Data Presentation.

Survey 1: There will be less Functional Zoning of food outlets as you go away from the CBD and PLVI

Figure 3.1: a map showing the location of food outlets in the town of Stratford-upon-Avon

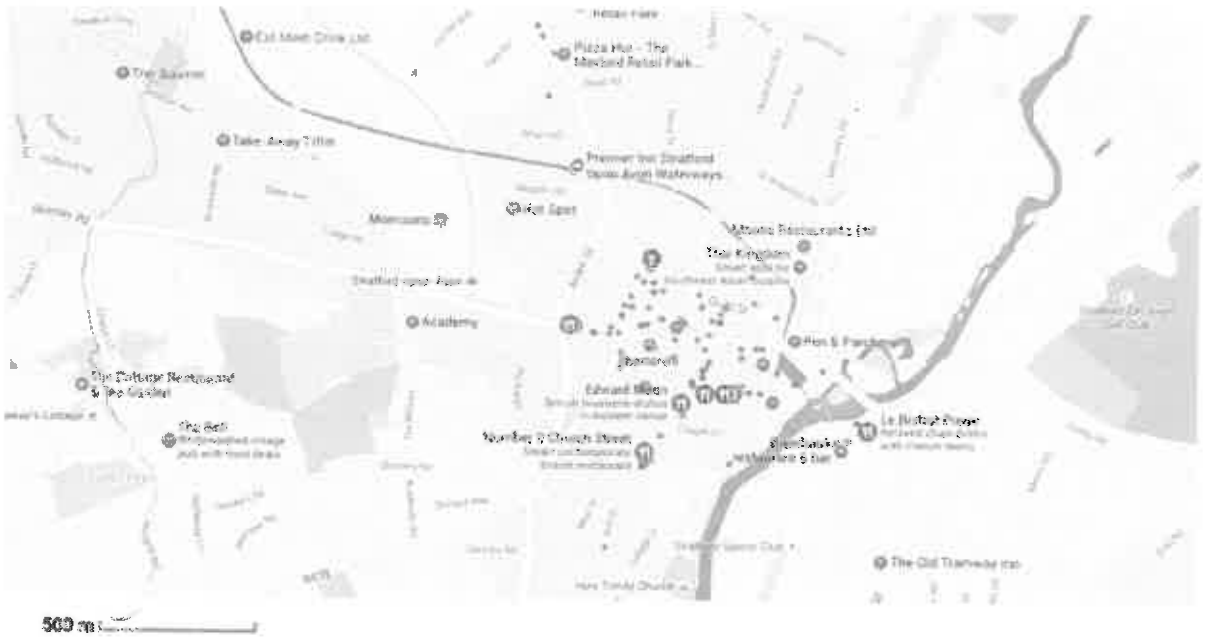


Figure 3.2

A choropleth map showing the location of food outlets in Stratford-upon-Avon CBD

Figure 3.3: A nearest neighbour analysis for food outlets in each of the four functional zones

Restaurants in CBD	Distance to nearest neighbour
Zizzi	0
Barnaby's	0.3
Café Rouge	0
The Opposition Restaurant	0
Lambs of Sheep Street	0.0
No 37 café	0.3
The Golden Bee	0.2
Loxley's Restaurant	0.3
Fresh Baguette Bar	0.4
Edward Moon	0.2
Giggling Squid	0.2
Othello's Bar And Restaurant	0.3
Mercure	0.6
Dirty Duck	0.5
Number 9 Church Street	0.2
The Windmill Inn	0.3
Pizzaluxe	0.4
Pizza Express	0.3
Sorrento restaurant	0.5
Lamplighter	0.2
Prezzo	0.3
Bella Italia	0
Gourmet Carvery	0.3
Midas Café bar	0.2
Essence	0.6
Ask Restaurants	0.5
McDonalds	0
Carluccio's	0.2
The Red Lion	0.0
Marlowes	0.4
Costa	0.2
Bamboodle	0.4
Chadds	0.5
The Hole In The Wall	0.4
Loft Restaurant	0.2
Tapas Fridays	0.0
Box Brownie	0.0
El Greco	0.5
Oddy's	0.4

Fresh'n'Funky	0.5
No 1 Shakespeare Street	0.3
Greek Connection	0.6
Studio 49	0.0
Hot Spot	0.2
Average: (44 Food Outlets)	0.27

Nearest Neighbour analysis: I can calculate a nearest neighbour index by using the equation below, the index will indicate the level of clustering between the restaurants where 0 means completely clustered, 1 means randomly positioned and 2.15 means regularly spaced.

Nearest Neighbour Statistic: $R_n = 2\bar{d}\sqrt{\frac{n}{a}}$

Where:

R_n = the nearest neighbour statistic

$\bar{d}$ = the mean observed nearest neighbour distance

n = the total number of points

a = the total area

Area: 30.32 cm2

$R_n = 2*0.27*\sqrt{(44/30.32)}$

$R_n = 0.65$ (3 d.p)

CBD: our result is 0.65 showing fairly random spacing

Inner City food Outlet Name	Nearest Neighbour
Flat Chicken	2.7
Must Go	0.5
Il Moro Ristorante	1.1
The Buzz Café	0.5
HR coffee And Catering	1.8
Jimmy Spices	1.8
Benson's Restaurant And Tea Rooms	2.7
Dolphin Fish Bar	0.2
Avon Spice	0.2
The One Elm	0.9
Thai Kingdom	1.5
Moon's Restaurant	1.5

Pizza Hut Maybird	0.7
The Big Fish	0.8
Costa Coffee Maybird	0.7
Subway Maybird	0.8
Tesco Superstore Café	1.8
Riverbank Restaurant	2.3
The View	1.4
The Bear	1.4
Le Bistrot Pierre	2.3
Avon Boating	2.2
The Arden Hotel	1.9
Rooftop Restaurant And Bar	1.9
The Countess Of Evesham	2.2
The Pen And Parchment	0.9
The Lazy Cow	1.4
Average: (27 Outlets)	1.37

Nearest Neighbour analysis: I can calculate a nearest neighbour index by using the equation below, the index will indicate the level of clustering between the restaurants where 0 means completely clustered, 1 means randomly positioned and 2.15 means regularly spaced.

Area 43.57cm2

$R_n = 2*1.37*\sqrt{(27/43.57)}$

$R_n = 2.14$

Nearest Neighbour Statistic: $R_n = 2\bar{d}\sqrt{\frac{n}{a}}$

Where:

R_n = the nearest neighbour statistic

$\bar{d}$ = the mean observed nearest neighbour distance

n = the total number of points

a = the total area

Inner Suburbs food outlets	Nearest neighbour
Usha	8.9
Domino's Pizza	7.2
Muffin Break	7.2
Average:	7.76

Nearest Neighbour Statistic: $R_n = 2\bar{d}\sqrt{\frac{n}{a}}$

Where:

R_n = the nearest neighbour statistic

$\bar{d}$ = the mean observed nearest neighbour distance

n = the total number of points

a = the total area

Area= 150.69cm2

$R_n = 2*7.76 *\sqrt{(3/150.69)}$

$R_n = 2.19$

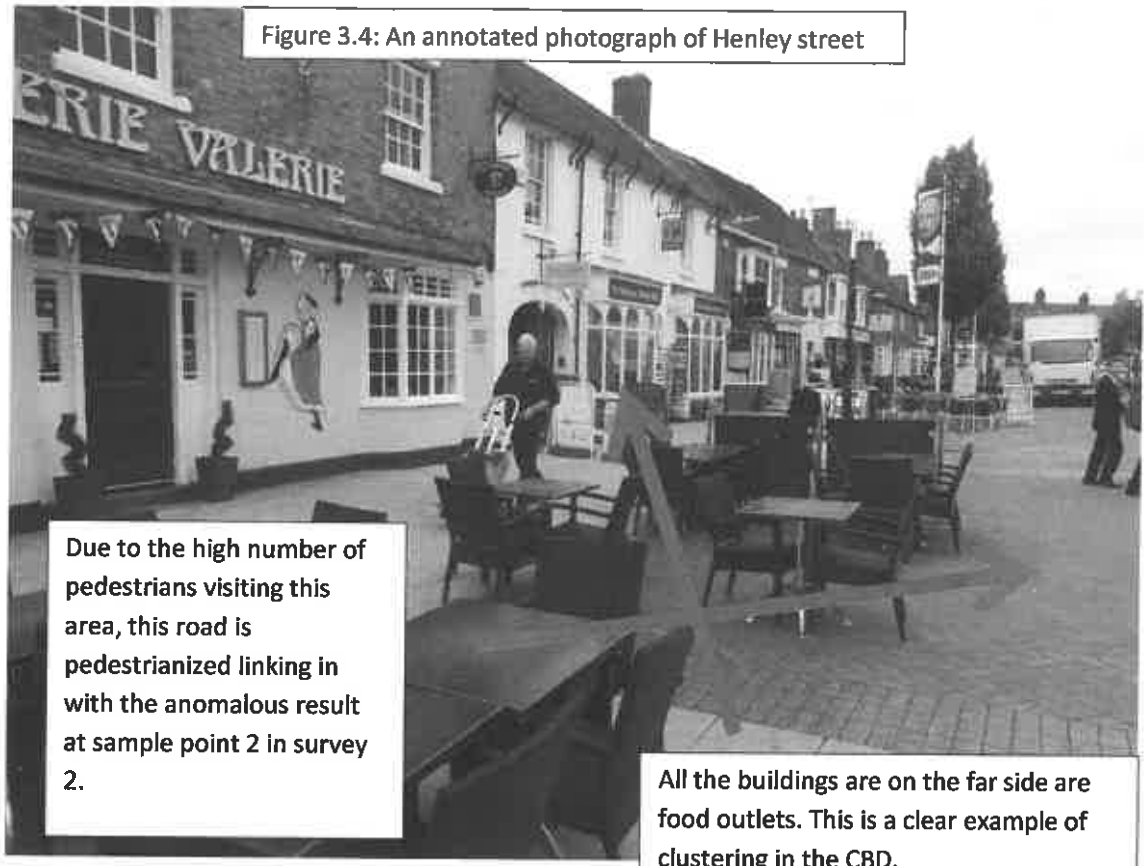
Outer Suburbs food outlets	Nearest neighbour
The Bell	16.2
Café Chutney	16.2
Average:	16.2

Area= 315.87cm2

$R_n = 2*16.2 *\sqrt{(2/315.87)}$

$R_n = 2.58$

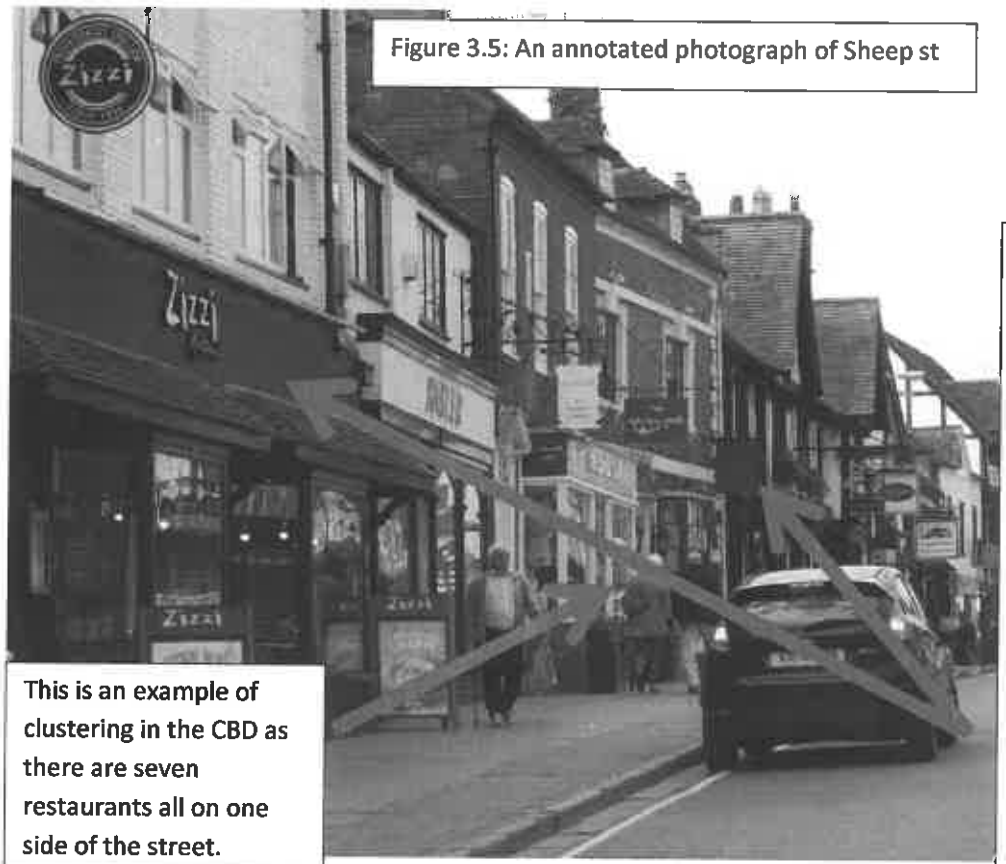
Figure 3.4: An annotated photograph of Henley street



Due to the high number of pedestrians visiting this area, this road is pedestrianized linking in with the anomalous result at sample point 2 in survey 2.

All the buildings are on the far side are food outlets. This is a clear example of clustering in the CBD.

Figure 3.5: An annotated photograph of Sheep st



This is an example of clustering in the CBD as there are seven restaurants all on one side of the street.

The restaurants that cluster are different types so one area can have more variety, creating more demand and leading to an increase in demand. This leads to them gathering in the CBD which will therefore have more traffic. The increase in revenue leads to an EQI boost towards the PLVI as these areas have more money to spend on appearance.

"There will be a decrease in traffic flow the further from the PLV."

Figure 3.6: Survey 2: A data collection sheet to see the number of vehicles the further away from the PLV

M from PLV	Cars	Buses	Lorries	Others(vans)	Total
0 PLV	37	4	2	5	48
50 Residential zone	0	0	0	1	1
100 Cinema road(small)	20	0	2	5	27
200 INNER CITY	29	1	1	3	34
300 4 way junction	37	1	1	5	44
400 Major arterial route	42	1	1	3	47
500	34	2	3	2	41
600 Industrial zone area	30	1	5	10	46
700 mapbird	45	4	5	8	62
800 mapbird	47	3	4	9	63
900 Inner suburbs	28	0	2	6	36
1000	24	0	1	5	30
1100	21	1	0	5	27
1200	19	2	0	1	22
1300	15	0	1	2	19
1400 Outer suburbs	8	0	0	1	9
1500	4	0	1	0	5
1600	3	1	0	0	4
1700	0	0	0	0	0
1800	1	0	0	0	1

FIGURE 3.7 - A Spearman's rank for survey 2: It shows the correlation between the distance from the PLVI and the number of vehicles in a minute. The correlation is **0.59** which is an above average positive correlation.

$$r_s = 1 - \frac{6\,(\sum d^2)}{n\,(n^2 - 1)}$$

$$1 - \frac{6 \times 541}{20^3 - 20} = 0.59323$$

Sample point	Distance From PLVI(m)	Rank A	Number of vehicles (per minute)	Rank B	Difference between ranks	Difference squared
1	0	1	48	3	-2	4
2	50	2	1	18.5	-16.5	272.25
3	100	3	27	11.5	-8.5	72.25
4	200	4	34	9	-5	25
5	300	5	44	6	-1	1
6	400	6	47	4	2	4
7	500	7	41	7	0	0
8	600	8	46	5	3	9
9	700	9	62	2	7	49
10	800	10	63	1	9	81
11	900	11	36	8	3	9
12	1000	12	30	10	2	4
13	1100	13	27	11.5	1.5	2.25
14	1200	14	22	13	1	1
15	1300	15	19	14	1	1
16	1400	16	9	15	1	1
17	1500	17	5	16	1	1
18	1600	18	4	17	1	1
19	1700	19	0	20	1	1
20	1800	20	1	18.5	1.5	2.25

Sum of difference squared: 541

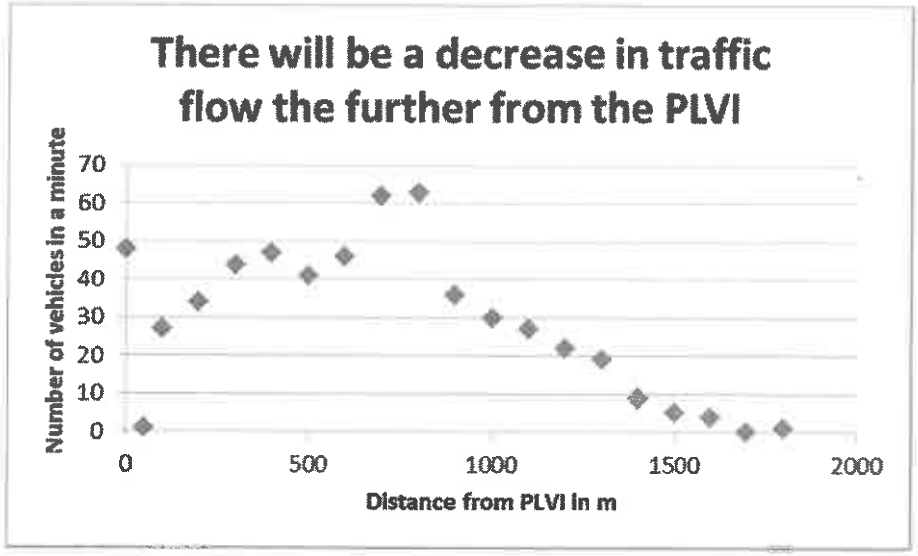
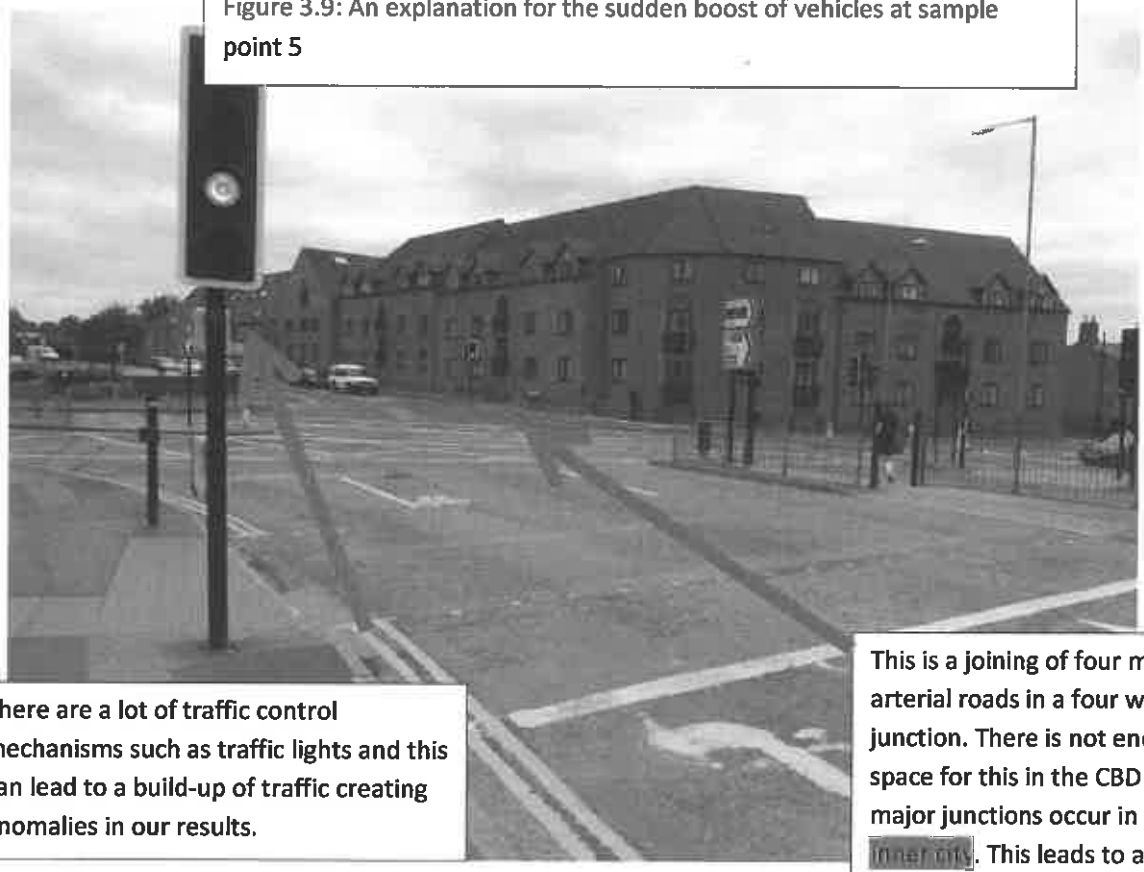


Figure 3.8: A scatter graph to show the correlation between distance from PLVI and number of vehicles in a minute.

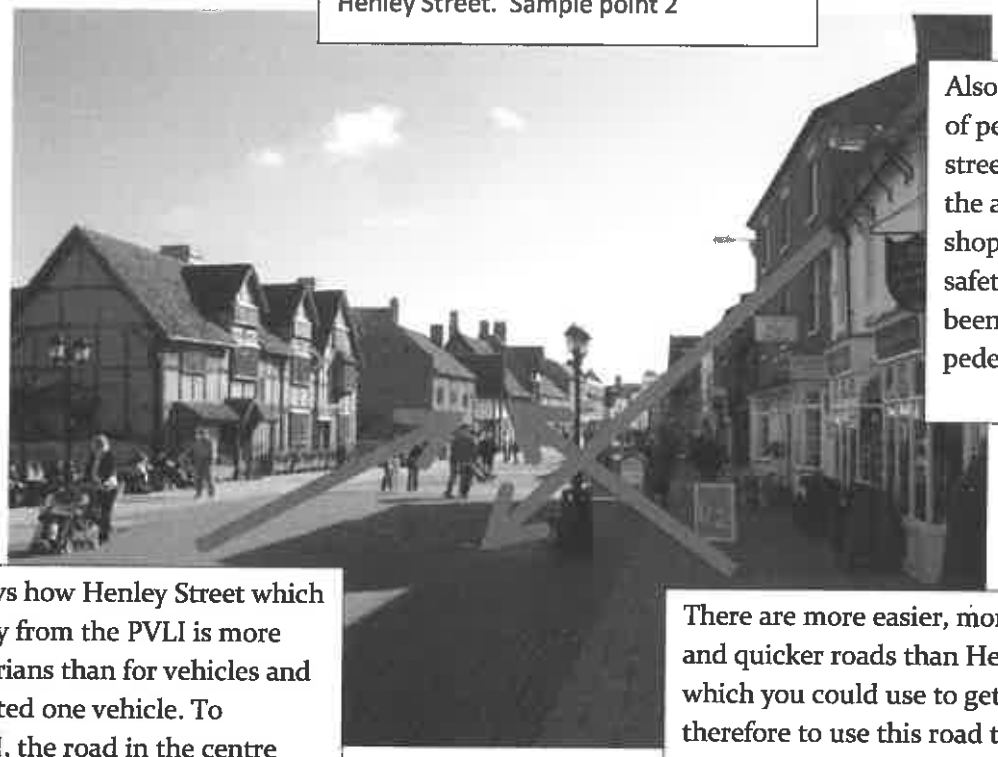
Figure 3.9: An explanation for the sudden boost of vehicles at sample point 5



There are a lot of traffic control mechanisms such as traffic lights and this can lead to a build-up of traffic creating anomalies in our results.

This is a joining of four major arterial roads in a four way junction. There is not enough space for this in the CBD so the major junctions occur in the inner city. This leads to a boost in the number of vehicles after the CBD going against my hypothesis.

Figure 3.10: Annotated picture of the Henley Street. Sample point 2

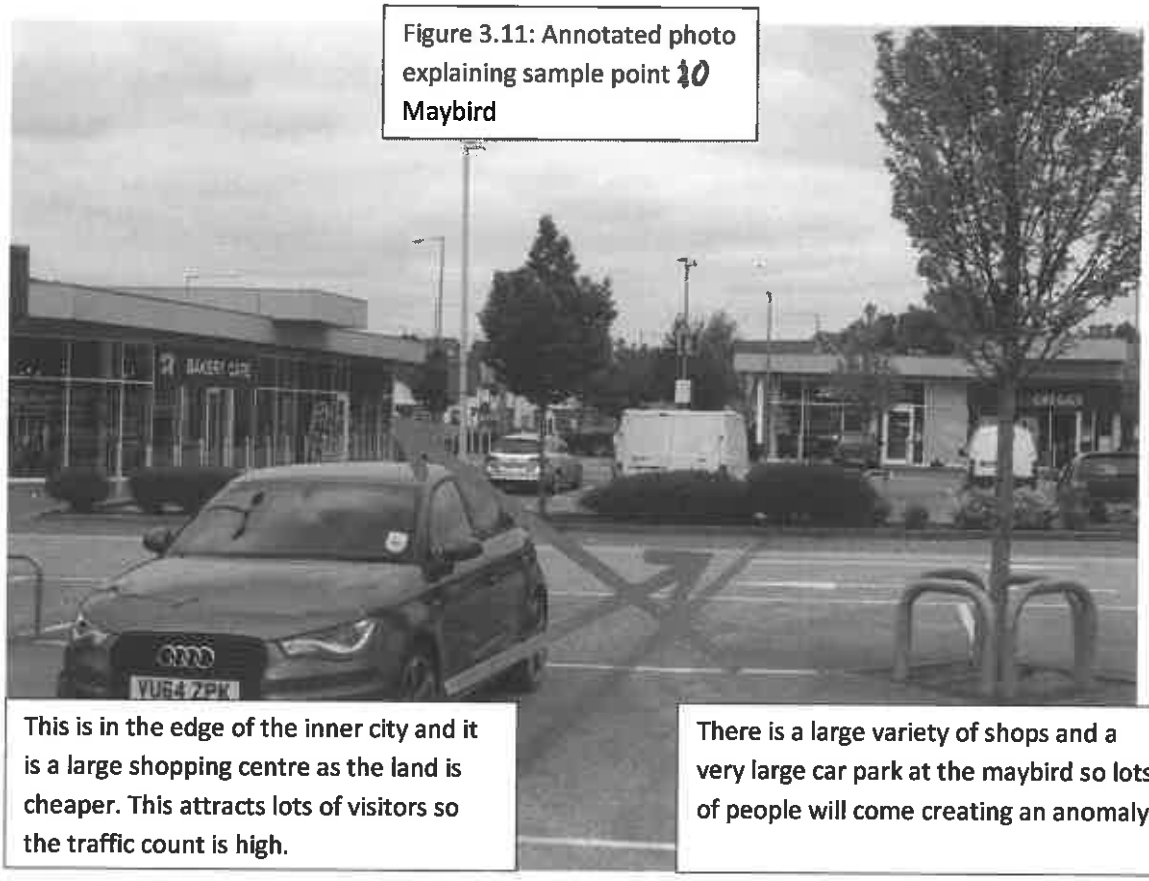


Also there are lots of people on this street coming for all the amenities and shops and so for safety the road has been pedestrianized.

This image shows how Henley Street which is only 50m away from the PVLI is more suited to pedestrians than for vehicles and so we only counted one vehicle. To improve the EQI, the road in the centre has been pedestrianized meaning it was an anomaly in our investigation

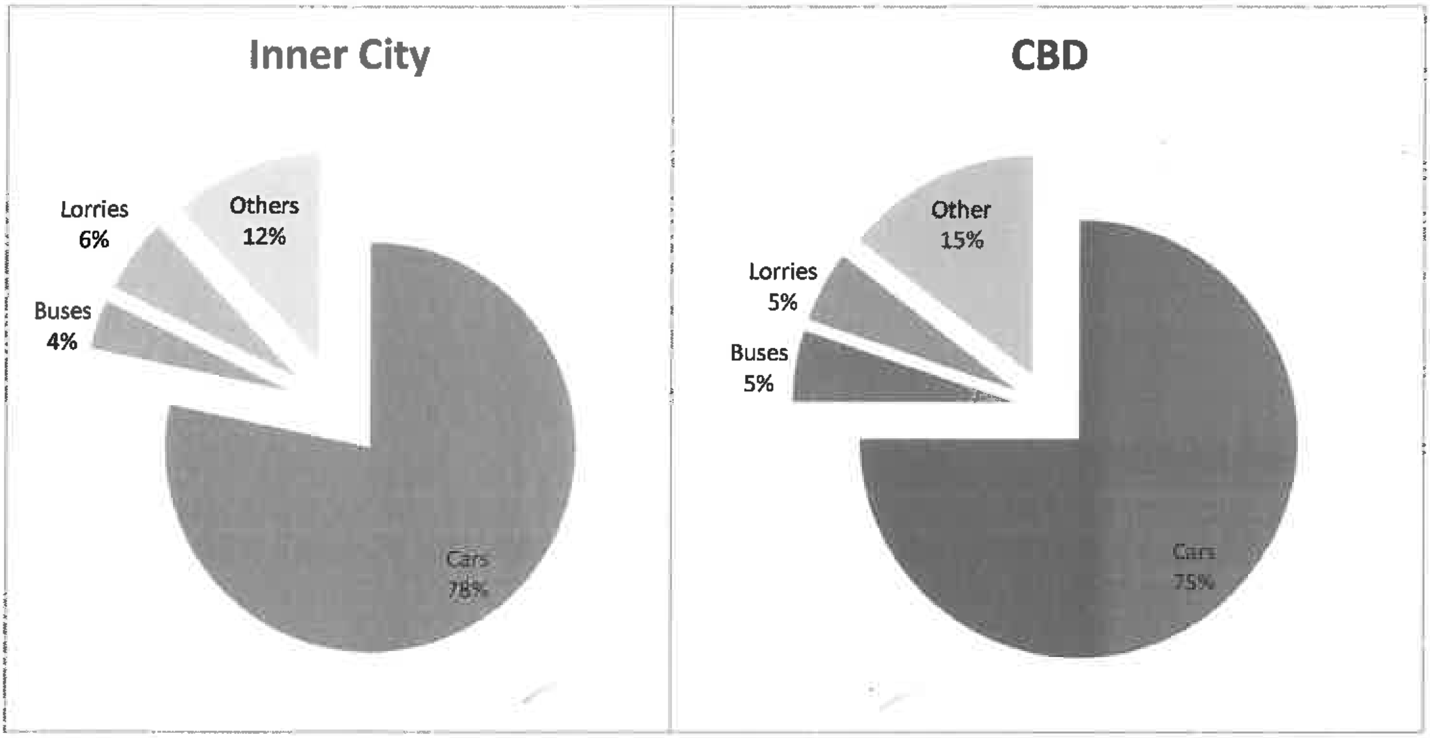
There are more easier, more accessible and quicker roads than Henley Street which you could use to get to the PVLI therefore to use this road to get to it would be unnecessary.

Figure 3.11: Annotated photo explaining sample point 10 Maybird

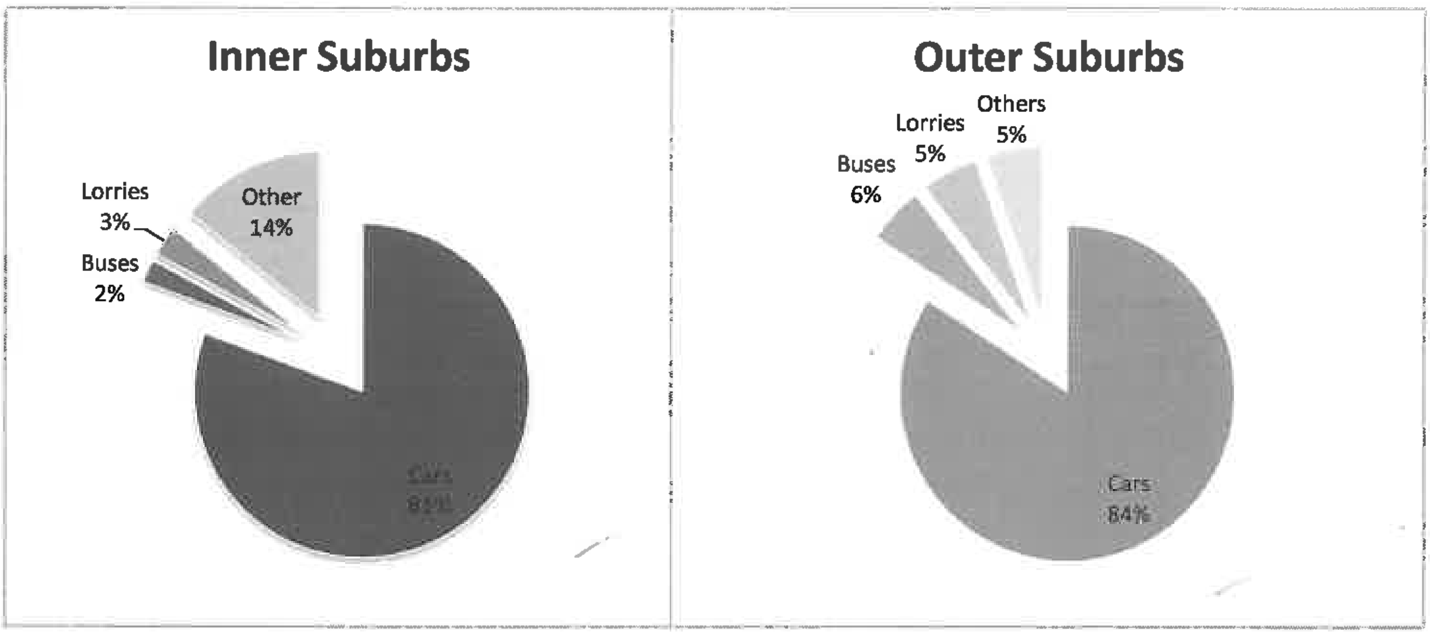


This is in the edge of the inner city and it is a large shopping centre as the land is cheaper. This attracts lots of visitors so the traffic count is high.

There is a large variety of shops and a very large car park at the maybird so lots of people will come creating an anomaly



<u>Figure 3.12:</u> Pie Charts to show the change in types of traffic across the four functional zones.



Survey 3: There will be a change in EQI across the four functional areas of Stratford.

CBD Average	High +2	High +1	Average +0	Poor -1	Poor -2	
	1	1	1	1	1	
No Vandalism Evident	IIII	IIII	II			Lots Of Vandalism
Good Condition	IIII	IIIII	I			Poor Condition
Open Spaces & Gardens	II	II	II	III	II	No Open Spaces Or Gardens
Well Designed Buildings	III	III	I	I	II	Poorly Designed / Ugly Buildings
No Graffiti	III	IIII	II	I		Lots Of Graffiti
No Chewing Gum/Litter	I	IIIIII	I	II		Lots Chewing Gum/Litter
No Traffic Noise		I	III	IIII	II	Lots Of Traffic Noise
Very Safe Crossings	II		III	IIIII		Dangerous Roads
No Congestion			IIIIIII	II	I	Heavy Congestion
Easy Parking		II	I	IIII	III	Difficult Parking – No Spaces
Close To Public Transport	IIII	I	IIIII			No Public Transportation
Close To Shops & Services	IIIIII	IIII				Far Away From Shops & Services
A Range Of Shops & Services	IIII	IIIIII				Poor Range Of Shops & Services
Well Maintained Pavements	IIII	II	IIII			Poorly Maintained Pavements

Figure 3.13: Table of results showing EQI in the CBD

Inner City Average	High +2	High+1	Average 0	Poor -1	Poor -2	
	1	1	1	1	1	
No Vandalism Evident	II	IIIII	II	I		Lots Of Vandalism
Good Condition	II	IIII	III	I		Poor Condition
Open Spaces & Gardens	III	I	III	III		No Open Spaces Or Gardens
Well Designed Buildings	II	I	II	III	II	Poorly Designed / Ugly Buildings
No Graffiti	III	IIIII	I	I		Lots Of Graffiti
No Chewing Gum/Litter		IIIII	II	III		Lots Chewing Gum/Litter
No Traffic Noise	III			IIIII	II	Lots Of Traffic Noise
Very Safe Crossings	III	III	III	II		Dangerous Roads
No Congestion	II	II	III	II		Heavy Congestion
Easy Parking	I	IIIIII	I		I	Difficult Parking – No Spaces
Close To Public Transport	I	IIIII	II	II		No Public Transportation
Close To Shops & Services	II	III	IIIII			Far Away From Shops & Services
A Range Of Shops & Services	II	IIIII	III			Poor Range Of Shops & Services
Well Maintained Pavements	III	III	III	I		Poorly Maintained Pavements

Figure 3.14: Table of results showing EQI in the [redacted]

Inner Suburbs Average	High +2	High+1	Average 0	Poor -1	Poor -2	
	1	1	1	1	1	
No Vandalism Evident	II	IIII	III		I	Lots Of Vandalism
Good Condition	II	IIIII	I	I	I	Poor Condition
Open Spaces & Gardens	II	IIIIIII	I			No Open Spaces Or Gardens
Well Designed Buildings		IIIII	II	III		Poorly Designed / Ugly Buildings
No Graffiti	IIII	I	IIII	II		Lots Of Graffiti
No Chewing Gum/Litter		IIII	I	IIII	I	Lots Chewing Gum/Litter
No Traffic Noise		IIII	II	III	I	Lots Of Traffic Noise
Very Safe Crossings	II	II	II	IIII		Dangerous Roads
No Congestion	I	IIII	II	III		Heavy Congestion
Easy Parking		IIIIII	II	II		Difficult Parking – No Spaces
Close To Public Transport	I	IIIIII	I	II		No Public Transportation
Close To Shops & Services	IIII	I	II	III		Far Away From Shops & Services
A Range Of Shops & Services	IIII	II	I	III		Poor Range Of Shops & Services
Well Maintained Pavements		IIIII	III	I	I	Poorly Maintained Pavements

Figure 3.15: Table of results showing EQI in the Inner suburbs

Outer Suburbs Average	High +2	High+1	Average 0	Poor -1	Poor -2	
	1	1	1	1	1	
No Vandalism Evident	IIIII	IIIII				Lots Of Vandalism
Good Condition	IIII	IIIIII				Poor Condition
Open Spaces & Gardens	IIIIIIII	I	I			No Open Spaces Or Gardens
Well Designed Buildings	I	IIIIIII	I			Poorly Designed / Ugly Buildings
No Graffiti	IIIIIIII	II				Lots Of Graffiti
No Chewing Gum/Litter	IIII	IIIII	I			Lots Chewing Gum/Litter
No Traffic Noise	III	III	II	II		Lots Of Traffic Noise
Very Safe Crossings	IIII	I	III	I		Dangerous Roads
No Congestion	III	IIIIII	I			Heavy Congestion
Easy Parking	III	IIII	I	I		Difficult Parking – No Spaces
Close To Public Transport	I	II	III	IIII		No Public Transportation
Close To Shops & Services		II	II	IIIIII		Far Away From Shops & Services
A Range Of Shops & Services		II	II	IIIII	I	Poor Range Of Shops & Services
Well Maintained Pavements		IIIII	III	II		Poorly Maintained Pavements

Figure 3.16: Table of results showing EQI in the Outer Suburbs. We used bi-polar

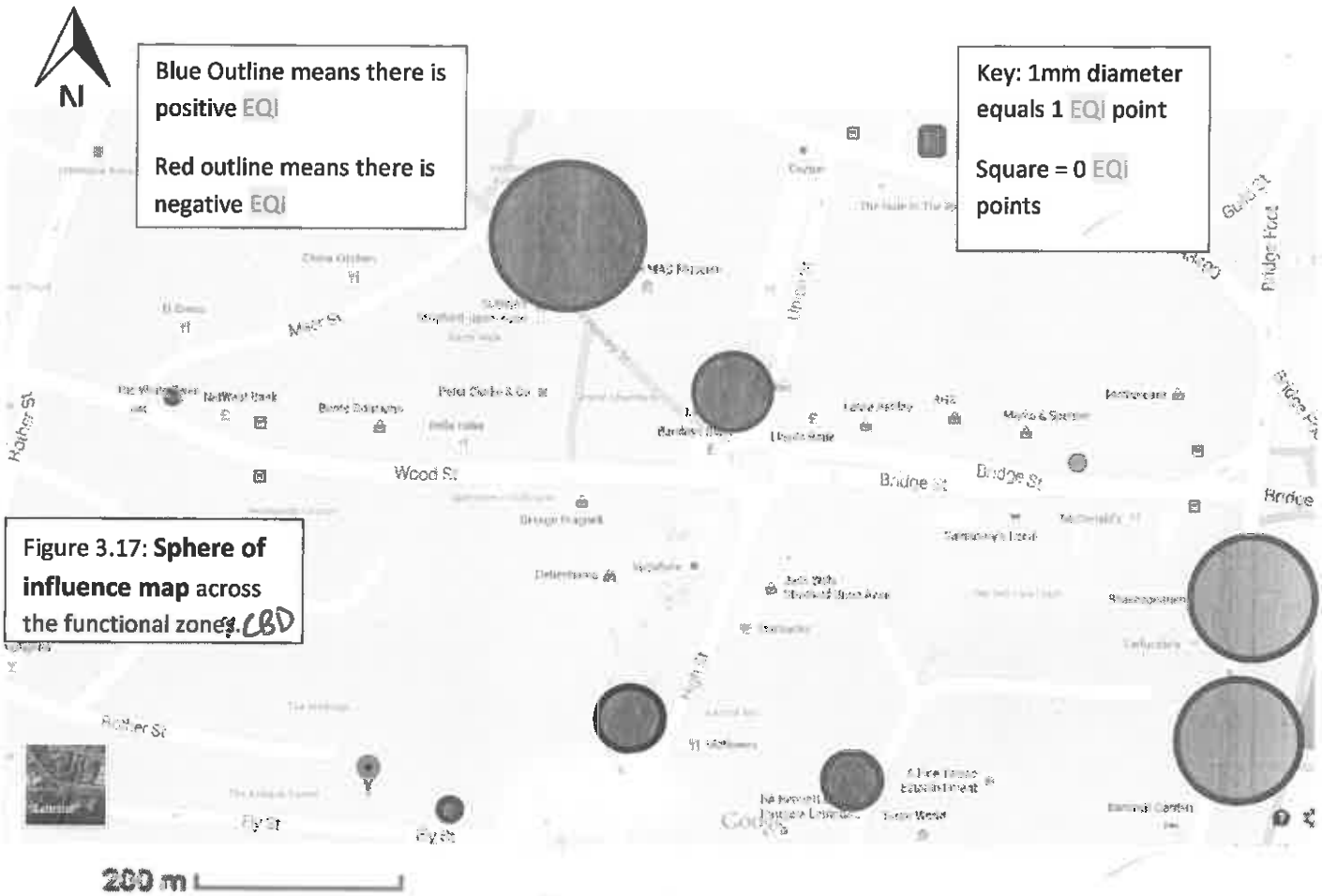


Figure 3.17: **Sphere of influence map** across the functional zones. CBD

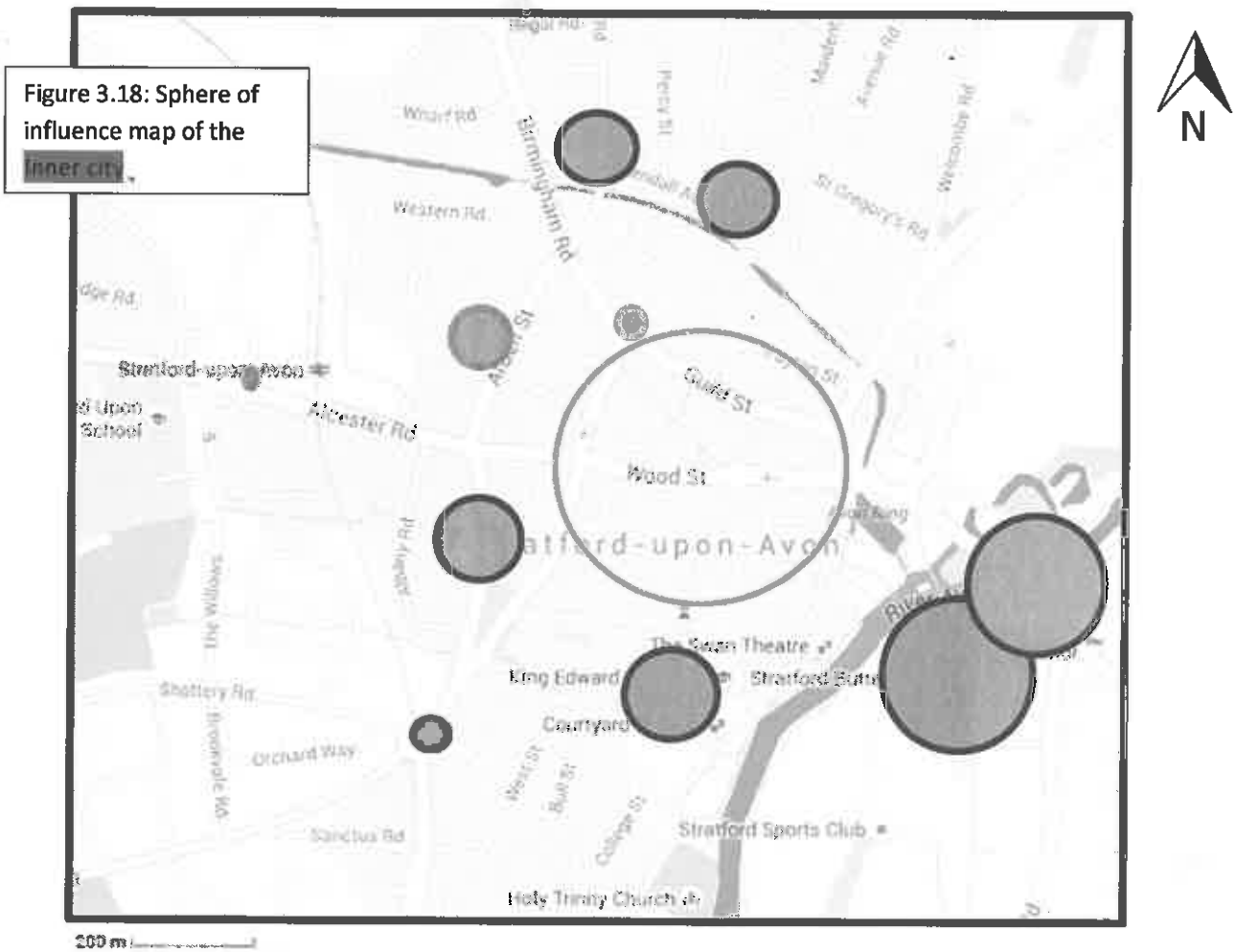


Figure 3.18: Sphere of influence map of the inner city

Figure 3.17: Sphere of influence map of the Inner suburbs

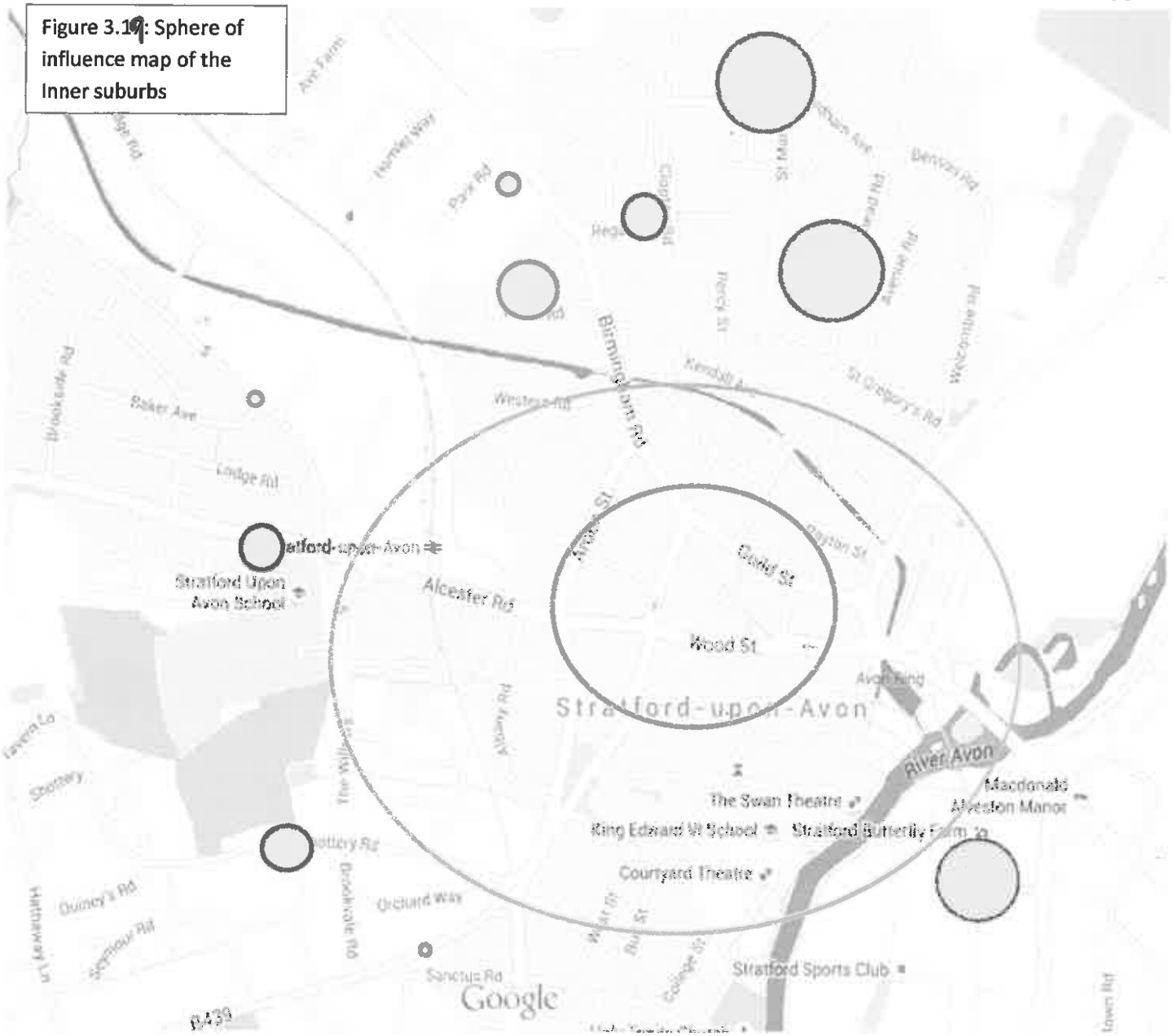


Figure 3.10: Sphere of influence map of the outer suburbs

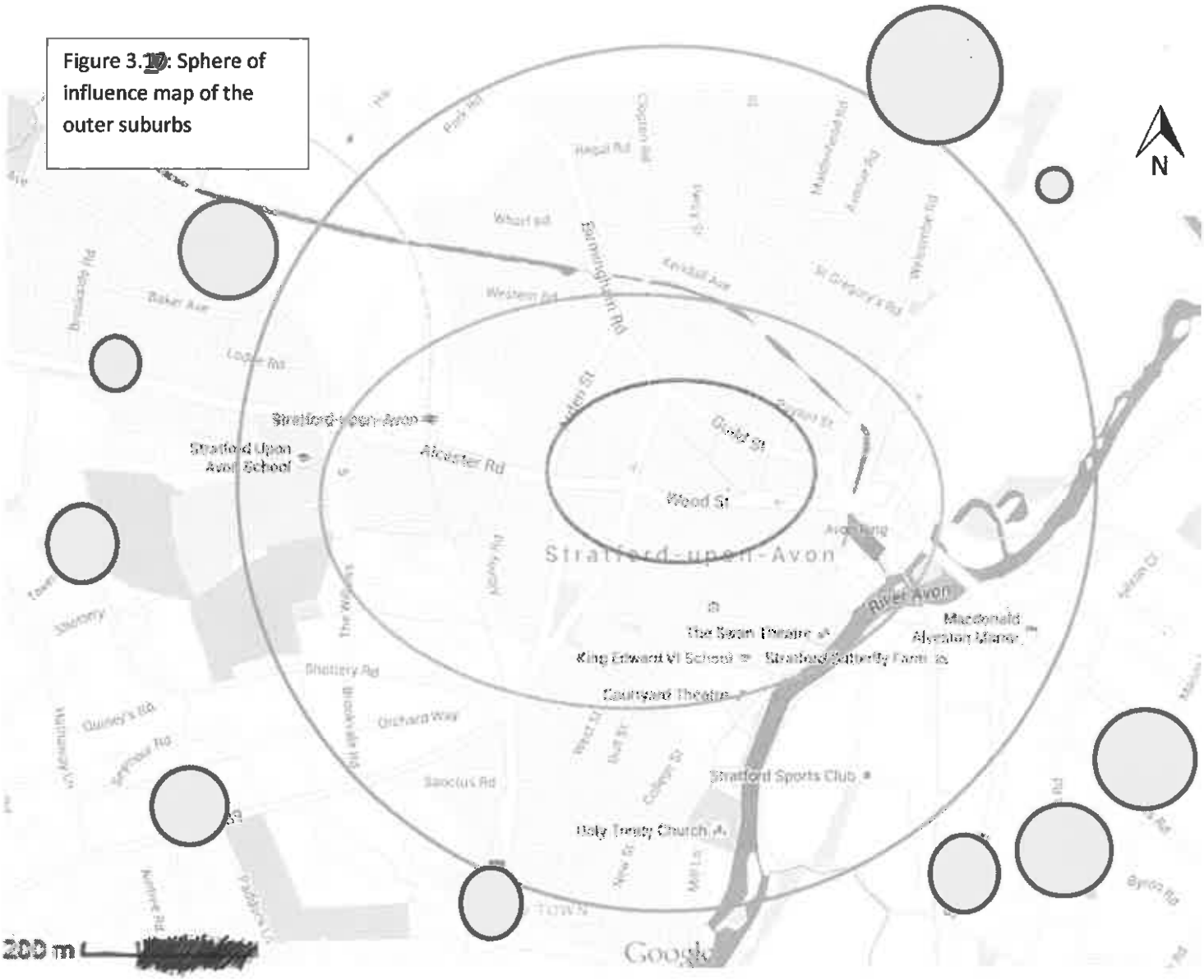


Figure 3.21: An annotated photograph of EQI in the outer suburbs.

This is a typical outer suburbs area. The houses have a back garden. This is because there is more land and it is cheaper. The houses are therefore larger.

There is a large amount of foliage and greenery. This typifies an outer suburb area. As there is a large amount of space, more parks and gardens are found here. This led to an increase in EQI as it is more natural and less urbanised

The path is a cycle or a pedestrian path. This is because there are fewer cars so no roads are necessary. Also this means the area is much safer for families with young children.