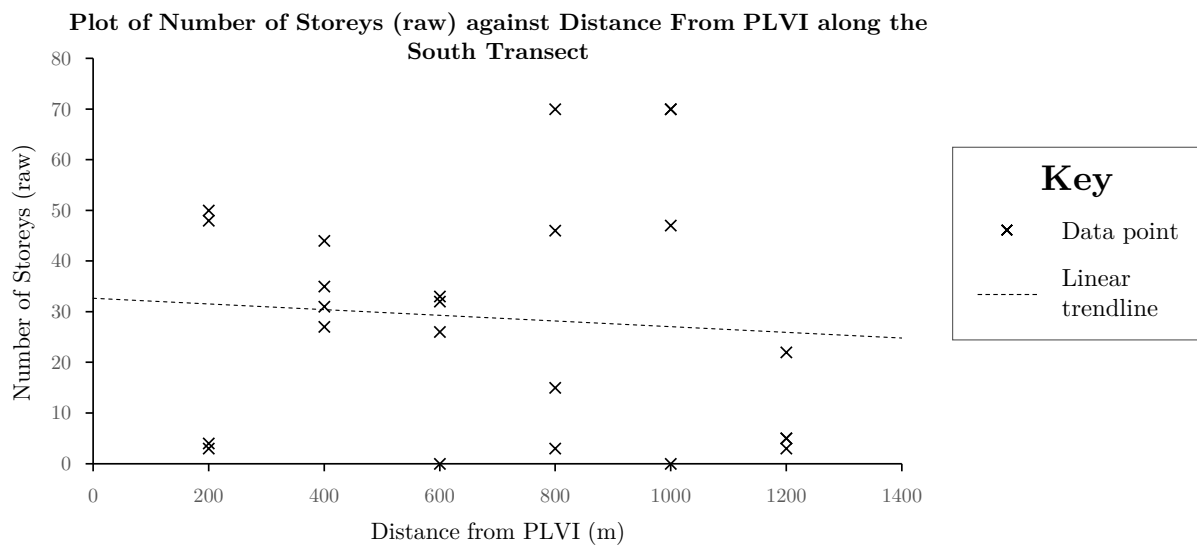


**Figure 26.** A scatter plot of the mean number of storeys, with errors and outliers removed and the median household monthly income, against the distance from the PLVI, along the East transect.  
(Census and Statistics Department)

In ①, both the monthly income and the building height decreases steadily. As the distance from the PLVI increases, the availability of space at a lower price is increasingly abundant. Hence, people with less income are more likely to sacrifice accessibility for lower prices and reside farther from the PLVI. As seen from the graph, this phenomenon is significant, supporting the bid-rent theory.

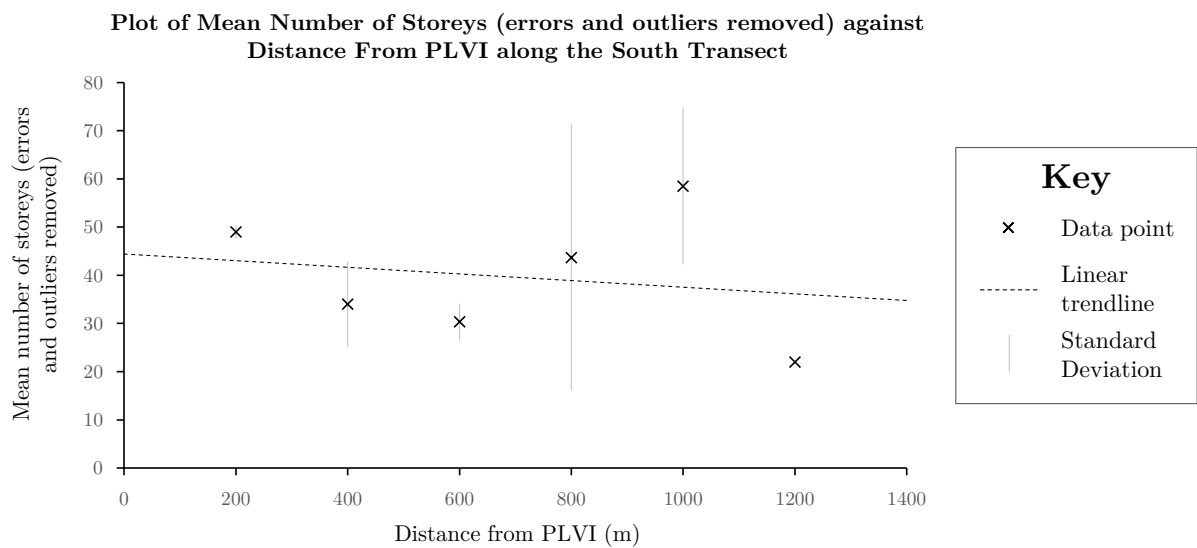
### 4.3 South Transect

#### 4.3.1 Raw Data Graph



**Figure 27.** A scatter plot of the raw number of storeys against the distance from the PLVI, along the south transect.

#### 4.3.2 Processed Data Graph



**Figure 28.** A scatter plot of the mean number of storeys, with errors and outliers removed, against the distance from the PLVI, along the south transect.



### 4.3.3 Summary Data Table

Mean number of storeys (Raw)	28.71	
Standard Deviation of Number of storeys (Raw)	23.30	
Mean number of storeys (No Errors)	40.07	
Standard Deviation of Number of storeys (No Errors)	16.58	
Upper range of number of storeys (No Errors)	40.07	
Lower range of number of storeys (No Errors)	16.58	
Mean number of storeys (No Errors or Outliers)	73.23	
Standard Deviation of number of storeys (No Errors or Outliers)	6.91	
R-value	-0.2571	Indicates weak negative correlation
<i>t</i> -value	0.5322	} <i>t</i> -value lower than critical <i>t</i> -value, hence null hypothesis accepted
Critical <i>t</i> -value	2.776	
<i>t</i> -value > critical <i>t</i> -value / whether to reject H <sub>0</sub>	No	

**Table 5.** Summary table of calculated values for the South Transect.

### 4.3.4 Land Use Zoning

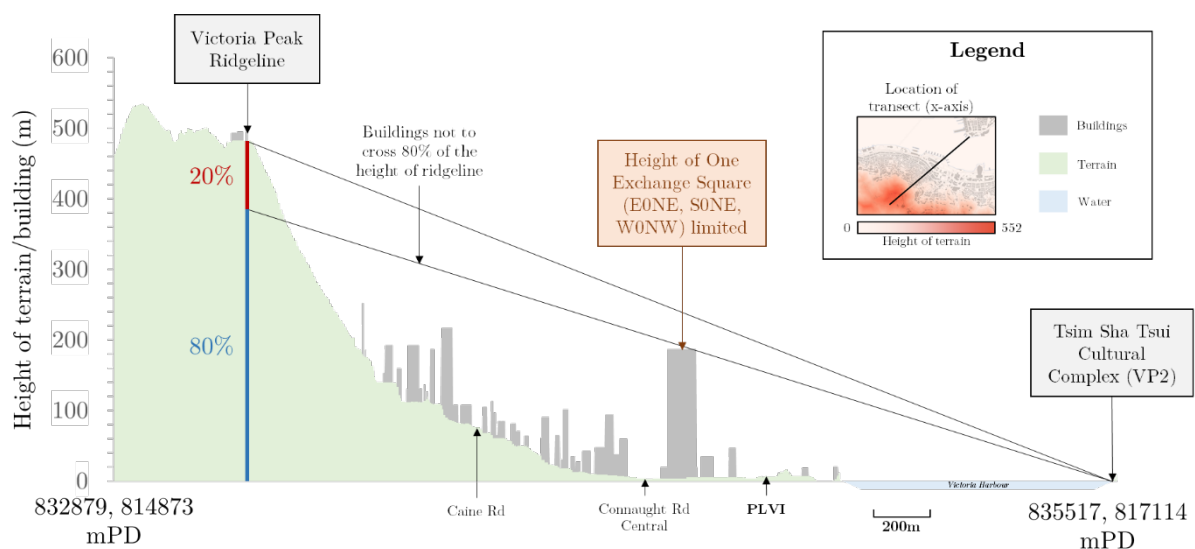


**Map 10.** Map of the south transect (Hong Kong Geodata Store, Planning Department).

Due to the lack of buildings on the mountainous terrain south of the transect, the length of the transect is severely limited. Because of insufficient data, the magnitude of correlation will be unreliable, therefore a detailed analysis of the area from a transportation and socio-economic perspective will not be performed.

Regardless, S2 is adjacent to Charter Garden, which is an area for open space and greenery. According to the Hong Kong Planning Standards and Guidelines (HKPSG), new developments surrounding the area should “integrate” with the greenery to provide adequate air circulation and breathability, causing areas around open spaces to generally have lower building heights.

Additionally, S5 is adjacent to the Former French Mission Building, which is a historical monument protected by law that prevents any alterations to the building. In order to protect the setting of the historical monument, new developments are also required to “lower” and “respect” the building height of the surrounding historical monument (HKPSG), leading areas around it to have lower building heights.



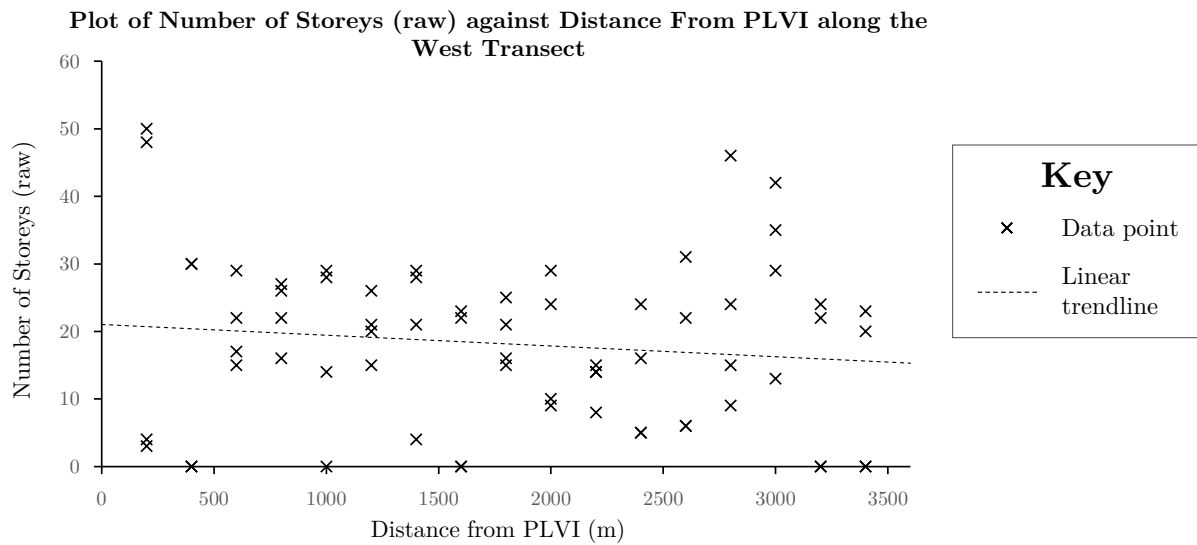
**Figure 29.** A depiction of topography and urban design guidelines being a limiting factor to horizontal sprawl. (RMJM Limited and Planning Department, Lands Department)

Additionally, as the HKPSG states, buildings must not rise above 80% of the height of specific ridgelines to maintain a good visual appearance at specific vantage points. As depicted by Figure 29, as the height restriction prevents buildings from rising above a specified level, it may have reduced the magnitude of the correlation, affecting the results.

Although it can be said that it is unsuitable for buildings and transportation infrastructure to be built on the steep gradient southward, and hence lead to the prevention of urban sprawl and hence lower building height, due to the small sample size and the large variability of the data, the null hypothesis is accepted.

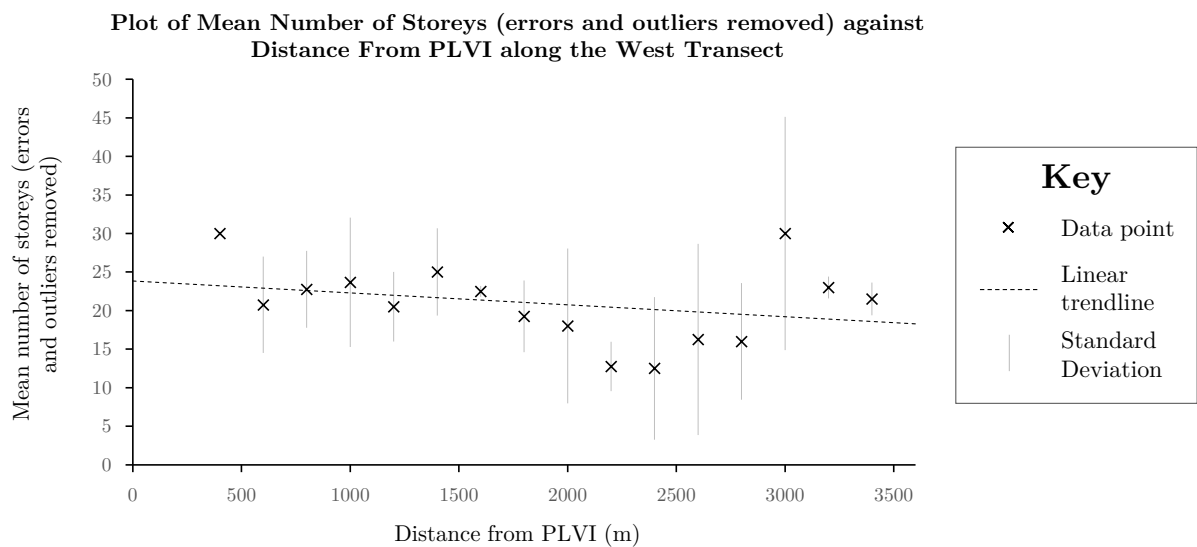
## 4.4 West Transect

### 4.4.1 Raw Data Graph



**Figure 30.** A scatter plot of the raw number of storeys against the distance from the PLVI, along the west transect.

### 4.4.2 Processed Data Graph

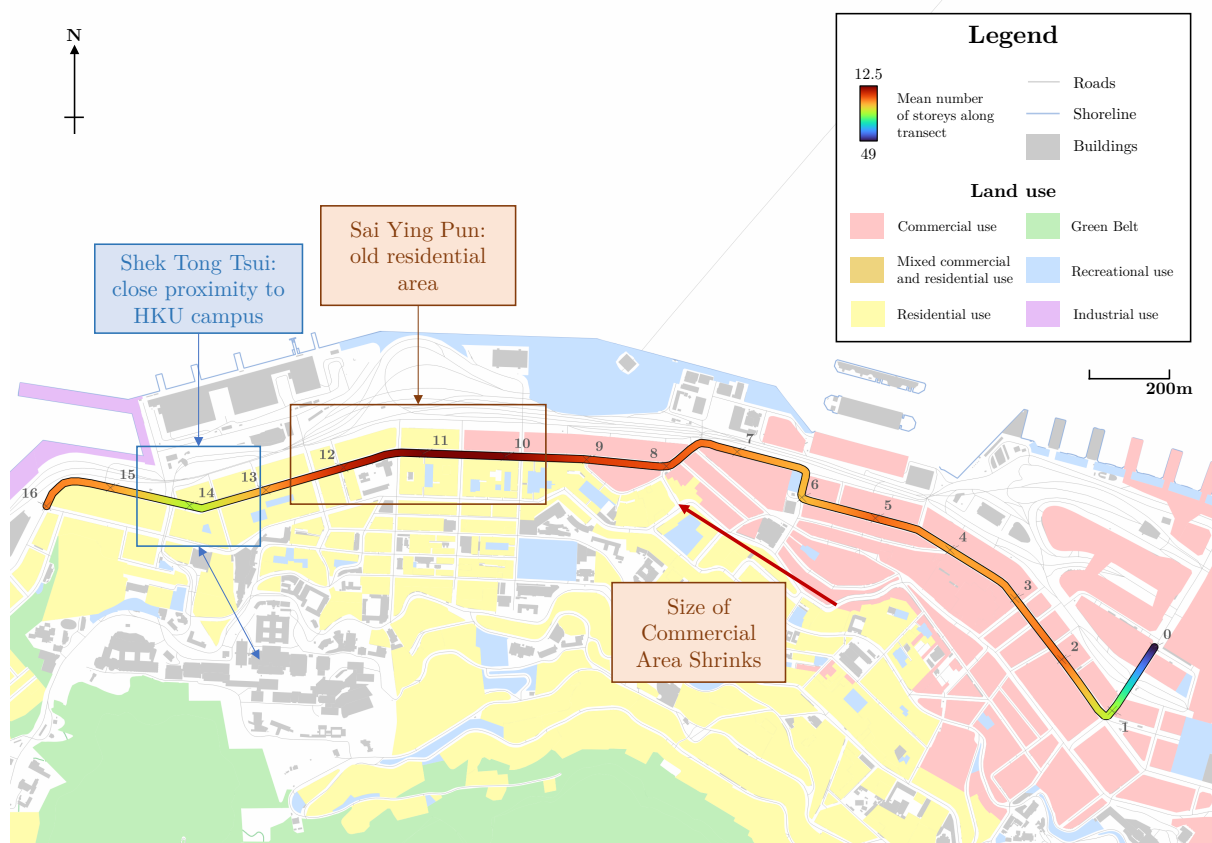


**Figure 31.** A scatter plot of the mean number of storeys, with errors and outliers removed, against the distance from the PLVI, along the west transect.

### 4.4.3 Summary Data Table

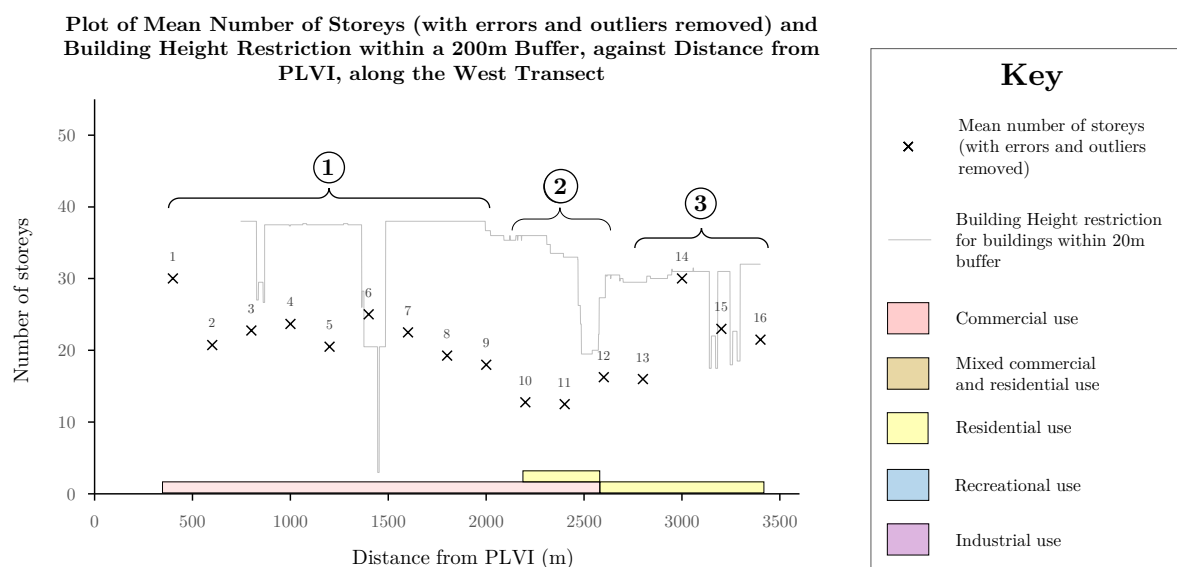
Mean number of storeys (Raw)	18.18	
Standard Deviation of Number of storeys (Raw)	12.23	
Mean number of storeys (No Errors)	21.63	
Standard Deviation of Number of storeys (No Errors)	10.24	
Upper range of number of storeys (No Errors)	20.08	
Lower range of number of storeys (No Errors)	8.168	
Mean number of storeys (No Errors or Outliers)	42.10	
Standard Deviation of number of storeys (No Errors or Outliers)	1.16	
R-value	-0.2890	Indicates weak negative correlation
<i>t</i> -value	1.129	<i>t</i> -value lower than critical <i>t</i> -value, hence null hypothesis accepted
Critical <i>t</i> -value	2.145	
<i>t</i> -value > critical <i>t</i> -value / whether to reject H <sub>0</sub>	No	

**Table 6.** Summary table of calculated values for the West Transect.



**Map 11.** Map of the west transect (Hong Kong Geodata Store, Planning Department).

#### 4.4.4 Land Use Zoning and Socio-economic



**Figure 32.** A scatter plot of the mean number of storeys, with errors and outliers removed and the mean building height restriction with a 200m buffer, against the distance from the PLVI, along the West transect. (Lands Department, Planning Department)

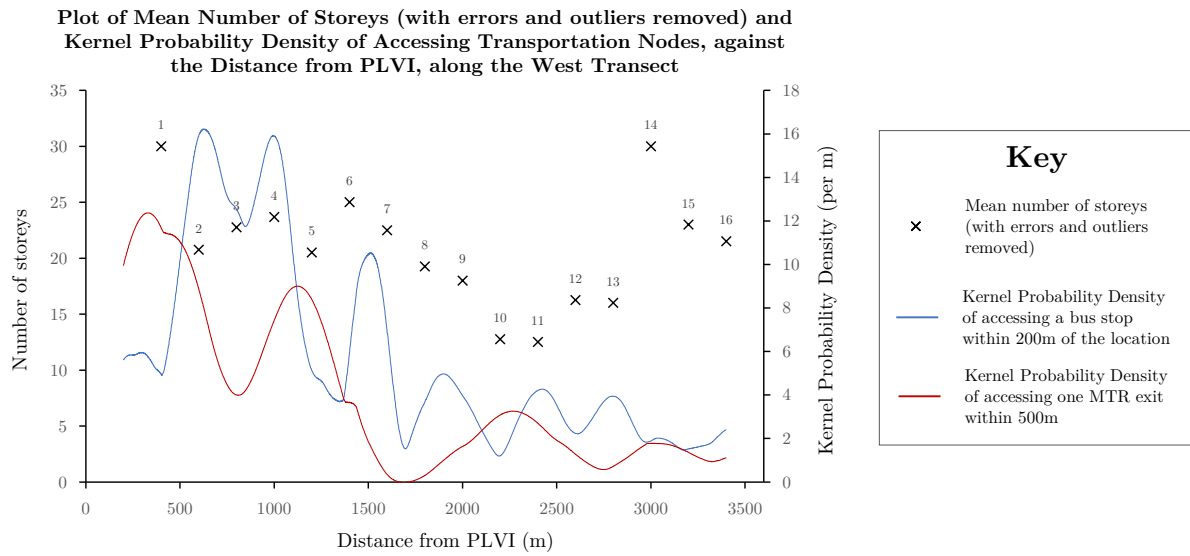
From Map 11 and Figure 32, in ①, the area is mainly used for commercial purposes, and as the distance increases, it gradually transitions to a residential area. The shrinking effect of the commercial area is most likely due to the sectoral shift from secondary sectors to tertiary sectors in the 1990s (Planning Department).

In ②, the land use is composed of mixed commercial and residential buildings, and located within Sai Ying Pun, one of the oldest still-operating historic commercial areas (W11 median year of completion: 1971). Since the land use changes are very subtle, the rate of building height descent is also lower, justifying the weak negative correlation and rejection of the alternative hypothesis.

However, at ③, due to the proximity to the Hong Kong University Campus, there is a high demand of services such as restaurants. This causes areas such as Shek Tong Tsui to undergo gentrification, attracting new businesses into the area, leading to an overall higher land value. To best utilise the land, developers began developing vertically, leading to new developments (W14) to construct buildings that are barely below the height restriction (see Figure 32).

Therefore, it can be said that the West Transect exhibits many shared properties with the Burgess Model.

#### 4.4.5 Transport

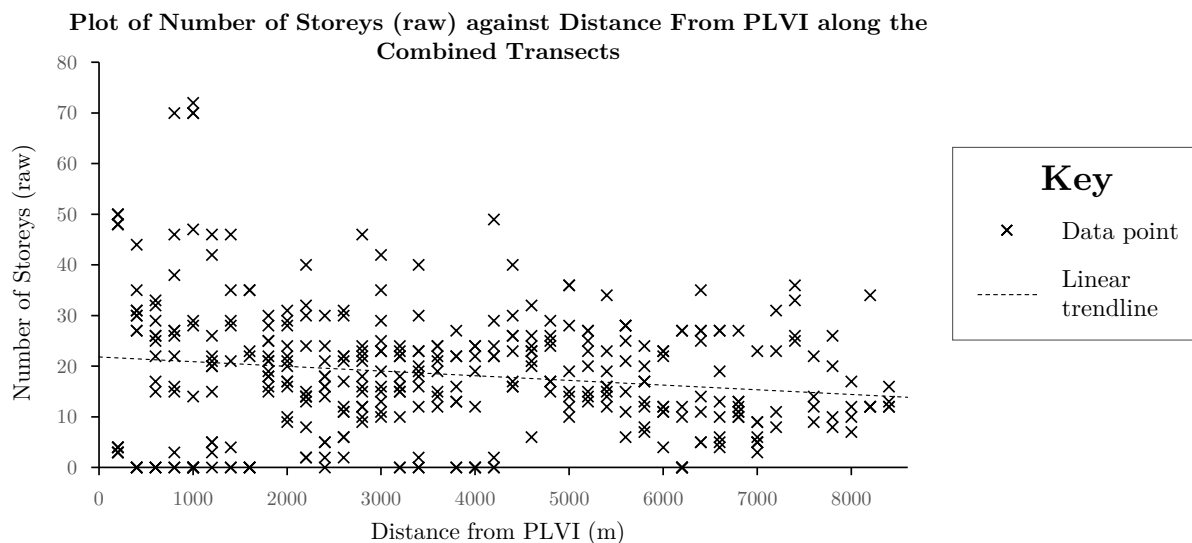


**Figure 33.** A scatter plot of the mean number of storeys, with errors and outliers removed and the kernel probability density of accessing transport nodes, against the distance from the PLVI, along the West transect. (Lands Department)

From above, it is clear that the accessibility decreases as distance increases, as residential areas farther from the PLVI do not generate much demand. This once again confirms the applicability of the distance decay concept to the West Transect.

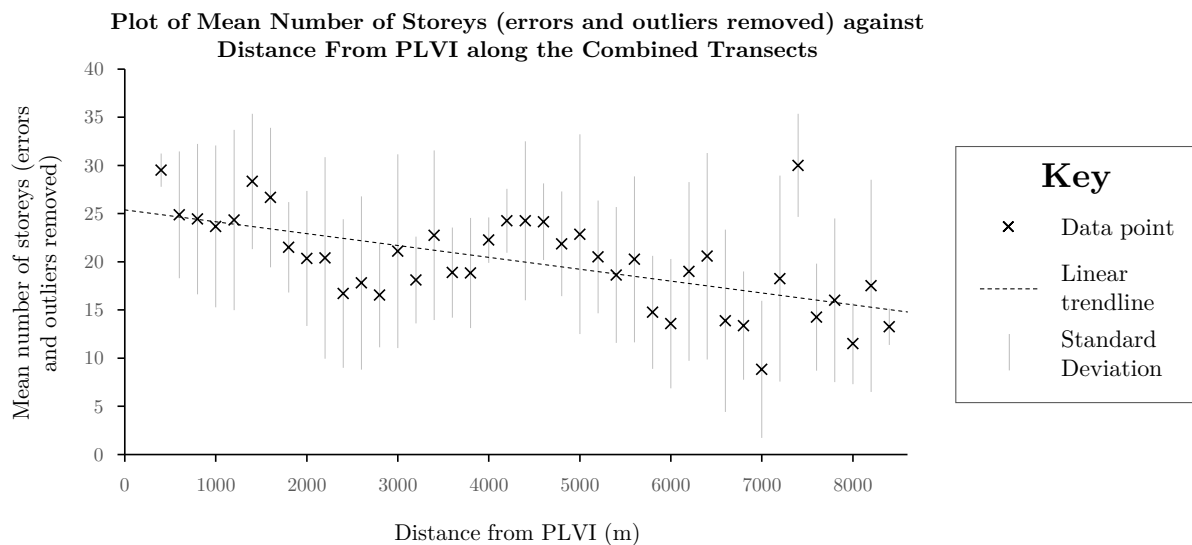
## 4.5 Combined Transects

### 4.5.1 Raw Data Graph



**Figure 34.** A scatter plot of the raw number of storeys against the distance from the PLVI, along the combined transects.

### 4.5.2 Processed Data Graph

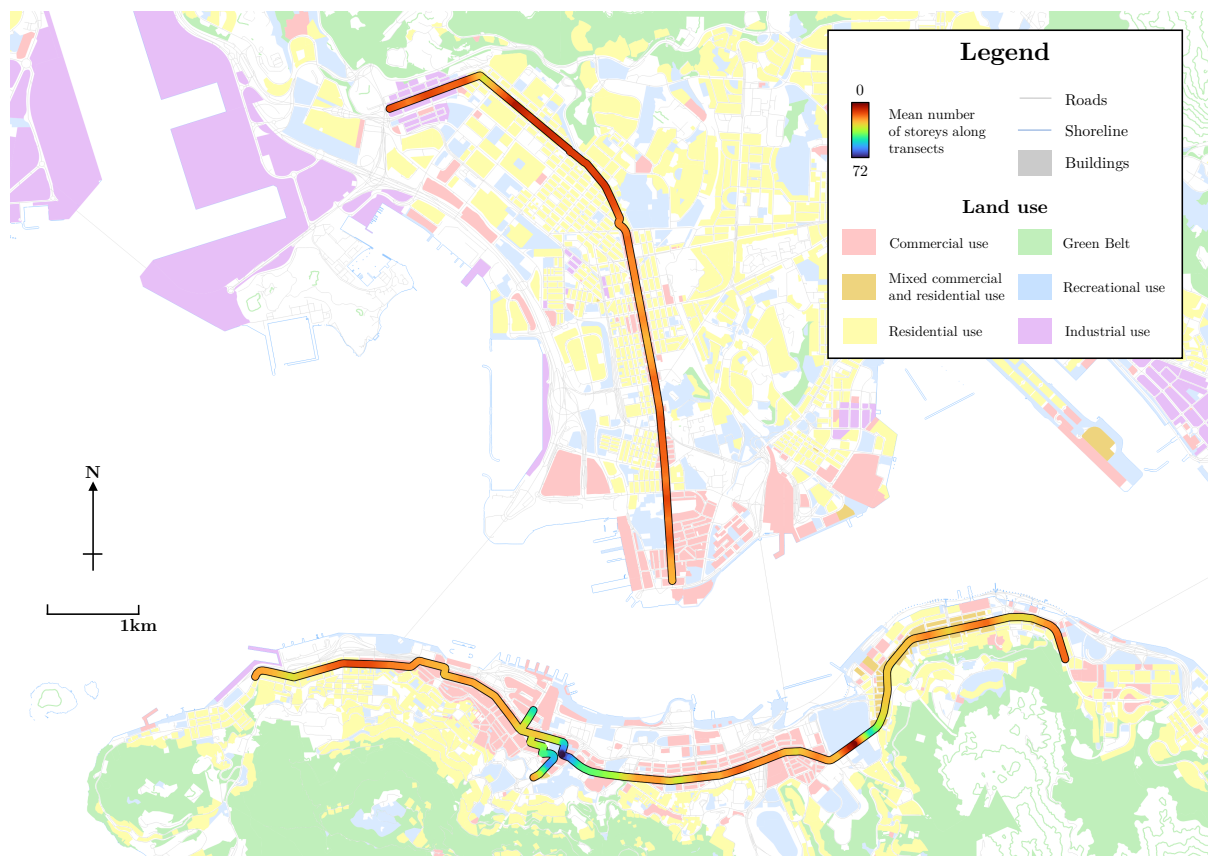


**Figure 35.** A scatter plot of the mean number of storeys, with errors and outliers removed, against the distance from the PLVI, along the west transect.

### 4.5.3 Summary Data Table

	North	East	South	West	Combined
Mean number of storeys (Raw)	15.29	19.88	28.71	18.18	19.43
Standard Deviation of Number of storeys (Raw)	7.73	13.25	23.30	12.23	11.54
Mean number of storeys (No Errors)	16.33	24.96	40.07	21.63	21.13
Standard Deviation of Number of storeys (No Errors)	7.086	10.07	16.58	10.24	10.64
Upper range of number of storeys (No Errors)	15.47	23.55	40.07	20.08	19.66
Lower range of number of storeys (No Errors)	6.111	7.273	16.58	8.168	8.086
Mean number of storeys (No Errors or Outliers)	30.50	45.11	73.23	42.10	27.75
Standard Deviation of number of storeys (No Errors or Outliers)	2.159	4.81	6.91	1.16	11.58
R-value	-0.4566	-0.4254	-0.2571	-0.2890	-0.6262
<i>t</i> -value	2.903	2.531	0.5322	1.129	5.015
Critical <i>t</i> -value	2.037	2.045	2.776	2.145	2.023
<i>t</i> -value > critical <i>t</i> -value / whether to reject H <sub>0</sub>	Yes	Yes	No	No	Yes

**Table 7.** Summary of the mean number of storeys, standard deviation of the number of storeys, and other relevant parameters used in the SRCC, for the north, east, south, west and combined transects.



**Map 12.** Map of the combined transects (Lands Department, Planning Department)

In summary, there is a strong negative correlation between the number of storeys and the distance from PLVI.

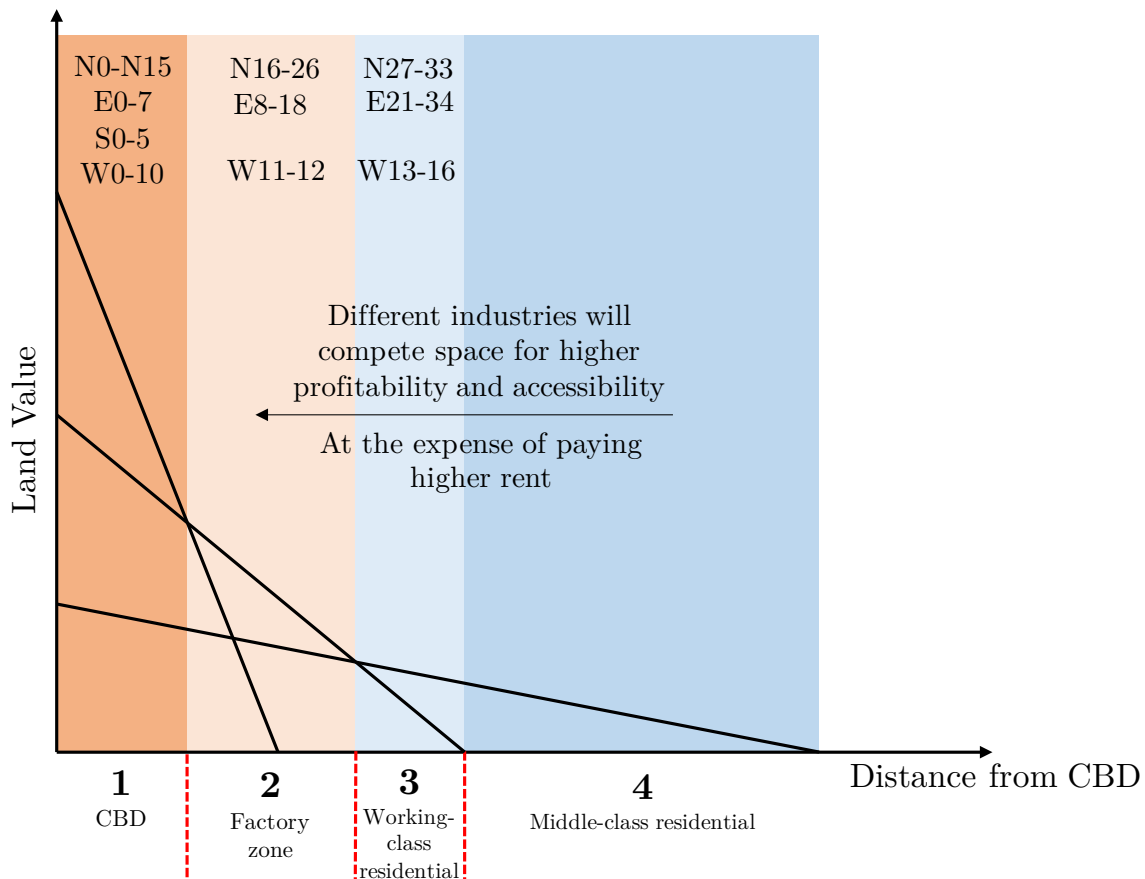


## 5 Conclusion

The research question is “To what extent does Hong Kong fit the pattern of decreasing land values with increasing distance from the Peak Land Value Intersection (PLVI)?”, in which the null hypothesis is “the height of buildings in Hong Kong will not decrease with decreasing with increasing distance from the PLVI”.

In the North and East Transects, the null hypothesis is rejected, and in the South and West Transects, the null hypothesis is accepted. Overall, the null hypothesis is rejected with an R-value of -0.6262, which is significant as the  $t$ -value of 5.015 is larger than the critical  $t$ -value of 2.023.

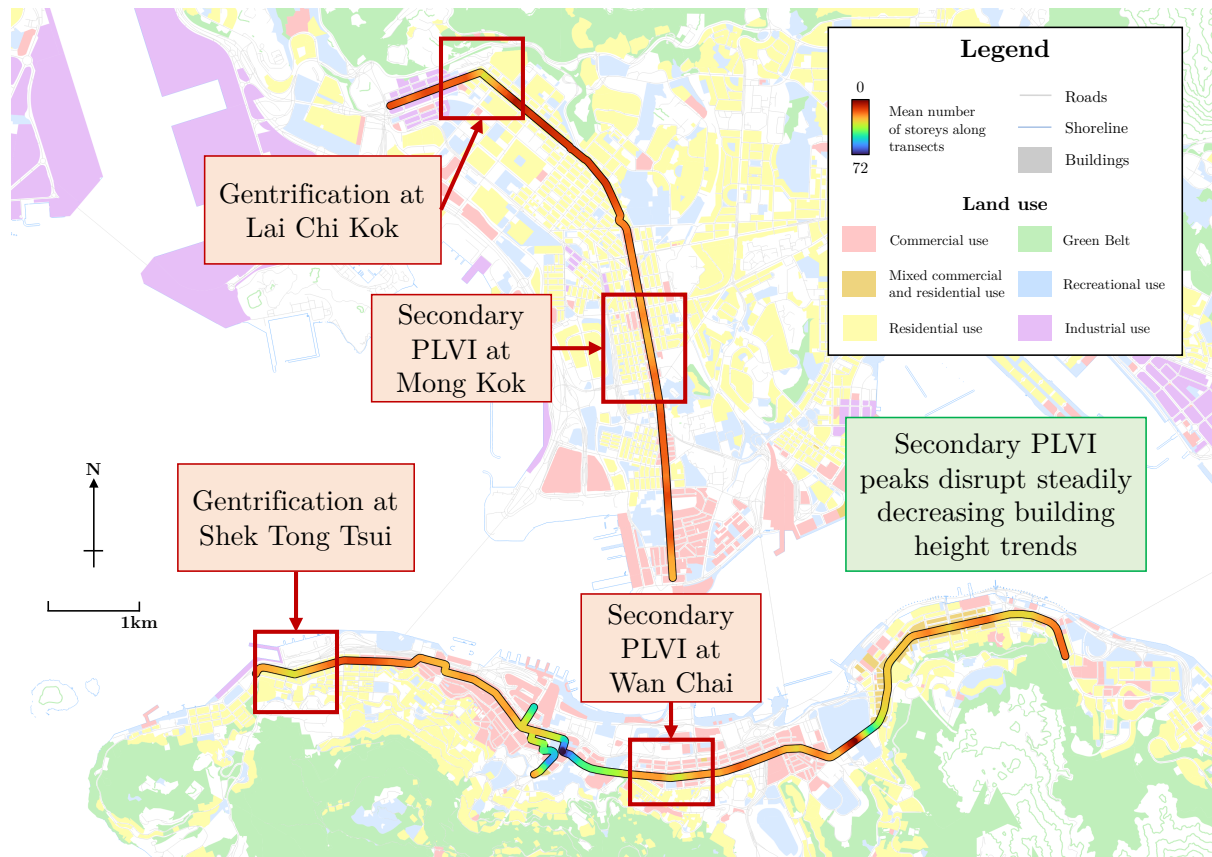
There are several reasons for the decreasing building height as distance increases, the most important being the bid-rent theory:



**Figure 36.** Demonstration of how the bid-rent theory is applicable to all four transects.

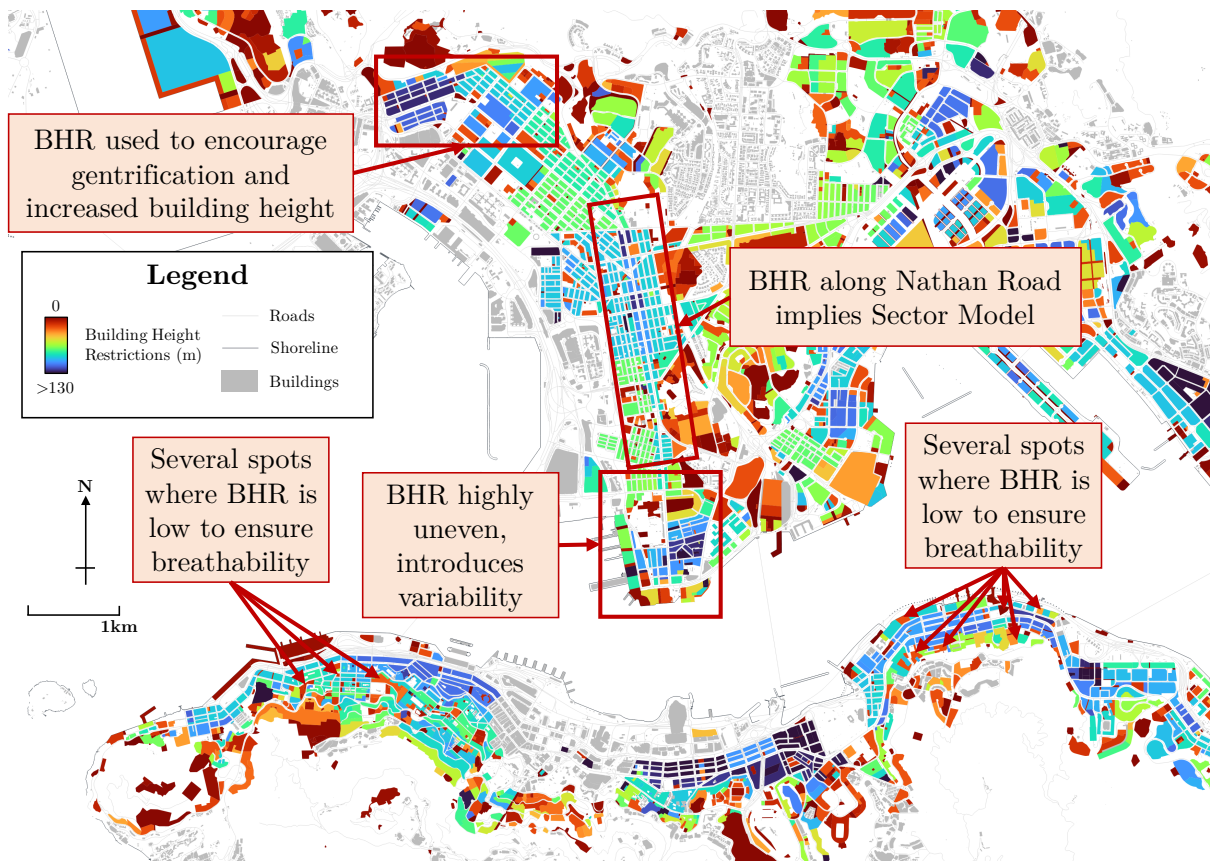
However, there are a multitude of factors cause anomalies, listed below:

## 5.1 Gentrification and Secondary PLVIs



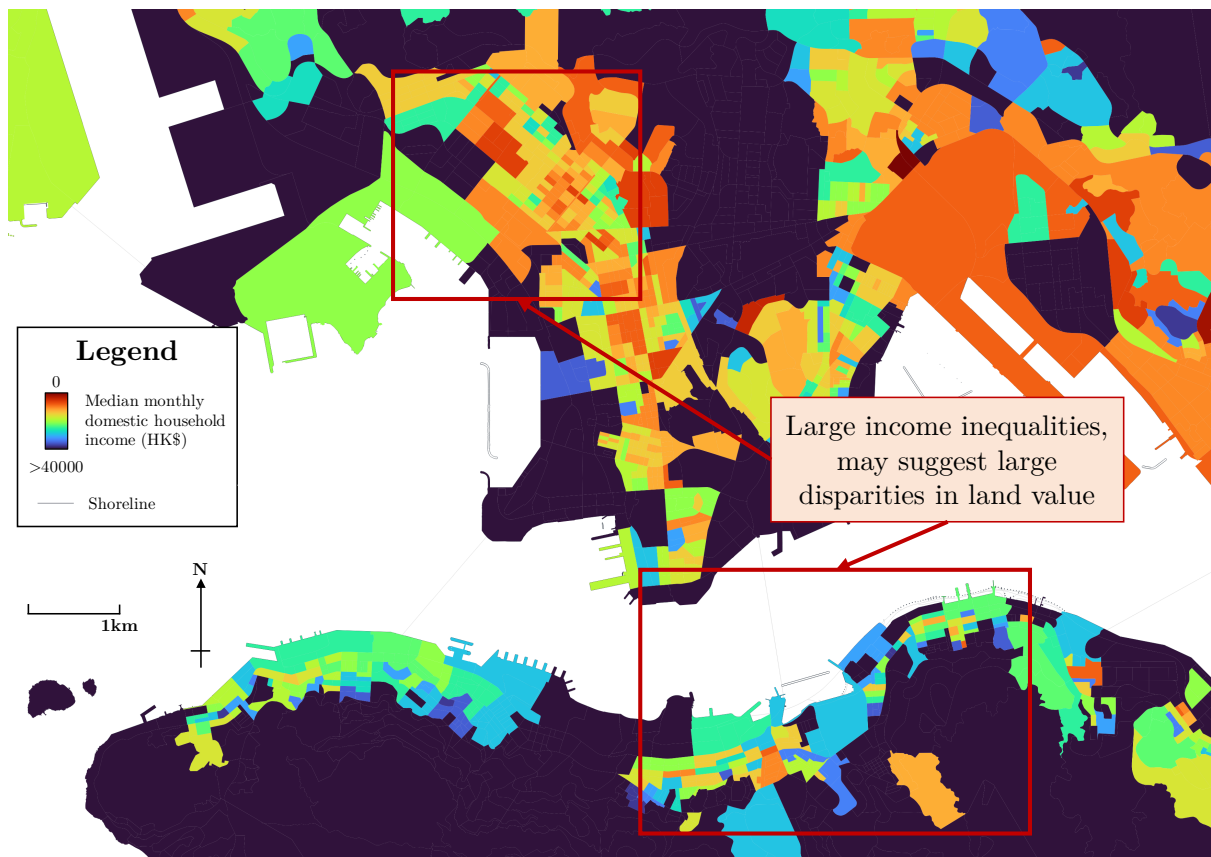
**Figure 37.** Demonstration of how secondary PLVIs can disrupt the decreasing building height trend and result in multi-nucleic development patterns. (Lands Department, Planning Department)

## 5.2 Building Height Restrictions (BHRs)



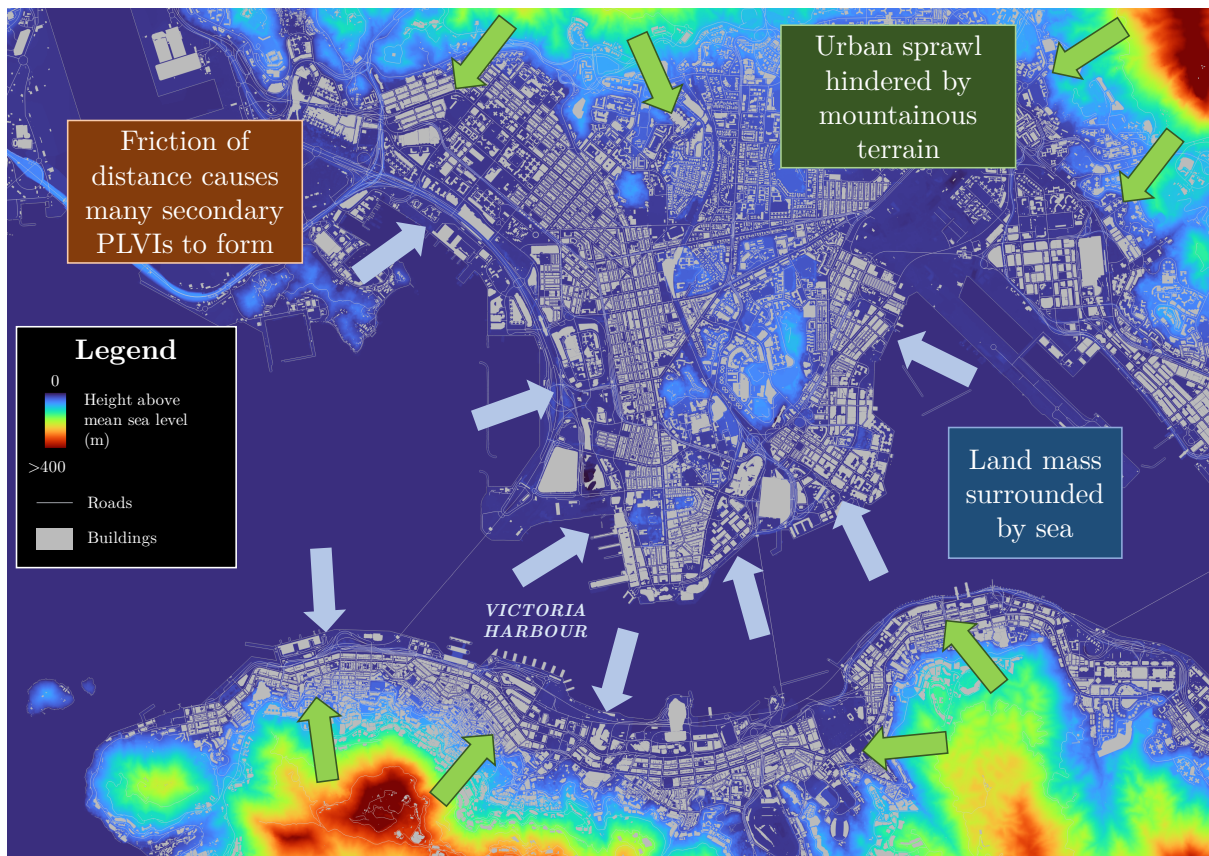
**Figure 38.** Demonstration of how building height restrictions influence the large variability in building height. (Lands Department, Planning Department)

### 5.3 Household income



**Figure 39.** Demonstration of how income inequality implies variability in building height and land value. (Lands Department, Planning Department, Census and Statistics Department)

## 5.4 Terrain



**Figure 40.** Demonstration of how terrain restrictions hinder urban sprawl and how it fosters the development of multi-nuclei secondary PLVIs. (Lands Department, Planning Department)

Combined by the four factors above, it is evident that historically, Hong Kong held many traits of the Burgess model especially during the period of industrialisation, where the concentration of labour is essential. However, after a long developmental history and sectoral shifts, the primary PLVI has started to slowly flatten out and evolve into multiple secondary PLVIs. Combined by recent efforts of gentrification, Hong Kong has become a polycentric city.

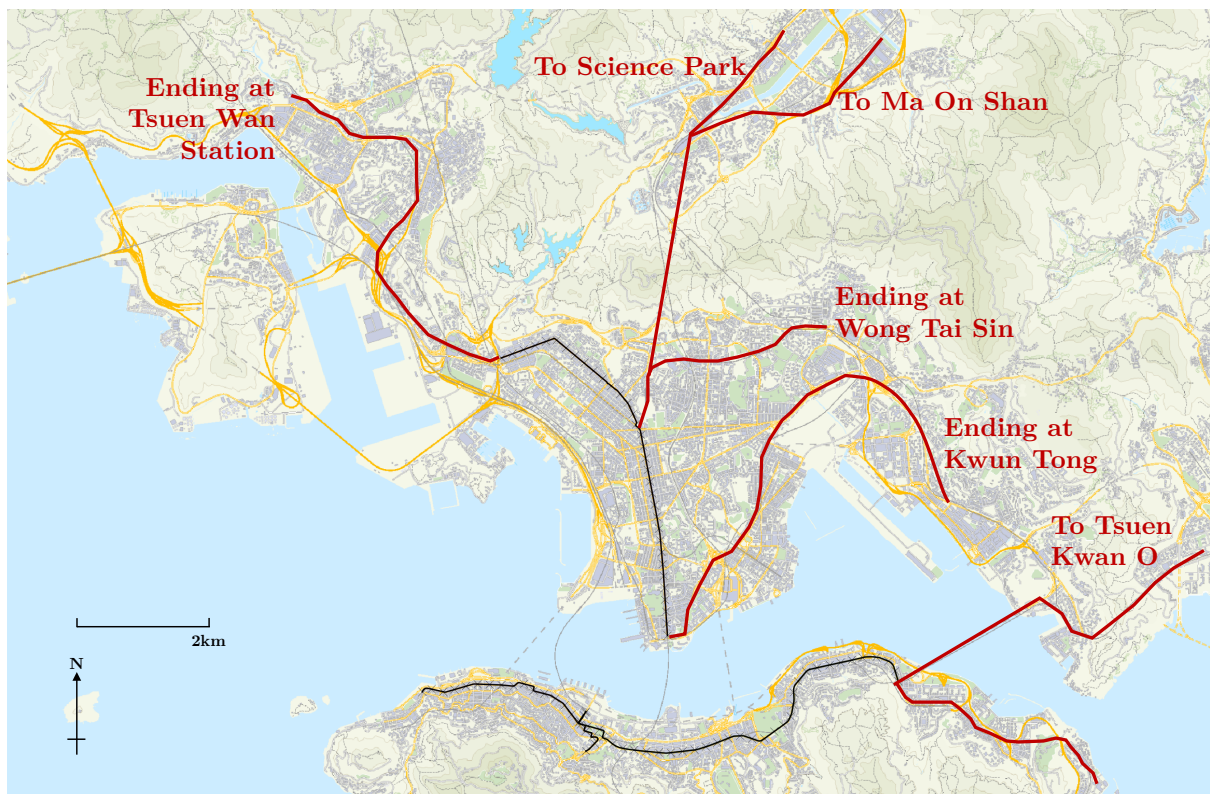
## 6 Evaluation

There are two major limitations to this investigation: inclusiveness, and accuracy.

### 6.1 Inclusiveness

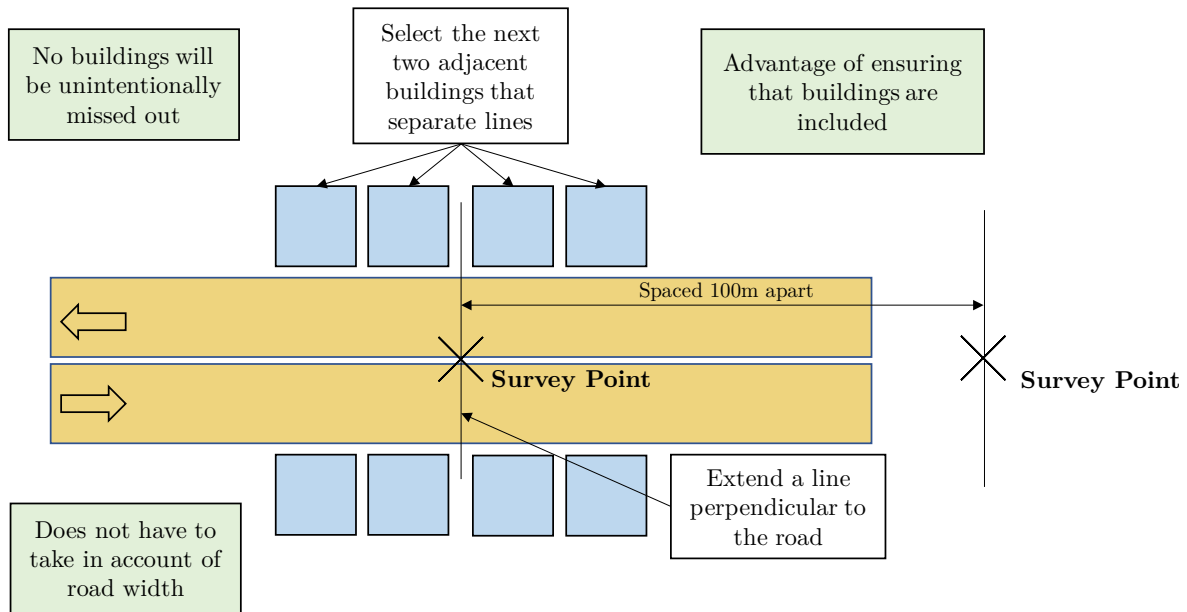
From Figure 36, it can be seen that the current field of study only encompasses the core Kowloon area, which is not representative of the entire Hong Kong because the rural-urban fringe (URF) is ignored. In fact, in the early 1970s, due to rapidly growing population, Hong Kong has constructed “new towns” designed to specifically house the extra population (Hills and Yeh).

The Kowloon area has a very old history, dating back to the 1870s (Lai and Chua). By limiting the scope specifically to Kowloon, the data is only representative of the historical development patterns and does not take in account to the newly constructed “new towns”. Therefore, it is important to expand the transect into specialised areas, for example Kwun Tong (first satellite city that segregates industrial and residential activities) and Sha Tin (mainly residential area with distinct functional zones) to inspect whether the same land value patterns still hold:



**Map 12.** A map showing the expansion and extension of current transects to a variety of different towns enhance data inclusiveness. (Hong Kong Geodata Store)

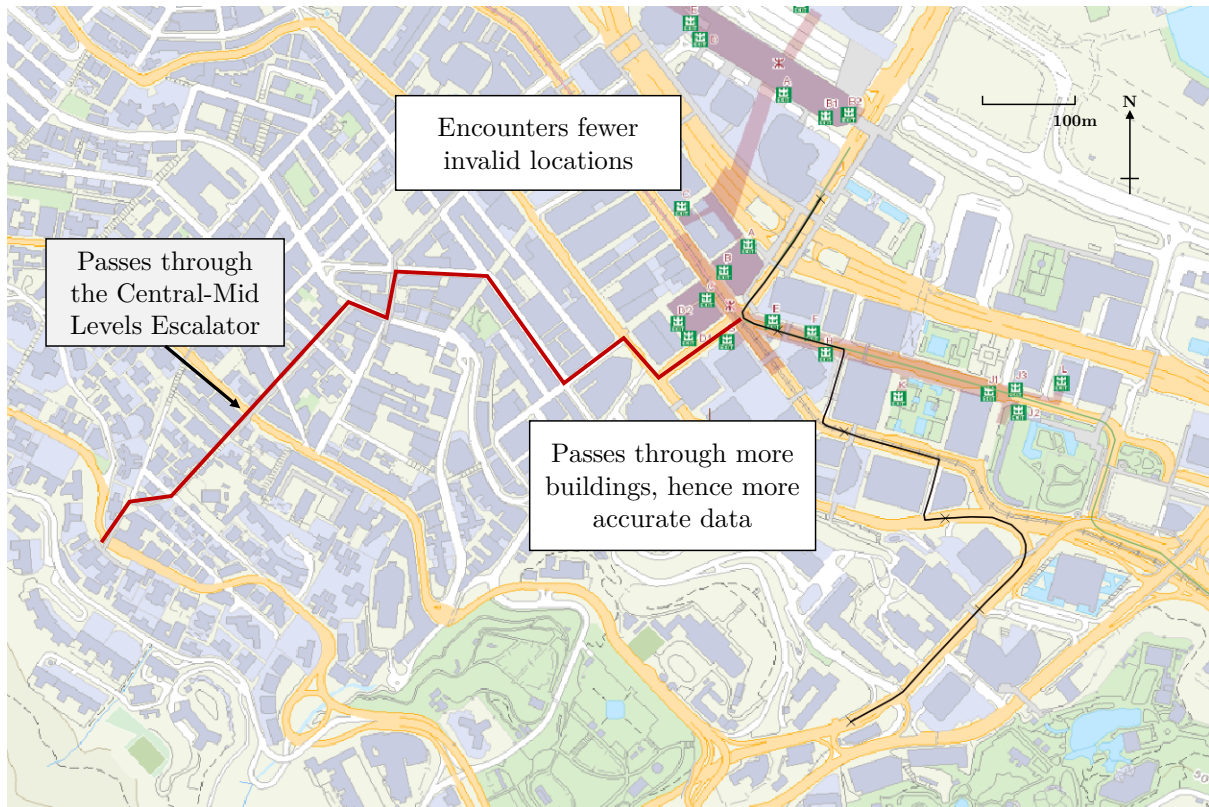
To further improve the data inclusiveness, the current circular buffer with a fixed radius often has issues missing out buildings, for example, S2. Therefore, it has been decided to use adopt the following method with more frequent data:



**Figure 41.** A reliable method of selecting buildings.

## 6.2 Accuracy

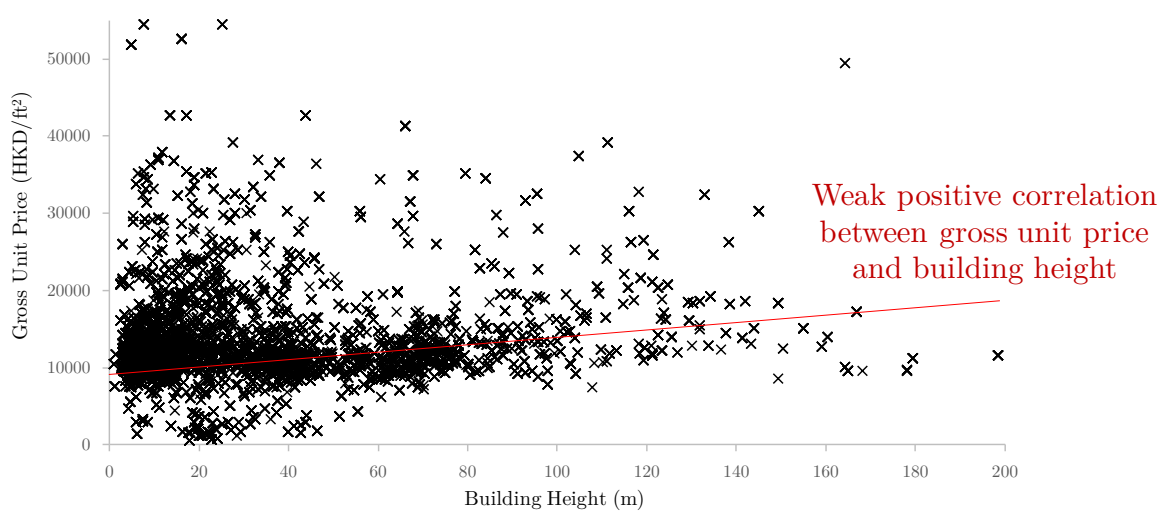
In terms of accuracy, the South Transect in the current investigation is flawed, as it did not have enough valid samples to draw a reliable conclusion. Hence, it has been suggested to use a new transect:



**Map 13.** A map showing the new South Transect (Hong Kong Geodata Store)

Upon further research, it became obvious that building height is not a suitable proxy indicator for land value:

### Plot of Gross Unit Price of Residential Buildings against Building Height



**Figure 42.** A plot of gross unit price of residential buildings against building height. (Centadata)



The reason for this is the floor height for each building is different. For example, a high-density industrial building may have a smaller height to maximise gross floor area, while shopping centres may have a considerable higher height to maximise the sense of comfort (Tam et al.). Furthermore, there are multiple exceptions when building height is not proportional to the land value, for example mansions. It is therefore suggested to obtain the land value directly through government sources.

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## 8 Appendix

### 8.1 Raw Data Tables

Raw data will be presented in the form of tables, the column headers are:

- A. Unique identifier of the data point
- B. Distance to start of transect, in metres
- C. The building identification code used in iB1000 maps<sup>1</sup>
- D. The name of the building
- E. Indication of whether there are no buildings for that data point
- F. Indication of whether the building is invalid, as specified in Section 2.2
- G. Number of storeys

#### 8.1.1 North Transect

A	B	C	D	E	F	G
N0NE	1800	1108244238	26 Nathan Road			28
N0SE	1800	1108244285	Sheraton Hong Kong Hotel & Towers			18
N0SW	1800	1108244290	The Peninsula Hotel Office Tower			30
N0NW	1800	1108244258	The Kowloon Hotel			18
N1NE	2000	1108244148	Holiday Inn Golden Mile Hong Kong			20
N1SE	2000	1108244060	Mirador Mansion			17
N1SW	2000	1108244151	I Square			21
N1NW	2000	1108244082	I Square			31
N2NE	2200	1108243793	Comfort Building			13
N2SE	2200	1108243826	HSBC Building Tsim Sha Tsui			14
N2SW	2200	1108243833	Kowloon Mosque and Islamic Centre		×	2
N2NW	2200	1108243542	Park Lane Shopper's Boulevard		×	2
N3NE	2400	1108243250	Miramar Shopping Centre			18
N3SE	2400	1109609183	The Mira Hong Kong			18
N3SW	2400			×	×	0
N3NW	2400	1108243228	Park Lane Shopper's Boulevard		×	2
N4NE	2600	1108242804	A. Kun Lock Building			11
N4SE	2600	1108242855	Good Results Building			12
N4SW	2600	1108242973	Park Lane Shopper's Boulevard		×	2
N4NW	2600	1108242808	Tsim Sha Tsui Police Station		×	11
N5NE	2800	1108242144	238 Nathan Road			21
N5SE	2800	1108242261	Prudential Centre			22
N5SW	2800	1108242382	Shamrock Hotel			10
N5NW	2800	1108242315	Pearl Oriental Tower			18
N6NE	3000	1108241669	CHI Residences 314			25
N6SE	3000	1108241768	May Ming Building			11
N6SW	3000	1108241727	Hong Kiu Mansion			15
N6NW	3000	1108241688	315 Nathan Road			10
N7NE	3200	1108240652	Eaton Hotel			10

<sup>1</sup> More details of the metadata of iB1000 maps can be found at <https://www.hkmapmeta.gov.hk/mcs/home/web/data/lands/iB1000.html>

N7SE	3200	1108240865	Manulife Provident Funds Place	18
N7SW	3200	1108240829	Nathan Hotel	16
N7NW	3200	1108240658	Hang Shing Building	16
N8NE	3400	1108240186	Chak Fung House	16
N8SE	3400	1108240221	Tang's Mansion	12
N8SW	3400	1108240283	Kowloon Government Offices	× 19
N8NW	3400	1108240246	Tin Hau Temple	× 2
N9NE	3600	1108239661	Bangkok Bank Building	24
N9SE	3600	1108239696	Oxford Commercial Building	24
N9NW	3600	1108239676	Casa Hotel	15
N9SW	3600	1810095790	Casa Deluxe Hotel	14
N10NE	3800	1108238725	Wing Kiu Building	16
N10SE	3800	1108238831	Onward Building	13
N10SW	3800	1108239101	Lai Kee Mansion	13
N10NW	3800	1108238565	Bell House	22
N11NE	4000	1108237754	Wofoo Commercial Building	24
N11SE	4000	1108237821	Kelly Commercial Centre	22
N11SW	4000	1108237866	Full Win Commercial Centre	24
N11NW	4000	1810178822	Ladder Dundas	19
N12NE	4200	1108236167	Good Hope Building	22
N12SE	4200	1108236428	Hollywood Plaza	22
N12SW	4200	1108236423	Sun Hing Building	29
N12NW	4200	1108236334	Fee Tat Commercial Centre	24
N13NE	4400	1108235355	Rex Building	16
N13SE	4400	1108235445	Toa Tak Building	16
N13SW	4400	1108235450	Wu Sang House	26
N13NW	4400	1108246338	HSBC Building Mongkok	17
N14NE	4600	1108233780	T.O.P This is our place	23
N14SE	4600	1108246239	Argyle Centre Phase 1	23
N14SW	4600	1810106386	Le Diamant	20
N14NW	4600	1108233928	Silvercorp Intl Tower	26
N15NE	4800	1108232023	Pioneer Centre	25
N15SE	4800	1108232710	Mascot House	17
N15SW	4800	1108232776	Kingland Apartments	17
N15NW	4800	1109261336	Carprio Mansion	15
N16NE	5000	1108230953	Mong Kok Police Station	× 10
N16SE	5000	1108231548	Edward Mansion	15
N16SW	5000	1108231496	Bijou Apartments	28
N16NW	5000	1108231299	Kwan Ngan House	14
N17NE	5200	1108230402	Prosperity Commercial Building	23
N17SE	5200	1108230452	Tai Sang Bank Building	15
N17SW	5200	1108230503	Amber House	13
N17NW	5200	1108230410	Lee Tat Building	14
N18NE	5400	1108229291	Shing To Building	16
N18SE	5400	1810000587	Emerald Twenty Eight	34
N18SW	5400	1108229363	Hang Shing Building	14
N18NW	5400	1108229242	Tai Po House	12
N19NE	5600	1108228236	Fairview Garden	21
N19SE	5600	1108228278	Yau Luen Apartments	11
N19SW	5600	1108228341	33 Maple Street	6
N19NW	5600	1108228149	Hoi Cheung Building	15

N20NE	5800	1108226640	Pak Far Building			7
N20SE	5800	1108226735	Tung Lo Court Block B			12
N20SW	5800	1108227078	45 Tai Po Road			13
N20NW	5800	1108226958	1A Un Chau Steet			8
N21NE	6000	1108225865	Ka Shun Building			11
N21SE	6000	1108225903	Penta House			12
N21SW	6000	1108226016	Hip Fook Building			11
N21NW	6000	1108225950	Wei Sun Building			12
N22NE	6200			×	×	0
N22SE	6200			×	×	0
N22SW	6200	1108225465	Ying Lun Building			10
N22NW	6200	1108225421	Furama Building			12
N23NE	6400	1108224661	Kin Man Building			11
N23SW	6400	1108224764	Celebrity Commercial Centre			14
N23SW	6400	1108224941	Precious Blood Hospital		×	5
N23NW	6400	1108224749	127 Castle Peak Road			5
N24NE	6600	1108224084	136-138 Castle Peak Road			5
N24SE	6600	1108224091	Wai Lee Commercial Building			13
N24SW	6600	1108224252	Hung Yu Mansion Block B			10
N24NW	6600	1108224142	Prince Theatre			4
N25NE	6800	1108223515	Hing Lung Building			11
N25SE	6800	1108223658	Apollo Building			10
N25SW	6800	1108223789	Spring Wide Mansion			12
N25NW	6800	1108223543	237 Castle Peak Road			10
N26NE	7000	1108223046	278 Castle Peak Road			5
N26SE	7000	1108223049	276 Castle Peak Road			5
N26SW	7000	1108223170	291 Castle Peak Road			6
N26NW	7000	1108223154	293 Castle Peak Road			5
N27NE	7200	1810145002	Heya Star Tower 2			31
N27SE	7200	1108222564	Shun Lee Commercial Building			23
N27SW	7200	1108222663	363 Castle Peak Road			8
N27NW	7200	1108222641	Po Sang Bank Building			11
N28NE	7400	1108222012	Kincheng Commercial Centre			25
N28SE	7400	1108222229	Tone King Building			26
N28SW	7400	1810142493	Heya Delight			33
N28NW	7400	1108222109	Florence Plaza			36
N29NE	7600	1108222026	Por Yen Building			14
N29SE	7600	1108222031	Park Building			22
N29SW	7600	1108222149	Federal Mansion Block A			12
N29NW	7600	1108222206	473 Castle Peak Road			9
N30NE	7800	1108222285	Peninsula Tower			26
N30SE	7800	1108222155	V GA Building			20
N30SW	7800	1108222376	Lai Cheong Factory Building			8
N30NW	7800	1108222452	Hong Kong Spinners Industrial Building Phase VI			10
N31NE	8000	1108222607	Fung Wah Factorial Building			7
N31SE	8000	1108222447	Wing Kut Industrial Building			12
N31SW	8000	1108222674	Kowloon Plaza			17
N31NW	8000	1108222796	Hong Kong Spinners Industrial Building Phase I And II			10
N32NE	8200	1108222836	Ka Ming Court			12
N32SE	8200	1108222878	Trendy Centre			34
N32SW	8200	1108223122	Hong Kong Industrial Centre Block A			12

N32NW	8200	1108223015	Hong Kong Industrial Centre Block B	12
N33NE	8400	1108223041	Hop Hing Industrial Building	13
N33SE	8400	1108223284	International Industrial Building	12
N33SW	8400	1108223054	Charm Centre	16
N33NW	8400	1108223340	Tong Yuen Factory Building	12

### 8.1.2 East Transect

A	B	C	D	E	F	G
E0NE	200	1103124226	One Exchange Square			50
E0SE	200	1103123008	IFC Mall (Hong Kong Station)		×	4
E0SW	200	1103124028	General Post Office		×	3
E0NW	200	1103124531	Jardine House			48
E1NE	400	1103124903	World-wide House			27
E1SE	400		Connaught Rd Flyover	×	×	0
E1SW	400		Connaught Rd Flyover	×	×	0
E1NW	400	1103125246	Chater House			31
E2NE	600			×	×	0
E2SE	600	1103125983	Prince's Building			26
E2SW	600	1103125448	Mandarin Oriental Hotel			25
E2NW	600		Statue Square	×	×	0
E3NE	800		Chater Garden	×	×	0
E3SE	800		Chater Garden	×	×	0
E3SW	800	1810094197	CCB Tower			27
E3NW	800	1103126040	AIA Central			38
E4NE	1000		Open Area	×	×	0
E4SE	1000	1103127344	Bank of China Tower			72
E4SW	1000		Chater Garden	×	×	0
E4NW	1000		Shatin-Central Link Construction Site	×	×	0
E5NE	1200	1103127939	The High Court		×	20
E5SE	1200		Hong Kong Park	×	×	0
E5SW	1200	1103127279	Lippo Centre Tower 2			42
E5NW	1200	1103127459	Lippo Centre Tower 1			46
E6NE	1400	1103128541	One Pacific Place			46
E6SE	1400		Open Area	×	×	0
E6SW	1400	1103127899	United Centre			35
E6NW	1400		Harcourt Garden	×	×	0
E7NE	1600		Flyover	×	×	0
E7SE	1600	1103128710	JW Marriott Hotel			35
E7SW	1600		Flyover	×	×	0
E7NW	1600	1103128050	Arsenal House (West Wing)		×	35
E8NE	1800	1103128761	OZO Wesley			21
E8SE	1800	1103128744	Effectual Building			25
E8SW	1800	1810183790	One Hennessy			22
E8NW	1800	1103128356	Lockhart Exchange Building			19
E9NE	2000	1103128895	Sun Hey Mansion			17
E9SE	2000	1103128896	Shanghai Industrial Investment Building			28
E9SW	2000	1103128580	Sze Bo Building			16
E9NW	2000	1103128583	Hay Wah Building Block A			22
E10NE	2200	1103128909	Southorn Garden			40
E10SE	2200	1103128900	Southorn Centre			32



E10SW	2200	1103128579	China Overseas Building			30
E10NW	2200	1103128578	On Hong Commercial Building			24
E11NE	2400	1103128735	Jade House			16
E11SE	2400	1103128834	Hang Seng Wanchai Building			30
E11SW	2400	1103128465	Tung Wah Mansion			21
E11NW	2400	1103128444	Kwong Tak Mansion			14
E12NE	2600	1103128615	Emperor Group Centre			30
E12SE	2600	1103128646	Caltex House			21
E12SW	2600	1103128311	Easey Commercial Building			22
E12NW	2600	1103128259	Kwong Wah Mansion			17
E13NE	2800	1103128154	Kuo Wah Building			16
E13SE	2800	1103128290	W Square			23
E13SW	2800	1109346356	Yick Wah Building			12
E13NW	2800	1109346361	Luen Wo Building			12
E14NE	3000	1103127632	Yau Kwong Building			16
E14SE	3000	1103127766	Opulent Building			23
E14SW	3000	1103127526	Henning House			19
E14NW	3000	1103127403	BOC Wan Chai Commercial Centre			23
E15NE	3200	1103127238	Thai Kong Building			23
E15SE	3200	1103127322	Cameron Commercial Centre			22
E15SW	3200	1103127103	459-465 Henessey Road			15
E15NW	3200	1103127021	East South Building			15
E16NE	3400	1103127104	The Goldmark			23
E16SE	3400	1810079778	Hysan Place			40
E16SW	3400	1103126886	Macau Yat Yuen Centre			30
E16NW	3400	1103126700	East Point Centre (Old Wing)			18
E17NE	3600	1103127364	60-62 Yee Wo Street			12
E17SE	3600	1103127299	McDonald's Building			21
E17SW	3600	1103127113	V Causeway Bay			19
E17NW	3600	1103127060	Causeway Bay Commercial Building			22
E18NE	3800	1103127265	Causeway Tower			22
E18SE	3800	1103127365	Catic Plaza			27
E18SW	3800		Tai Hang Rd Flyover	×	×	0
E18NW	3800		Tai Hang Rd Flyover	×	×	0
E19NE	4000		Causeway Bay Sports Ground	×	×	0
E19SE	4000	1103126958	Hong Kong Central Library		×	12
E19SW	4000		Victoria Park	×	×	0
E19NW	4000		Victoria Park	×	×	0
E20NE	4200		Open Area	×	×	0
E20SE	4200	1103125871	Queen's College		×	2
E20SW	4200		Victoria Park	×	×	0
E20NW	4200	1103125126	Park Towers Tower I			49
E21NE	4400	1103124444	L'hotel Causeway Bay Harbour View Hong Kong			40
E21SE	4400	1103124762	Kiu Hing Mansion			26
E21SW	4400	1103124878	Park Towers Tower II			30
E21NW	4400	1103124522	Park View Mansion			23
E22NE	4600	1103122595	Belilios Public School		×	6
E22SE	4600	1103123565	King Yu Court			32
E22SW	4600	1103123519	Wilson Court			24
E22NW	4600	1103123250	Sun Ying Mansion			21
E23NE	4800		Comfort Terrace Rest Garden	×	×	

E23SE	4800	1103121981	Comfort Gardens			26
E23SW	4800	1103121975	Kwai Hung Holdings Centre			29
E23NW	4800	1103121811	Kin Ga Building			24
E24NE	5000	1103120818	Fortress Metro Tower Block D			36
E24SE	5000	1103120938	Fortress Metro Tower Block A			36
E24SW	5000	1103120830	Ying Wong House			12
E24NW	5000	1103120777	Chung Nam Mansion			19
E25NE	5200	1103120497	North Point Centre Block A			27
E25SE	5200	1103120557	North Point Centre Block B			27
E25SW	5200	1103120445	Olympia Plaza			25
E25NW	5200	1103120388	Southern Building			20
E26NE	5400	1103120381	Mido Apartments			16
E26SE	5400	1103120396	Hang Ying Building			19
E26SW	5400	1103120276	Coronet Court			15
E26NW	5400	1103120290	Hang Seng North Point Building			23
E27NE	5600	1103120312	Everwin Building			25
E27SE	5600	1103120334	Ming Yuen Centre			28
E27SW	5600	1103120221	Henan Electric Development Building			28
E27NW	5600	1103120100	Kiu Kwan Mansion Block A			28
E28NE	5800	1103120219	Roca Centre Block 2			24
E28SE	5800	1103120249	Maylun Apartments			17
E28SW	5800	1103120091	On Ning Building			17
E28NW	5800	1103120068	Chu Kee Building			20
E29NE	6000	1103120125	Island Place Tower			23
E29SE	6000	1103120148	HKU School of Professional and Continuing Education		×	23
E29SW	6000	1103119944	North Point Industrial Building			22
E29NW	6000	1103119910	Marble Road Telephone Exchange			4
E30NE	6200	1103119981	Healthy Gardens Block C			27
E30SE	6200	1103120003	Healthy Gardens Block B			27
E30SW	6200		King's Road Playground		×	0
E30NW	6200		Flyover		×	0
E31NE	6400	1103120007	Hong Shing Court			27
E31SE	6400	1103119962	Hong Cheung Court			27
E31SW	6400	1103119879	625 King's Road			25
E31NW	6400	1103119892	633 King's Road			35
E32NE	6600	1103120191	Man Cheung House			6
E32SE	6600	1103120117	AIA Hong Kong Tower			19
E32SW	6600	1103119955	Prosperity Millennia Plaza			27
E32NW	6600	1103120026	Harbour Plaza, North Point			27
E33NE	6800	1810186401	Golden Horse Mansion			27
E33SE	6800	1103120430	Mansion Building			13
E33SW	6800	1103120407	Lai Wah Mansion			13
E33NW	6800	1103120475	Ritz Garden Apartments			11
E34NE	7000	1103121003	Quarry Bay Station		×	3
E34SE	7000	1103120983	North Point Government Primary School		×	9
E34SW	7000	1103120812	Wai Fong Court			23
E34NW	7000	1103120796	Tor Po Mansion			9

### 8.1.3 South Transect

A	B	C	D	E	F	G
S0NE	200	1103124226	One Exchange Square			50
S0SE	200	1103123008	IFC Mall (Hong Kong Station)		×	4
S0SW	200	1103124028	General Post Office		×	3
S0NW	200	1103124531	Jardine House			48
S1NE	400	1103125853	Gloucester Tower			44
S1SE	400	1103124903	World-wide House			27
S1SW	400	1103125246	Chater House			31
S1NW	400	1103125889	Alexandra House			35
S2NE	600	1103126642	Standard Chartered Bank Building			32
S2SE	600	1103126580	The Galleria			33
S2SW	600			×		0
S2NW	600	1103125983	Prince's Building			26
S3NE	800	1103127201	Cheung Kong Center			70
S3SE	800	1103127307	Former French Mission Building		×	3
S3SW	800	1103126706	HSBC Main Building			46
S3NW	800	1103126848	Bank of China Building			15
S4NE	1000	1103127404	Cheung Kong Park		×	0
S4SE	1000	1103127201	Cheung Kong Center		×	70
S4SW	1000	1103127344	Bank of China Tower			70
S4NW	1000	1103127911	Champion Tower			47
S5NE	1200	1103128212	Consulate General of the United States of America		×	5
S5SE	1200			×	×	5
S5SW	1200	1103128636	St. John's Building			22
S5NW	1200	1103128772	The Helena May		×	3

### 8.1.4 West Transect

A	B	C	D	E	F	G
W0NE	200	1103124028	General Post Office		×	3
W0SE	200	1103124531	Jardine House			48
W0SW	200	1103123897	Two Exchange Square			50
W0NW	200	1103123008	IFC Mall (Hong Kong Station)		×	4
W1NE	400			×		0
W1SE	400	1103125246	Chater House			30
W1SW	400			×		0
W1NW	400	1103124903	World-wide House			30
W2NE	600	1103124097	The Chinese Bank Building			29
W2SE	600	1103124289	Hip Shing Hong Centre			22
W2SW	600	1103124542	Tung Ming Building			15
W2NW	600	1103124370	Prosperous Building			17
W3NE	800	1103123339	Dah Sing Life Building			22
W3SE	800	1103123422	Hang Seng Bank Headquarters			27
W3SW	800	1103123440	Central 88			26
W3NW	800	1103123315	Hung Tak Building			16
W4NE	1000	1103122247	Nan Fung Tower			29

W4SE	1000			×	0
W4SW	1000	1103122673	Cheung's Building		14
W4NW	1000	1103122090	Li Po Chun Chambers		28
W5NE	1200	1103121854	Blissful Building		15
W5SE	1200	1810151856	Continental Place		21
W5SW	1200	1103122129	Tung Hip Commercial Building		26
W5NW	1200	1103121716	Tung Ning Building		20
W6NE	1400	1103121420	Kai Tak Commercial Building		21
W6SE	1400	1103121840	FWD Financial Centre		29
W6SW	1400	1103121802	West Exchange Tower	×	28
W6NW	1400	1103121354	Western Market	×	4
W7NE	1600			×	0
W7SE	1600	1103121141	Seaview Commercial Building		23
W7SW	1600	1103121112	Connaught Harbourfront House		22
W7NW	1600			×	0
W8NE	1800	1103120950	No.9 Des Voeux Road West		25
W8SE	1800	1103121358	Kingdom Power Commercial Building		15
W8SW	1800	1103121330	Western Centre		21
W8NW	1800	1103121080	Sing Kui Commercial Building		16
W9NE	2000	1103121016	Chiu Chow Association Building		10
W9SE	2000	1103121249	Yu Chu Lam Building		9
W9SW	2000	1810156458	AVA128		29
W9NW	2000	1103121008	Lucky Commercial Centre		24
W10NE	2200	1103120999	Tak Tung House		15
W10SE	2200	1103121193	Luen Tak Building		14
W10SW	2200	1103121183	Wai Tak Building		14
W10NW	2200	1103120982	Wing Fat Mansion		8
W11NE	2400	1103120926	Tak May House		5
W11SE	2400	1103121148	Tung Che Commercial Centre		24
W11SW	2400	1103121139	Ching Tak Building		16
W11NW	2400	1103120932	Wah Lap House		5
W12NE	2600	1103121082	Tin Hing Building		6
W12SE	2600	1103121419	Siu Cheung Building		6
W12SW	2600	1103121425	Liang Ga Building		22
W12NW	2600	1810159283	Bohemian House		31
W13NE	2800	1103121272	Kwan Yick Building Phase II Block B		24
W13SE	2800	1103121646	Chung Ah Building		15
W13SW	2800	1103121710	Lucky Building		9
W13NW	2800	1810143106	Upton		46
W14NE	3000	1103121694	Lun Fung Court		35
W14SE	3000	1103121987			13
W14SW	3000	1103121900	Pacific Plaza		29
W14NW	3000	1103121540	Hong Kong Plaza		42
W15NE	3200			×	0
W15SE	3200	1103121696	Mei Sun Lau Block A		24
W15SW	3200	1103121624	Hong Kong Industrial Building		22
W15NW	3200			×	0
W16NE	3400	1103121801	Wo Fat Building		20

W16SE	3400	1103121970	Sum Way Mansion			23
W16SW	3400				×	0
W16NW	3400				×	0

### 8.1.5 Combined Transect

A	B	C	D	E	F	G
E0NE	200	1103124226	One Exchange Square			50
E0SE	200	1103123008	IFC Mall (Hong Kong Station)		×	4
E0SW	200	1103124028	General Post Office		×	3
E0NW	200	1103124531	Jardine House			48
S0NE	200	1103124226	One Exchange Square			50
S0SE	200	1103123008	IFC Mall (Hong Kong Station)		×	4
S0SW	200	1103124028	General Post Office		×	3
S0NW	200	1103124531	Jardine House			48
W0NE	200	1103124028	General Post Office		×	3
W0SE	200	1103124531	Jardine House			48
W0SW	200	1103123897	Two Exchange Square			50
W0NW	200	1103123008	IFC Mall (Hong Kong Station)		×	4
E1NE	400	1103124903	World-wide House			27
E1SE	400		Connaught Rd Flyover	×	×	0
E1SW	400		Connaught Rd Flyover	×	×	0
E1NW	400	1103125246	Chater House			31
S1NE	400	1103125853	Gloucester Tower			44
S1SE	400	1103124903	World-wide House			27
S1SW	400	1103125246	Chater House			31
S1NW	400	1103125889	Alexandra House			35
W1NE	400			×		0
W1SE	400	1103125246	Chater House			30
W1SW	400			×		0
W1NW	400	1103124903	World-wide House			30
E2NE	600			×	×	0
E2SE	600	1103125983	Prince's Building			26
E2SW	600	1103125448	Mandarin Oriental Hotel			25
E2NW	600		Statue Square	×	×	0
S2NE	600	1103126642	Standard Chartered Bank Building			32
S2SE	600	1103126580	The Galleria			33
S2SW	600			×		0
S2NW	600	1103125983	Prince's Building			26
W2NE	600	1103124097	The Chinese Bank Building			29
W2SE	600	1103124289	Hip Shing Hong Centre			22
W2SW	600	1103124542	Tung Ming Building			15
W2NW	600	1103124370	Prosperous Building			17
E3NE	800		Chater Garden	×	×	0
E3SE	800		Chater Garden	×	×	0
E3SW	800	1810094197	CCB Tower			27
E3NW	800	1103126040	AIA Central			38
S3NE	800	1103127201	Cheung Kong Center			70

S3SE	800	1103127307	Former French Mission Building		×		3
S3SW	800	1103126706	HSBC Main Building				46
S3NW	800	1103126848	Bank of China Building				15
W3NE	800	1103123339	Dah Sing Life Building				22
W3SE	800	1103123422	Hang Seng Bank Headquarters				27
W3SW	800	1103123440	Central 88				26
W3NW	800	1103123315	Hung Tak Building				16
E4NE	1000		Open Area		×	×	0
E4SE	1000	1103127344	Bank of China Tower				72
E4SW	1000		Chater Garden		×	×	0
E4NW	1000		Shatin-Central Link Construction Site		×	×	0
S4NE	1000	1103127404	Cheung Kong Park			×	0
S4SE	1000	1103127201	Cheung Kong Center			×	70
S4SW	1000	1103127344	Bank of China Tower				70
S4NW	1000	1103127911	Champion Tower				47
W4NE	1000	1103122247	Nan Fung Tower				29
W4SE	1000				×		0
W4SW	1000	1103122673	Cheung's Building				14
W4NW	1000	1103122090	Li Po Chun Chambers				28
E5NE	1200	1103127939	The High Court			×	20
E5SE	1200		Hong Kong Park		×	×	0
E5SW	1200	1103127279	Lippo Centre Tower 2				42
E5NW	1200	1103127459	Lippo Centre Tower 1				46
S5NE	1200	1103128212	Consulate General of the United States of America			×	5
S5SE	1200				×	×	5
S5SW	1200	1103128636	St. John's Building				22
S5NW	1200	1103128772	The Helena May			×	3
W5NE	1200	1103121854	Blissful Building				15
W5SE	1200	1810151856	Continental Place				21
W5SW	1200	1103122129	Tung Hip Commercial Building				26
W5NW	1200	1103121716	Tung Ning Building				20
E6NE	1400	1103128541	One Pacific Place				46
E6SE	1400		Open Area		×	×	0
E6SW	1400	1103127899	United Centre				35
E6NW	1400		Harcourt Garden		×	×	0
W6NE	1400	1103121420	Kai Tak Commercial Building				21
W6SE	1400	1103121840	FWD Financial Centre				29
W6SW	1400	1103121802	West Exchange Tower			×	28
W6NW	1400	1103121354	Western Market			×	4
E7NE	1600		Flyover		×	×	0
E7SE	1600	1103128710	JW Marriott Hotel				35
E7SW	1600		Flyover		×	×	0
E7NW	1600	1103128050	Arsenal House (West Wing)			×	35
W7NE	1600				×		0
W7SE	1600	1103121141	Seaview Commercial Building				23
W7SW	1600	1103121112	Connaught Harbourfront House				22
W7NW	1600				×		0
N0NE	1800	1108244238	26 Nathan Road				28
N0SE	1800	1108244285	Sheraton Hong Kong Hotel & Towers				18

N0SW	1800		The Peninsula Hotel Office Tower			30	
N0NW	1800	1108244258	The Kowloon Hotel			18	
E8NE	1800	1103128761	OZO Wesley			21	
E8SE	1800	1103128744	Effectual Building			25	
E8SW	1800	1810183790	One Hennessy			22	
E8NW	1800	1103128356	Lockhart Exchange Building			19	
W8NE	1800	1103120950	No.9 Des Voeux Road West			25	
W8SE	1800	1103121358	Kingdom Power Commercial Building			15	
W8SW	1800	1103121330	Western Centre			21	
W8NW	1800	1103121080	Sing Kui Commercial Building			16	
N1NE	2000	1108244148	Holiday Inn Golden Mile Hong Kong			20	
N1SE	2000	1108244060	Mirador Mansion			17	
N1SW	2000	1108244151	I Square			21	
N1NW	2000	1108244082	I Square			31	
E9NE	2000	1103128895	Sun Hey Mansion			17	
E9SE	2000	1103128896	Shanghai Industrial Investment Building			28	
E9SW	2000	1103128580	Sze Bo Building			16	
E9NW	2000	1103128583	Hay Wah Building Block A			22	
W9NE	2000	1103121016	Chiu Chow Association Building			10	
W9SE	2000	1103121249	Yu Chu Lam Building			9	
W9SW	2000	1810156458	AVA128			29	
W9NW	2000	1103121008	Lucky Commercial Centre			24	
N2NE	2200	1108243793	Comfort Building			13	
N2SE	2200	1108243826	HSBC Building Tsim Sha Tsui			14	
N2SW	2200	1108243833	Kowloon Mosque and Islamic Centre		×	2	
N2NW	2200	1108243542	Park Lane Shopper's Boulevard		×	2	
E10NE	2200	1103128909	Southern Garden			40	
E10SE	2200	1103128900	Southern Centre			32	
E10SW	2200	1103128579	China Overseas Building			30	
E10NW	2200	1103128578	On Hong Commercial Building			24	
W10NE	2200	1103120999	Tak Tung House			15	
W10SE	2200	1103121193	Luen Tak Building			14	
W10SW	2200	1103121183	Wai Tak Building			14	
W10NW	2200	1103120982	Wing Fat Mansion			8	
N3NE	2400	1108243250	Miramar Shopping Centre			18	
N3SE	2400	1109609183	The Mira Hong Kong			18	
N3SW	2400				×	×	0
N3NW	2400	1108243228	Park Lane Shopper's Boulevard			×	2
E11NE	2400	1103128735	Jade House			16	
E11SE	2400	1103128834	Hang Seng Wanchai Building			30	
E11SW	2400	1103128465	Tung Wah Mansion			21	
E11NW	2400	1103128444	Kwong Tak Mansion			14	
W11NE	2400	1103120926	Tak May House			5	
W11SE	2400	1103121148	Tung Che Commercial Centre			24	
W11SW	2400	1103121139	Ching Tak Building			16	
W11NW	2400	1103120932	Wah Lap House			5	
N4NE	2600	1108242804	A. Kun Lock Building			11	
N4SE	2600	1108242855	Good Results Building			12	
N4SW	2600	1108242973	Park Lane Shopper's Boulevard			×	2
N4NW	2600	1108242808	Tsim Sha Tsui Police Station			×	11
E12NE	2600	1103128615	Emperor Group Centre			30	

E12SE	2600	1103128646	Caltex House	21	
E12SW	2600	1103128311	Easey Commercial Building	22	
E12NW	2600	1103128259	Kwong Wah Mansion	17	
W12NE	2600	1103121082	Tin Hing Building	6	
W12SE	2600	1103121419	Siu Cheung Building	6	
W12SW	2600	1103121425	Liang Ga Building	22	
W12NW	2600	1810159283	Bohemian House	31	
N5NE	2800	1108242144	238 Nathan Road	21	
N5SE	2800	1108242261	Prudential Centre	22	
N5SW	2800	1108242382	Shamrock Hotel	10	
N5NW	2800	1108242315	Pearl Oriental Tower	18	
E13NE	2800	1103128154	Kuo Wah Building	16	
E13SE	2800	1103128290	W Square	23	
E13SW	2800	1109346356	Yick Wah Building	12	
E13NW	2800	1109346361	Luen Wo Building	12	
W13NE	2800	1103121272	Kwan Yick Building Phase II Block B	24	
W13SE	2800	1103121646	Chung Ah Building	15	
W13SW	2800	1103121710	Lucky Building	9	
W13NW	2800	1810143106	Upton	46	
N6NE	3000	1108241669	CHI Residences 314	25	
N6SE	3000	1108241768	May Ming Building	11	
N6SW	3000	1108241727	Hong Kiu Mansion	15	
N6NW	3000	1108241688	315 Nathan Road	10	
E14NE	3000	1103127632	Yau Kwong Building	16	
E14SE	3000	1103127766	Opulent Building	23	
E14SW	3000	1103127526	Henning House	19	
E14NW	3000	1103127403	BOC Wan Chai Commercial Centre	23	
W14NE	3000	1103121694	Lun Fung Court	35	
W14SE	3000	1103121987		13	
W14SW	3000	1103121900	Pacific Plaza	29	
W14NW	3000	1103121540	Hong Kong Plaza	42	
N7NE	3200	1108240652	Eaton Hotel	10	
N7SE	3200	1108240865	Manulife Provident Funds Place	18	
N7SW	3200	1108240829	Nathan Hotel	16	
N7NW	3200	1108240658	Hang Shing Building	16	
E15NE	3200	1103127238	Thai Kong Building	23	
E15SE	3200	1103127322	Cameron Commercial Centre	22	
E15SW	3200	1103127103	459-465 Henessey Road	15	
E15NW	3200	1103127021	East South Building	15	
W15NE	3200			×	0
W15SE	3200	1103121696	Mei Sun Lau Block A	24	
W15SW	3200	1103121624	Hong Kong Industrial Building	22	
W15NW	3200			×	0
N8NE	3400	1108240186	Chak Fung House	16	
N8SE	3400	1108240221	Tang's Mansion	12	
N8SW	3400	1108240283	Kowloon Government Offices	×	19
N8NW	3400	1108240246	Tin Hau Temple	×	2
E16NE	3400	1103127104	The Goldmark	23	
E16SE	3400	1810079778	Hysan Place	40	
E16SW	3400	1103126886	Macau Yat Yuen Centre	30	
E16NW	3400	1103126700	East Point Centre (Old Wing)	18	



W16NE	3400	1103121801	Wo Fat Building				20	
W16SE	3400	1103121970	Sum Way Mansion				23	
W16SW	3400					×	0	
W16NW	3400					×	0	
N9NE	3600	1108239661	Bangkok Bank Building				24	
N9SE	3600	1108239696	Oxford Commercial Building				24	
N9NW	3600	1108239676	Casa Hotel				15	
N9SW	3600	1810095790	Casa Deluxe Hotel				14	
E17NE	3600	1103127364	60-62 Yee Wo Street				12	
E17SE	3600	1103127299	McDonald's Building				21	
E17SW	3600	1103127113	V Causeway Bay				19	
E17NW	3600	1103127060	Causeway Bay Commercial Building				22	
N10NE	3800	1108238725	Wing Kiu Building				16	
N10SE	3800	1108238831	Onward Building				13	
N10SW	3800	1108239101	Lai Kee Mansion				13	
N10NW	3800	1108238565	Bell House				22	
E18NE	3800	1103127265	Causeway Tower				22	
E18SE	3800	1103127365	Catic Plaza				27	
E18SW	3800		Tai Hang Rd Flyover			×	×	0
E18NW	3800		Tai Hang Rd Flyover			×	×	0
N11NE	4000	1108237754	Wofoo Commercial Building				24	
N11SE	4000	1108237821	Kelly Commercial Centre				22	
N11SW	4000	1108237866	Full Win Commercial Centre				24	
N11NW	4000	1810178822	Ladder Dundas				19	
E19NE	4000		Causeway Bay Sports Ground			×	×	0
E19SE	4000	1103126958	Hong Kong Central Library				×	12
E19SW	4000		Victoria Park			×	×	0
E19NW	4000		Victoria Park			×	×	0
N12NE	4200	1108236167	Good Hope Building				22	
N12SE	4200	1108236428	Hollywood Plaza				22	
N12SW	4200	1108236423	Sun Hing Building				29	
N12NW	4200	1108236334	Fee Tat Commercial Centre				24	
E20NE	4200		Open Area			×	×	0
E20SE	4200	1103125871	Queen's College				×	2
E20SW	4200		Victoria Park			×	×	0
E20NW	4200	1103125126	Park Towers Tower I					49
N13NE	4400	1108235355	Rex Building				16	
N13SE	4400	1108235445	Toa Tak Building				16	
N13SW	4400	1108235450	Wu Sang House				26	
N13NW	4400	1108246338	HSBC Building Mongkok				17	
E21NE	4400	1103124444	L'hotel Causeway Bay Harbour View Hong Kong				40	
E21SE	4400	1103124762	Kiu Hing Mansion				26	
E21SW	4400	1103124878	Park Towers Tower II				30	
E21NW	4400	1103124522	Park View Mansion				23	
N14NE	4600	1108233780	T.O.P This is our place				23	
N14SE	4600	1108246239	Argyle Centre Phase 1				23	
N14SW	4600	1810106386	Le Diamant				20	
N14NW	4600	1108233928	Silvercorp Intl Tower				26	
E22NE	4600	1103122595	Belilios Public School				×	6
E22SE	4600	1103123565	King Yu Court					32
E22SW	4600	1103123519	Wilson Court					24

E22NW	4600	1103123250	Sun Ying Mansion			21
N15NE	4800	1108232023	Pioneer Centre			25
N15SE	4800	1108232710	Mascot House			17
N15SW	4800	1108232776	Kingland Apartments			17
N15NW	4800	1109261336	Carprio Mansion			15
E23NE	4800		Comfort Terrace Rest Garden	×	×	
E23SE	4800	1103121981	Comfort Gardens			26
E23SW	4800	1103121975	Kwai Hung Holdings Centre			29
E23NW	4800	1103121811	Kin Ga Building			24
N16NE	5000	1108230953	Mong Kok Police Station		×	10
N16SE	5000	1108231548	Edward Mansion			15
N16SW	5000	1108231496	Bijou Apartments			28
N16NW	5000	1108231299	Kwan Ngan House			14
E24NE	5000	1103120818	Fortress Metro Tower Block D			36
E24SE	5000	1103120938	Fortress Metro Tower Block A			36
E24SW	5000	1103120830	Ying Wong House			12
E24NW	5000	1103120777	Chung Nam Mansion			19
N17NE	5200	1108230402	Prosperity Commercial Building			23
N17SE	5200	1108230452	Tai Sang Bank Building			15
N17SW	5200	1108230503	Amber House			13
N17NW	5200	1108230410	Lee Tat Building			14
E25NE	5200	1103120497	North Point Centre Block A			27
E25SE	5200	1103120557	North Point Centre Block B			27
E25SW	5200	1103120445	Olympia Plaza			25
E25NW	5200	1103120388	Southern Building			20
N18NE	5400	1108229291	Shing To Building			16
N18SE	5400	1810000587	Emerald Twenty Eight			34
N18SW	5400	1108229363	Hang Shing Building			14
N18NW	5400	1108229242	Tai Po House			12
E26NE	5400	1103120381	Mido Apartments			16
E26SE	5400	1103120396	Hang Ying Building			19
E26SW	5400	1103120276	Coronet Court			15
E26NW	5400	1103120290	Hang Seng North Point Building			23
N19NE	5600	1108228236	Fairview Garden			21
N19SE	5600	1108228278	Yau Luen Apartments			11
N19SW	5600	1108228341	33 Maple Street			6
N19NW	5600	1108228149	Hoi Cheung Building			15
E27NE	5600	1103120312	Everwin Building			25
E27SE	5600	1103120334	Ming Yuen Centre			28
E27SW	5600	1103120221	Henan Electric Development Building			28
E27NW	5600	1103120100	Kiu Kwan Mansion Block A			28
N20NE	5800	1108226640	Pak Far Building			7
N20SE	5800	1108226735	Tung Lo Court Block B			12
N20SW	5800	1108227078	45 Tai Po Road			13
N20NW	5800	1108226958	1A Un Chau Steet			8
E28NE	5800	1103120219	Roca Centre Block 2			24
E28SE	5800	1103120249	Maylun Apartments			17
E28SW	5800	1103120091	On Ning Building			17
E28NW	5800	1103120068	Chu Kee Building			20
N21NE	6000	1108225865	Ka Shun Building			11
N21SE	6000	1108225903	Penta House			12

N21SW	6000	1108226016	Hip Fook Building			11
N21NW	6000	1108225950	Wei Sun Building			12
E29NE	6000	1103120125	Island Place Tower			23
E29SE	6000	1103120148	HKU School of Professional and Continuing Education	×		23
E29SW	6000	1103119944	North Point Industrial Building			22
E29NW	6000	1103119910	Marble Road Telephone Exchange			4
N22NE	6200			×	×	0
N22SE	6200			×	×	0
N22SW	6200	1108225465	Ying Lun Building			10
N22NW	6200	1108225421	Furama Building			12
E30NE	6200	1103119981	Healthy Gardens Block C			27
E30SE	6200	1103120003	Healthy Gardens Block B			27
E30SW	6200		King's Road Playground	×	×	0
E30NW	6200		Flyover	×	×	0
N23NE	6400	1108224661	Kin Man Building			11
N23SW	6400	1108224764	Celebrity Commercial Centre			14
N23SW	6400	1108224941	Precious Blood Hospital		×	5
N23NW	6400	1108224749	127 Castle Peak Road			5
E31NE	6400	1103120007	Hong Shing Court			27
E31SE	6400	1103119962	Hong Cheung Court			27
E31SW	6400	1103119879	625 King's Road			25
E31NW	6400	1103119892	633 King's Road			35
N24NE	6600	1108224084	136-138 Castle Peak Road			5
N24SE	6600	1108224091	Wai Lee Commercial Building			13
N24SW	6600	1108224252	Hung Yu Mansion Block B			10
N24NW	6600	1108224142	Prince Theatre			4
E32NE	6600	1103120191	Man Cheung House			6
E32SE	6600	1103120117	AIA Hong Kong Tower			19
E32SW	6600	1103119955	Prosperity Millennia Plaza			27
E32NW	6600	1103120026	Harbour Plaza, North Point			27
N25NE	6800	1108223515	Hing Lung Building			11
N25SE	6800	1108223658	Apollo Building			10
N25SW	6800	1108223789	Spring Wide Mansion			12
N25NW	6800	1108223543	237 Castle Peak Road			10
E33NE	6800	1810186401	Golden Horse Mansion			27
E33SE	6800	1103120430	Mansion Building			13
E33SW	6800	1103120407	Lai Wah Mansion			13
E33NW	6800	1103120475	Ritz Garden Apartments			11
N26NE	7000	1108223046	278 Castle Peak Road			5
N26SE	7000	1108223049	276 Castle Peak Road			5
N26SW	7000	1108223170	291 Castle Peak Road			6
N26NW	7000	1108223154	293 Castle Peak Road			5
E34NE	7000	1103121003	Quarry Bay Station		×	3
E34SE	7000	1103120983	North Point Government Primary School		×	9
E34SW	7000	1103120812	Wai Fong Court			23
E34NW	7000	1103120796	Tor Po Mansion			9
N27NE	7200	1810145002	Heya Star Tower 2			31
N27SE	7200	1108222564	Shun Lee Commercial Building			23
N27SW	7200	1108222663	363 Castle Peak Road			8
N27NW	7200	1108222641	Po Sang Bank Building			11
N28NE	7400	1108222012	Kincheng Commercial Centre			25

N28SE	7400	1108222229	Tone King Building	26
N28SW	7400	1810142493	Heya Delight	33
N28NW	7400	1108222109	Florence Plaza	36
N29NE	7600	1108222026	Por Yen Building	14
N29SE	7600	1108222031	Park Building	22
N29SW	7600	1108222149	Federal Mansion Block A	12
N29NW	7600	1108222206	473 Castle Peak Road	9
N30NE	7800	1108222285	Peninsula Tower	26
N30SE	7800	1108222155	V GA Building	20
N30SW	7800	1108222376	Lai Cheong Factory Building	8
N30NW	7800	1108222452	Hong Kong Spinners Industrial Building Phase VI	10
N31NE	8000	1108222607	Fung Wah Factorial Building	7
N31SE	8000	1108222447	Wing Kut Industrial Building	12
N31SW	8000	1108222674	Kowloon Plaza	17
N31NW	8000	1108222796	Hong Kong Spinners Industrial Building Phase I And II	10
N32NE	8200	1108222836	Ka Ming Court	12
N32SE	8200	1108222878	Trendy Centre	34
N32SW	8200	1108223122	Hong Kong Industrial Centre Block A	12
N32NW	8200	1108223015	Hong Kong Industrial Centre Block B	12
N33NE	8400	1108223041	Hop Hing Industrial Building	13
N33SE	8400	1108223284	International Industrial Building	12
N33SW	8400	1108223054	Charm Centre	16
N33NW	8400	1108223340	Tong Yuen Factory Building	12

## 8.2 Processed Data

### 8.2.1 North Transect

Code	Distance from PLVI (m)	Mean number of storeys (errors and outliers removed)	Spearman Rank Correlation Calculations			
			Rank of distance	Rank of number of storeys	$d^2$	
0	1800	23.5	1	32	961	
1	2000	19.3	2	29	729	
2	2200	13.5	3	13	100	
3	2400	18.0	4	24	400	
4	2600	11.5	5	8	9	
5	2800	17.8	6	23	289	
6	3000	15.3	7	19	144	
7	3200	15.0	8	18	100	
8	3400	14.0	9	15	36	
9	3600	19.3	10	28	324	
10	3800	16.0	11	20.5	90.25	
11	4000	22.3	12	30	324	
12	4200	24.3	13	33	400	
13	4400	18.8	14	26	144	
14	4600	23.0	15	31	256	
15	4800	18.5	16	25	81	
16	5000	19.0	17	27	100	
17	5200	16.3	18	22	16	
18	5400	14.0	19	15	16	
19	5600	13.3	20	11.5	72.25	
20	5800	10.0	21	3.5	306.25	
21	6000	11.5	22	8	196	
22	6200	11.0	23	6	289	
23	6400	10.0	24	3.5	420.25	
24	6600	8.0	25	2	529	
25	6800	10.8	26	5	441	
26	7000	5.3	27	1	676	
27	7200	14.0	28	15	169	
28	7400	25.5	29	34	25	
29	7600	14.3	30	17	169	
30	7800	16.0	31	20.5	110.25	
31	8000	11.5	32	8	576	
32	8200	12.0	33	10	529	
33	8400	13.3	34	11.5	506.25	
					$\sum d^2$	9533.5

**Table 8.** Processed data table for the north transect.

## 8.2.2 East Transect

Code	Distance from PLVI (m)	Mean number of storeys (errors and outliers removed)	Spearman Rank Correlation Calculations		
			Rank of distance	Rank of number of storeys	$d^2$
0	200				
1	400	29.0	1	25	576
2	600	25.5	2	17	225
3	800	32.5	3	28	625
4	1000				
5	1200	42.0	4	31	729
6	1400	35.0	5	29.5	600.25
7	1600	35.0	6	29.5	552.25
8	1800	21.8	7	12	25
9	2000	20.8	8	11	9
10	2200	31.5	9	27	324
11	2400	20.3	10	9.5	0.25
12	2600	22.5	11	13.5	6.25
13	2800	15.8	12	1	121
14	3000	20.3	13	9.5	12.25
15	3200	18.8	14	6	64
16	3400	27.8	15	23	64
17	3600	18.5	16	5	121
18	3800	24.5	17	15	4
19	4000				
20	4200				
21	4400	29.8	18	26	64
22	4600	25.7	19	18	1
23	4800	26.3	20	20	0
24	5000	25.8	21	19	4
25	5200	24.8	22	16	36
26	5400	18.3	23	4	361
27	5600	27.3	24	22	4
28	5800	19.5	25	7	324
29	6000	22.5	26	13.5	156.25
30	6200	27.0	27	21	36
31	6400	28.5	28	24	16
32	6600	19.8	29	8	441
33	6800	16.0	30	2.5	756.25
34	7000	16.0	31	2.5	812.25
$\sum d^2$					9533.5

**Table 9.** Processed data table for the east transect.

### 8.2.3 South Transect

Code	Distance from PLVI (m)	Mean number of storeys (errors and outliers removed)	Spearman Rank Correlation Calculations		
			Rank of distance	Rank of number of storeys	$d^2$
0	200	49.0	1	5	16
1	400	34.0	2	3	1
2	600	30.3	3	2	1
3	800	43.7	4	4	0
4	1000	58.5	5	6	1
5	1200	22.0	6	1	25
$\sum d^2$					9533.5

Table 10. Processed data table for the south transect.

### 8.2.4 West Transect

Code	Distance from PLVI (m)	Mean number of storeys (errors and outliers removed)	Spearman Rank Correlation Calculations		
			Rank of distance	Rank of number of storeys	$d^2$
0	200				
1	400	30.0	1	15.5	210.25
2	600	20.8	2	8	36
3	800	22.8	3	11	64
4	1000	23.7	4	13	81
5	1200	20.5	5	7	4
6	1400	25.0	6	14	64
7	1600	22.5	7	10	9
8	1800	19.3	8	6	4
9	2000	18.0	9	5	16
10	2200	12.8	10	2	64
11	2400	12.5	11	1	100
12	2600	16.3	12	4	64
13	2800	16.0	13	3	100
14	3000	30.0	14	15.5	2.25
15	3200	23.0	15	12	9
16	3400	21.5	16	9	49
$\sum d^2$					9533.5

Table 11. Processed data table for the west transect.

## 8.2.5 Combined

Code	Distance from PLVI (m)	Mean number of storeys (errors and outliers removed)	Spearman Rank Correlation Calculations		
			Rank of distance	Rank of number of storeys	$d^2$
1	200				
2	400	29.5	1	40	1521
3	600	24.9	2	37	1225
4	800	24.4	3	36	1089
5	1000	23.7	4	31	729
6	1200	24.3	5	35	900
7	1400	28.3	6	39	1089
8	1600	26.7	7	38	961
9	1800	21.5	8	26	324
10	2000	20.3	9	21	144
11	2200	20.4	10	22	144
12	2400	16.7	11	11	0
13	2600	17.8	12	13	1
14	2800	16.5	13	10	9
15	3000	21.1	14	25	121
16	3200	18.1	15	14	1
17	3400	22.8	16	29	169
18	3600	18.9	17	18	1
19	3800	18.8	18	17	1
20	4000	22.3	19	28	81
21	4200	24.3	20	33.5	182.25
22	4400	24.3	21	33.5	156.25
23	4600	24.1	22	32	100
24	4800	21.9	23	27	16
25	5000	22.9	24	30	36
26	5200	20.5	25	23	4
27	5400	18.6	26	16	100
28	5600	20.3	27	20	49
29	5800	14.8	28	8	400
30	6000	13.6	29	5	576
31	6200	19.0	30	19	121
32	6400	20.6	31	24	49
33	6600	13.9	32	6	676
34	6800	13.4	33	4	841
35	7000	8.8	34	1	1089
36	7200	18.3	35	15	400
37	7400	30.0	36	41	25
38	7600	14.3	37	7	900
39	7800	16.0	38	9	841
40	8000	11.5	39	2	1369
41	8200	17.5	40	12	784
42	8400	13.3	41	3	1444
$\sum d^2$					9533.5



**Table 12.** Processed data table for all combined transects.