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GCSE Geography Coursework Edexcel Syllabus A

Index

How and why is land use changing within the El Raval area of Barcelona?

↑ Museu d'Art Contemporani (The Contemporary Art Museum) in Northern part of El Raval

El Raval is a medieval quarter of Barcelona, located in the region of Catalunya. (See map, page 6) This part of Barcelona used to be one of the most densely populated areas in the world and had one of the highest mortality rates among the Europe. However, recent government investments and urban regeneration carried out in El Raval have successfully and dramatically altered the social, economic and environmental landscape in the areas where urban regeneration has been carried out. The aim has been to change the whole area of El Raval to attract new people and to change the reputation of the city as a whole. Until now, the achievements are noticeable and highly successful and the urban regeneration scheme in El Raval is seen as one of the most successful schemes in the world. So by studying Barcelona, I am hoping to see the changes in the areas among El Raval and explain the causes and the effects of the urban regeneration scheme.

El Raval in Catalan means 'suburb'. This clearly supports the idea that during the Industrial Revolution, El Raval rapidly filled with tenement blocks for the workers from the countryside and factories, like textile mills, replacing the old industries such as brick making, slaughtering and tanning leather, which were not allowed in the residential part of Barcelona, Barri Gotic, in medieval time.

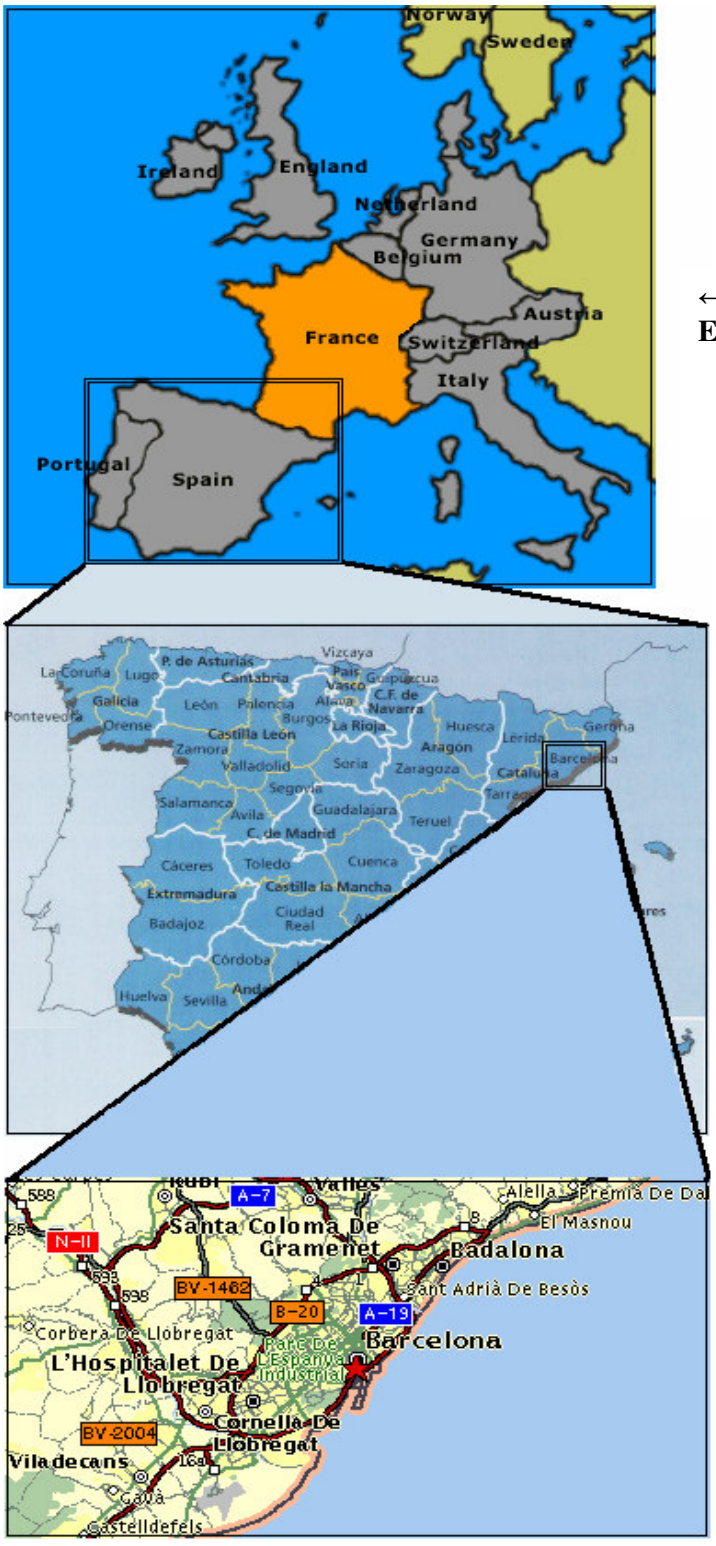
This is a classic example of an inner city area, where the inner city quarter was initially a suburb to place polluting industries as close as possible to the homes of the workers, all inside the city walls. Also the polluting industries had to be settled in El Raval, since it was the only available area left inside the city wall. Also the factories had to be built several storeys high to maximise the space, since the space available for each factory was small. From this stage to the 1860, the manufacturing activity had concentrated in the areas of El Raval, because they were not allowed to extend their industries outside the city walls. Starting from the urban development project to build Eixample in 1860, Barcelona started to grow outward. So the initial site for the polluting industries has become the inner city, where the housing is poor and of high density. This attracts present-day immigrants who do not have much money to settle on the wealthy areas in Barcelona and nowadays, most of El Raval contains large numbers of immigrants. The presence of immigrants, who do not speak Spanish and settle in the area with their native culture, makes El Raval an intimidating place to go for tourist and even for native Spanish people.

In order to improve the reputation of Barcelona and to make the city safer for both tourists and residents, the Generalitat de Catalunya, the government of Catalonia, has introduced the new urban regeneration scheme which was consisted of 'changing the area to change the people'. However, the Generalitat de Catalunya did not start this urban regeneration scheme in the centre of El Raval, but in the northern periphery of El Raval. This is due to the idea that since the northern part of El Raval is close to the wealthy city centre, it would be easier and less money would be needed to create changes than the centre of El Raval. So to start the regeneration scheme, the Generalitat de Catalunya built the Contemporary Art Museum and the Contemporary Culture Centre in the northern El Raval.

← A photograph of gentrified restaurant in northern part of El Raval, showing the increasing demand for healthy food.

Since the Generalitat's regeneration scheme consists of changing the land use to change the people, it is really important to identify the land use rather than carrying out lots of different surveys, because the change in land use shows the environmental, economic and social changes. So I hope to see from the land use data, how successful the urban regeneration scheme have been in different part of El Raval and I expect to see that the part where the investment has been the highest, would have more gentrified shops such as a specialised restaurant, which is shown in the photograph above. This means that the land value close to the Contemporary Art Museum (CAM) will be higher and the price of convenient items will be higher, compared to the areas further away from the CAM.

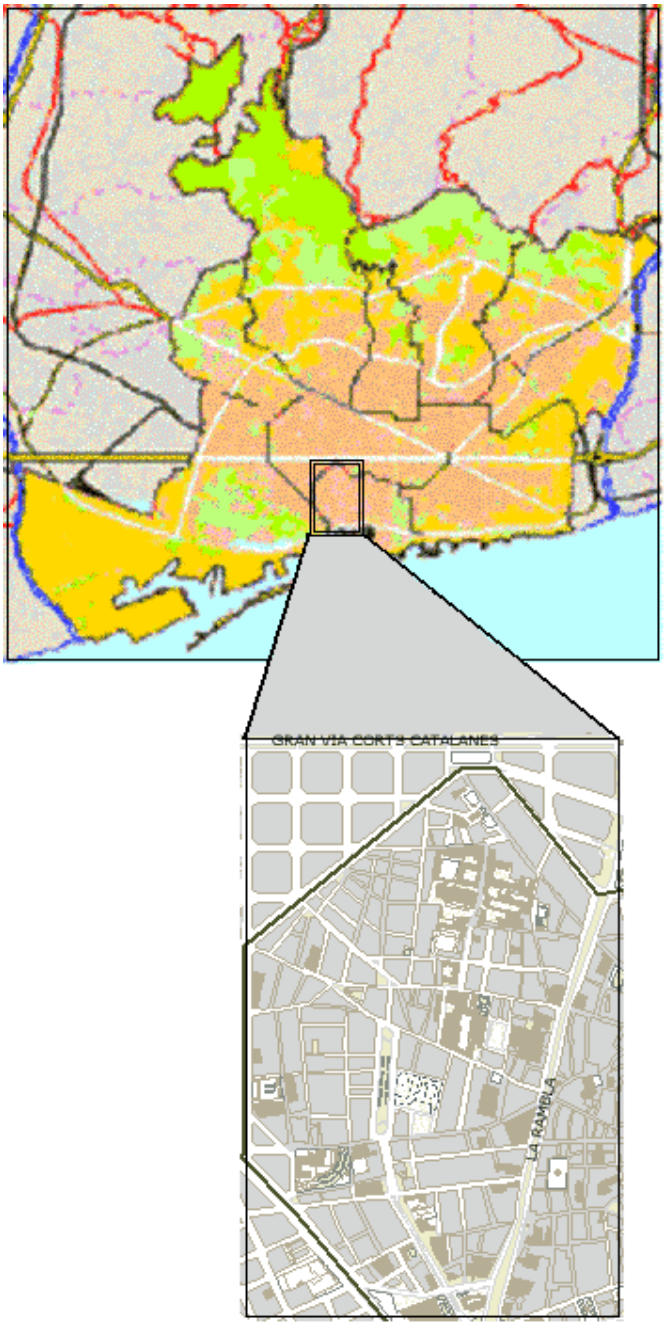
Location of El Raval



← Simplified Map of Europe

← Enlarged Map of Spain

← Enlarged Map of Barcelona Region



← Enlarged Map of Barcelona

← Enlarged Map of El Raval

Aims of the Study

In this investigation, the main aim is to identify the change in land use of distinctive parts of El Raval and to analyse the differences. In order to identify the changes in land use in different part of El Raval, I plan to undertake samples rather than a census, since the census takes long time to finish and I only have limited time available to collect all the data. So to use my time more effectively, I will use random sampling to save time as well as to avoid any bias. So I firstly have to separate the El Raval into different representative areas, which show distinctive characteristics compare to each other representative areas. I chose four representative areas, based on my previous pilot study, done by walking around the area and by looking at the census data, which shows four different characteristic zones. Having identified the representative areas, I will collect the environmental quality, perception survey and residential quality data as well as the land use mapping.

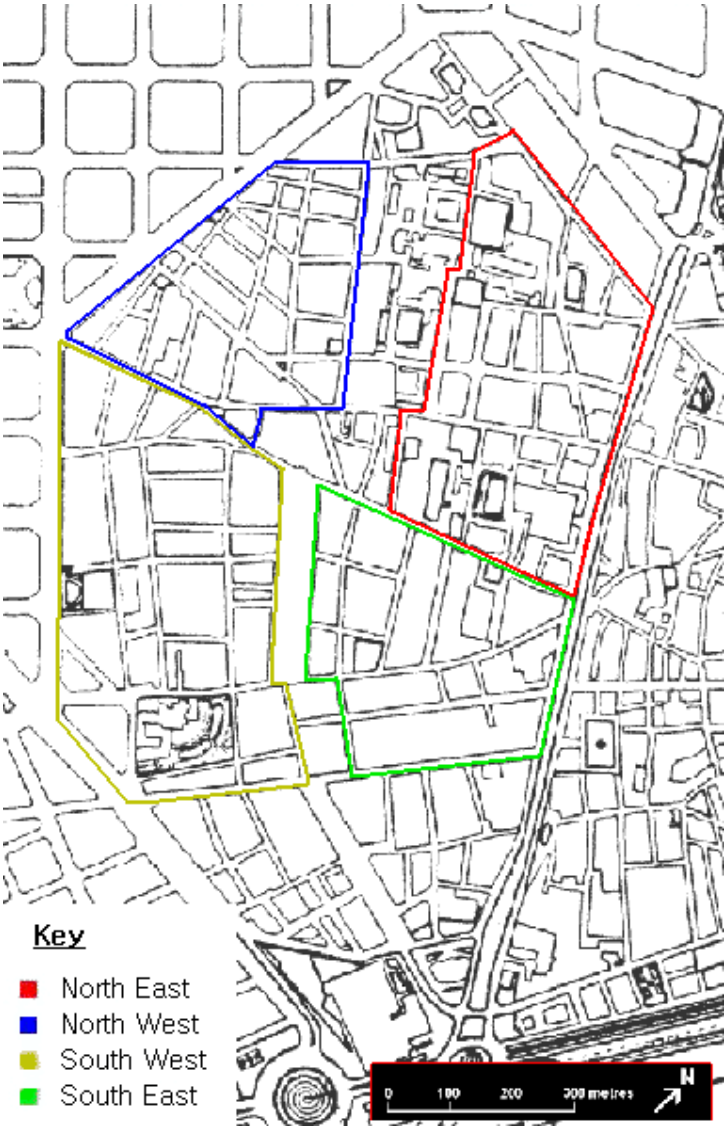
Once I collected all the data, I am going to compare the land use map with the historical records in order to identify the changes in land use as well as to compare the environmental quality, the perception survey, the land use mapping and the residential quality data between each representative area. Here, secondary data will be taken from the census and used to back up my results.

After comparing the data is done, I will conclude with overview of the investigation and evaluate my investigation.

Data Collection

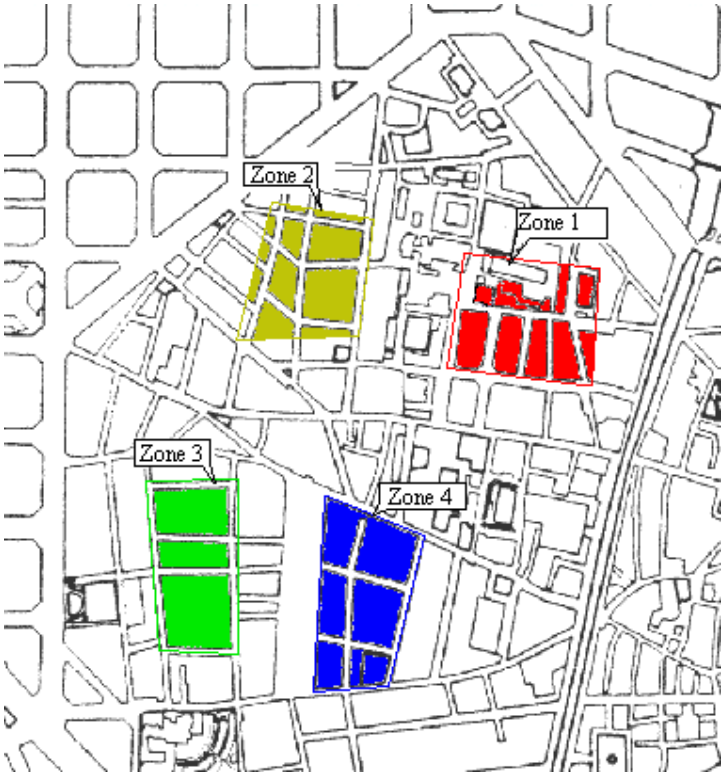
In this section of my investigation, I want to introduce the method used to identify social, environmental and economic changes in particular areas in El Raval. However, it is impossible to carry out a census to identify these changes under the limited time available. So I will take number of samples within the area of El Raval.

From the sample taken, it is necessary to ensure that each sample taken represents different characteristic of El Raval. So based on the pilot study, I could see that four different representative areas can be identified, all of them differ from each other socially, economically and environmentally. Four representative areas are shown in the map below.



← An enlarged map of El Raval showing four classified representative areas.

After identifying the representative areas, number grid is laid on each representative area to find the sampling zone in each area. The diagram on the side shows an example of number grid laid on the north-east representative area. This random sampling is necessary in order to avoid bias. Using a random number generator or using random button on the calculator, I selected a sampling zone from each representative area. The sampling zones are shown in the map below:



After I classified the sampling zone from each representative area, I have planned to do a land use mapping for each sampling area. Also I have prepared the worksheet for environmental quality, residential quality and perception survey. To fulfil this worksheets and the land use mapping, I first walked each area block by block. (See the appendix for the worksheet for residential quality, environmental quality and perception survey)

Residential Quality

For the residential quality worksheet, I have categorised main qualities into 6 features. The features are;

- Deterioration of Walls
- Part Peeling
- Broken Glass in Windows
- Structural Damage e.g. Settling Cracks
- Rotting Timber
- Broken Gutters.

In this survey, the buildings are judged with the features above. All the features show the physical state of the building in each zone. Each feature has different maximum score due to its different contribution to the state of building and high score in each feature means that the feature is not applied while I was judging the state of the buildings. So if the overall score is high, it means that the state of buildings in that zone is well-kept and if the overall score is low, the building perhaps need to be reconstructed or demolished.

Comparing residential quality data is important, since it shows the social changes within El Raval, which also affects the land use of that particular area.

Environmental Quality

The environmental quality of each zone is judged on many different qualities.

1. **Landscape Quality**

The area will be scored for whether the area has,

- Trees and well-kept grassed spaces
- Few tress and/or unkept grassed spaces
- No trees or grassed spaces

2. **Noise**

The area will be scored for whether the area has,

- Normal residential standard – quiet
- Above residential standard – with some noise
- Main street standard – very noisy

3. **Derelict (waste) land**

The area will be scored for whether the area has,

- No waste land
- Small area of waste land
- Large area of waste land

4. **Air Pollution**

The area will be scored for whether the area has,

- No offensive smells or obvious air pollution
- Offensive smells and/or obvious air pollution

5. **Litter / Vandalism**

The area will be scored for whether the area has,

- No litter / No vandalism
- Some litter or vandalism
- Much litter / Much vandalism

6. **Access to Recreational Amenities**

The area will be scored for whether the area has,

- Nearby/visible Park
- Some street seating, but no visible park
- No street seating or visible park

7. **Industrial Work Shop Premises**

The area will be scored for whether the area is consisted of,

- All residential properties
- Some work shops
- Mainly industrial work shops

8. **Traffic Flow**

The area will be scored for whether the area has,

- Normal residential traffic
- Above normal residential traffic
- Heavy vehicles and through traffic

The environmental quality survey is important in my investigation, because the Barcelona's urban regeneration scheme consists of 'changing the area to change the people' and the environmental quality reflects the environmental changes in the area, showing how successful the scheme has been.

Perception Survey

Perception survey is based on my personal opinion of the sampling areas, which are judged with both positive and negative features.

The positive features are,

- Rich
- Safe
- Friendly / Relaxed
- Improving
- Community Atmosphere
- Attractive Area

The negative features are,

- Poor
- Dangerous
- Declining
- Risk of Crime
- Unattractive Area
- Vandalised

Once the area has its total score for positive qualities and negative qualities, the overall score for each sampling zone is calculated and then compared with the other sampling areas. The perception survey reflects the impression the outsider would have of the sampling zones and also it shows the subjective impression of the economic characteristics in the sampling zones. So by comparing the sampling zones, it is possible to detect the economic change within El Raval.

Land Use Mapping

For the change in land use, I have prepared large-scale land use maps of each sampling zone. These maps will be completed once the residential quality, the perception survey and the environmental quality survey are done. To complete the land use mapping, I have walked the sampling area again, colour coding each block according to its type of services. The types of services are,

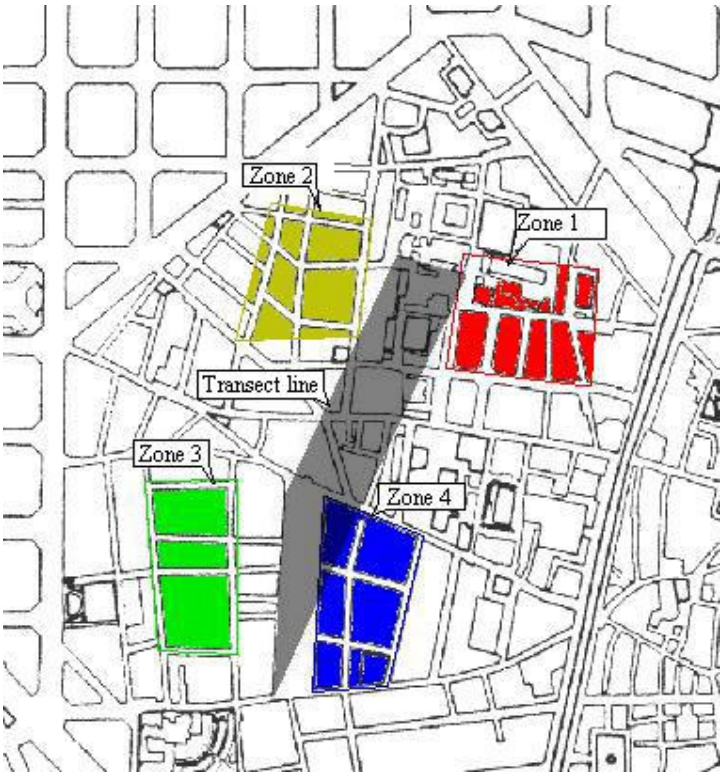
- Service for Local Residents (e.g. bars, supermarkets and pharmacies)
- Gentrified Services (e.g. specified and decorated restaurants)
- Work Shops
- Professional Services (e.g. Music studio)
- Training Centre (e.g. universities)
- Services of Poverty
- Religious Buildings
- Immigrant Services
- Parking
- Government Investments (e.g. public school)

Also I colour-coded the residences, closed services and demolished area, since it might be useful when I analyse the data I collected. Specially, the land use data for the residences, which represents the housing density, is important, because lower housing density means that the housing is expensive. So the area is better than the areas which have higher housing density, because many immigrants can not afford expensive housing.

The land use mapping is the main objective of my investigation and it will directly show the changes in land use, explaining the reasons for changes within El Raval with the data from other surveys. Here the improvement indicators will be the presence of the professional services and the gentrified services, whereas the decline indicator will be the presence of the services for poverty, the immigrant services and the training centres. These indicators help the area to improve or decline.

Change in Price of a Convenience Item across El Raval

Unlike other surveys, this survey is not based on the sampling zones. To find the price change, I have to identify the transect line first. This is very important, because if the transect line is placed wrongly, I would not be able to get a clear result. This means that the transect line should be on an environmental gradient. I chose to lay transect line between CAM (The Contemporary Art Museum) and the New Rambla, since each one is in the different representative area, meaning that both areas will have different social, economic and environmental quality. The transect line is shown in the map below.



← A map showing four sampling zones and transect line between CAM and New Rambla.

Once the transect line is chosen, the systematic sampling should be applied in order to avoid the bias. Here the systematic sampling is simply walking along the transect line, visiting every shop, including bars and restaurants, asking for a price of convenience item. I chose to ask for a can of Coca Cola, since it is most likely to be found in all the shops, bars and restaurants. Collecting price changes is important, since it reflects land value of the area where the price is collected.

Here, I predicted that as the shops get further away from CAM, the price of can of Coca Cola will decrease, because as the shops get further away from CAM, the renting price of the shop decreases.

Secondary Data

My secondary data will be taken from past few years' census data of El Raval. Although the census data will consist of data different to mine, I will use some of them which are relevant to my study. So I chose to use the census data for land use value and the origin of the population. The census data for land use value, which represents the price for renting the building for commercial services, will show the effects the urban regeneration scheme have on each sampling zone. The census data for the origin of the population will show me the total population of immigrants in the sampling zones,

which might help me explaining the difficulties in carrying out the regeneration scheme in the core of El Raval.

Problems associated with Data Collection

1. **Problems of random sampling**
   - The problem of random sampling is that the sampling zone can be missed out from the representative area, meaning that the sampling zone might cover huge areas of waste land. In order to solve this, I firstly identified the representative areas with my pilot study, so that the sampling zone is always inside the representative areas. However, this solution is completely reliable, because while I was doing my investigation, I have seen huge area of derelict land in zone 3, which was demolished in order to build new hotel.

   - Another problem of random sampling is that it was very difficult to keep all the sampling zone same size, because each zone has different layout of the buildings.

2. **Problems of selecting transect line**
   - The problem of transect line is that it can miss the representative area, since I had to follow the streets. So in order to solve this, careful selection of the transect line should be done.

   - Transect line is not a method of collecting as much detailed information as a belt transect. (Transect line only tells the researcher what is there) However, in this investigation, there was no need to use a belt transect, since the data I am collecting in a transect line, price changes of a convenience item, is sufficient enough for my investigation and also there was not enough time for me to carry out belt transect, which is more time consuming than the method of transect line.

3. **Problems of collection data**
   - Some areas in my sampling zones are not safe enough to go around by myself and to complete the worksheets. Also the local habitants might feel humiliated, since we were looking at their poor housing and making comments on how to improve the situations. Therefore, in order to be safe, we had to walk the area in group, a minimum of four people.

   - To complete all the worksheets by myself in all the sampling zones is very tiring and takes a lot of time. So we split the area into the numbers of groups we had and separated the amount of work each had to do. However, this method is not very good for the surveys like residential quality, environmental qualities and perception, because all of them are subjective survey. This means that if the first impression of the area was too bad, this impression lingers when I am completing the subjective surveys for other areas, affecting the data of other areas.

     This problem was caused particularly for zone 2 and zone 4, because the data for zone 2 was collected after collecting the data from zone 1, which is the most developed area in my sampling zones, and the data for zone 4 was collected after collecting data from zone 3, which is the worst area in my sampling zones. So the score for each survey for zone 2 might be slightly less than what it should have been and the score for each survey for zone 4 might be slightly higher than what it should have been.

- Since most of the shops in Barcelona close for lunch at 13:30 to 16:00, the land use mapping should be done before 13:30 or after 16:00. This was the major problem of my investigation and to solve this, I completed the land use maps in the morning and checked it after 16:00. It was necessary to check the land use map, since it was the major data needed to be collected for my investigation.

- Subjective surveys tend to show most negative results when we were hungry or bored or tired. Also the weather and seasons, like cold and wet day, will affect the reliability of my result, although when I did my investigation, it was sunny and warm.

Presenting Raw Data

For my raw data, I have scanned all the worksheets, including my initial land use maps and put them in the appendix.

Data presentation

From the data I collected, I could use a variety of presentation techniques to show and compare the differences between each zone. Firstly, in my residential quality data, high total score means a better residential area. Each feature has a different maximum score, since their contribution to the residential quality is different.

Indication Of Residential Qualities

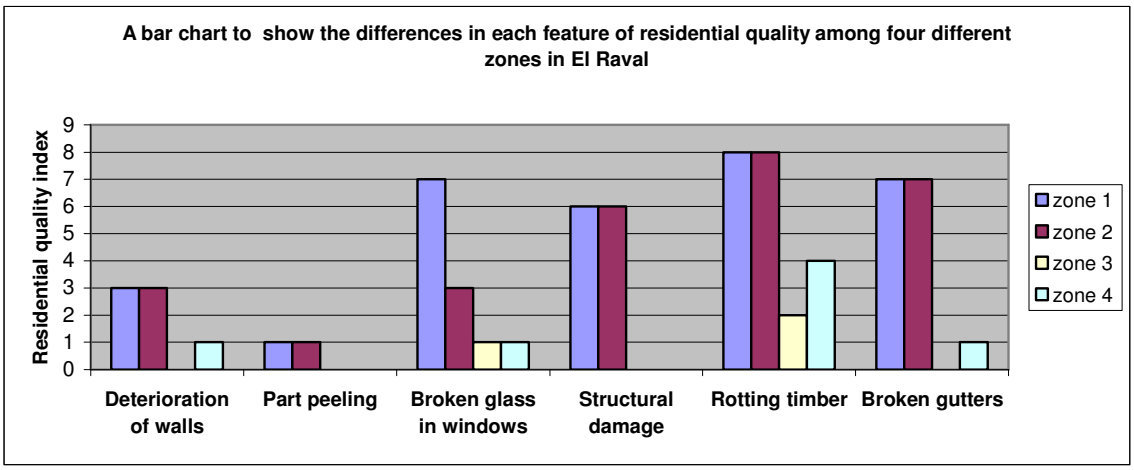
	Much	Some	Little	None
Deterioration of walls	0	1	3	5
Part peeling	0	1	2	3
Broken glass in windows	0	1	3	7
Structural damage e.g. settling cracks	0	3	6	11
Rotting timber	0	2	4	8
Broken gutters, etc.	0	1	3	7

Score	Physical condition of buildings
33 - 41	Good/excellent
23 -32	Satisfactory
14 - 22	Generally unsatisfactory. May be bad in specific parts
13-5	Action needed in very near future to improve structure
Below 5	Need to demolish or rebuild

Based on this maximum score, I collected the data of each zone.

Features	Site			
	zone 1	zone 2	zone 3	zone 4
Deterioration of walls	3	3	0	1
Part peeling	1	1	0	0
Broken glass in windows	7	3	1	1
Structural damage	6	6	0	0
Rotting timber	8	8	2	4
Broken gutters	7	7	0	1
Total	**32**	**28**	**3**	**7**

Using this data, I will now draw a bar chart for all the features and another bar chart for the total score of each zone to present my data, since the data presented in bar chart can be compared easily without any difficulty.

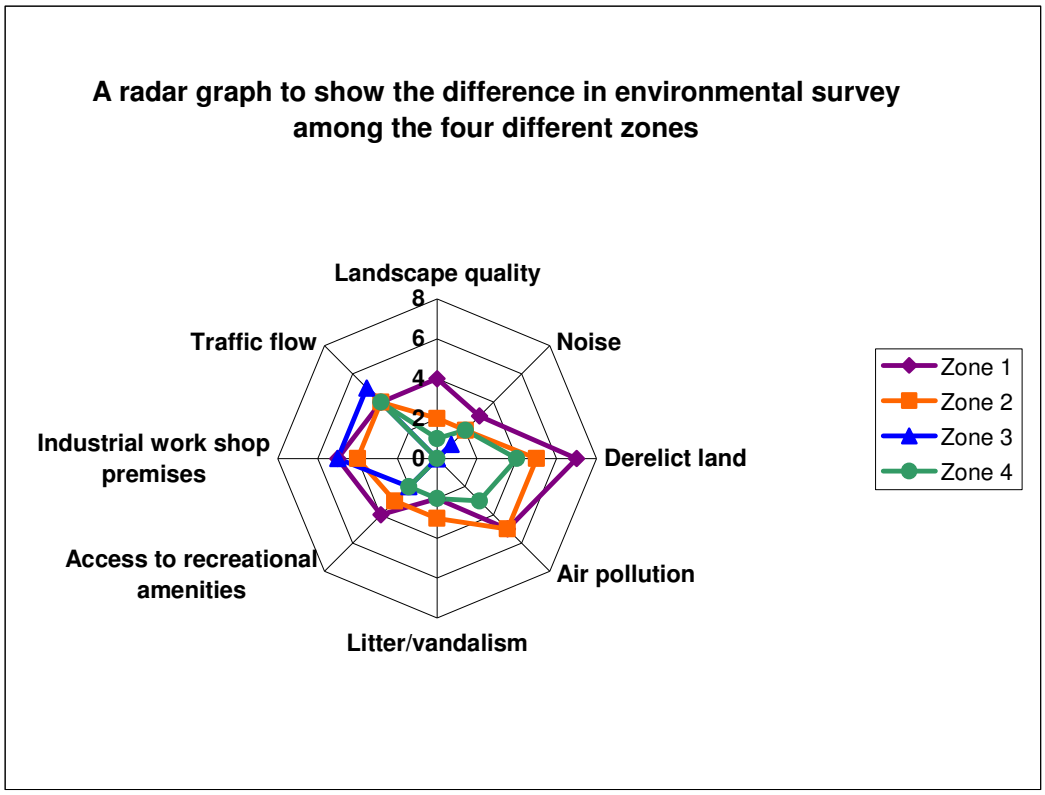


To present my environmental survey data, I used a radar graph technique, because in the radar graph, I could show different sets of data in one graph. In my environmental survey data, a high score means a better environmental quality and the maximum score for each feature is shown on the table below.

Features	Maximum Score
Landscape quality	8
Noise	5
Derelict land	10
Air pollution	10
Litter/vandalism	8
Access to recreational amenities	4
Industrial work shop premises	10
Traffic flow	6
Total	**61**

Based on this maximum score table, I collected my environmental survey data.

Features	Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Landscape quality	4	2	0	1
Noise	3	2	1	2
Derelict land	7	5	0	4
Air pollution	5	5	0	3
Litter/vandalism	2	3	0	2
Access to recreational amenities	4	3	2	2
Industrial work shop premises	5	4	5	0
Traffic flow	4	4	5	4
Total	**34**	**28**	**13**	**18**



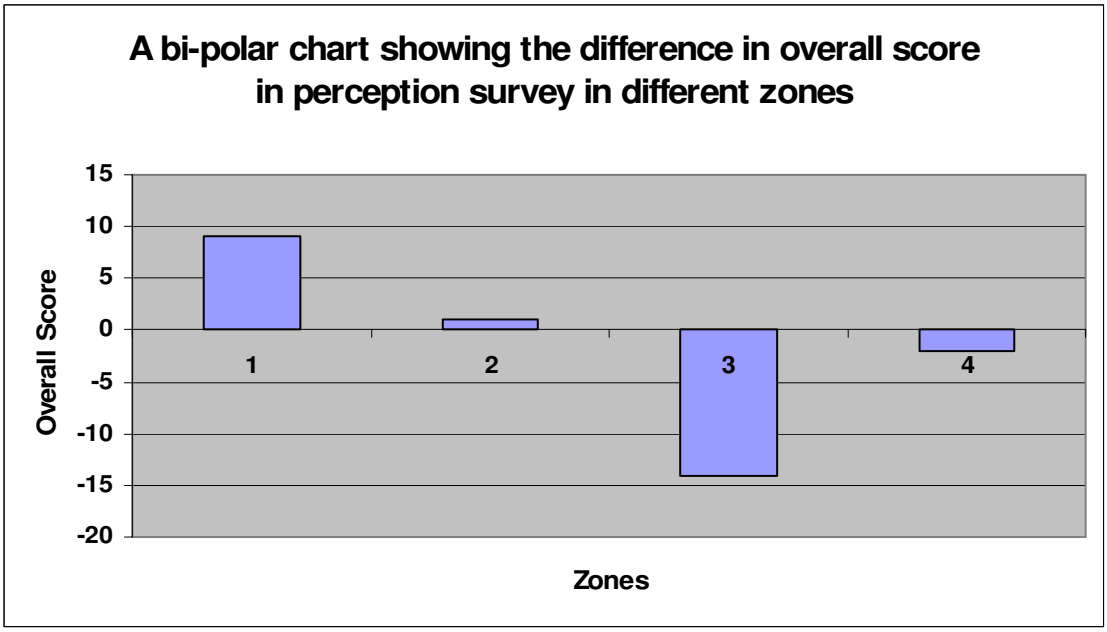
(The above graph shows positive attributes)

Now, I will draw a bi-polar chart to present my perception survey data. In a perception survey, a high overall score means better qualities and each score is based on a scale as shown below.

	Very strongly felt	Strongly felt	Felt	Not felt
SCORE	3	2	1	0

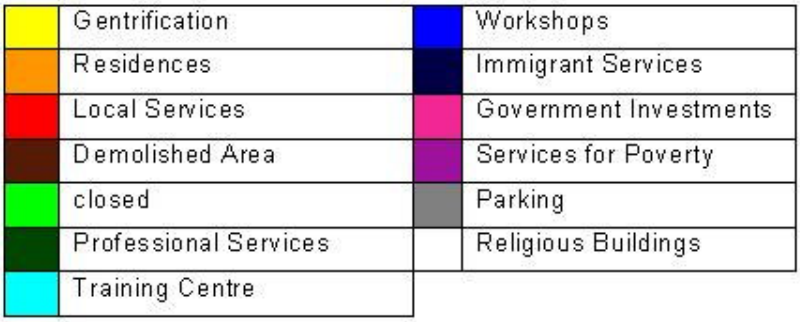
Following this score, I collected my data.

positive qualities	Zone			
	zone 1	zone 2	zone 3	zone 4
Rich	2	1	0	1
Safe	3	1	0	1
Friendly/relaxed	2	1	0	0
Improving	3	2	1	1
Community atmosphere	1	3	0	2
Attractive area	2	1	0	0
Total positive score	13	9	1	5
Negative qualities	**Zone**			
	zone 1	zone 2	zone 3	zone 4
Poor	1	1	3	1
Dangerous	0	2	3	2
Declining	0	0	1	0
Risk of crime	1	2	3	2
Unattractive area	0	1	3	2
Vandalised	2	2	2	0
Total negative score	4	8	15	7
Overall score	**9**	**1**	**-14**	**-2**



Land use maps (see the appendix) can be used to show how much percentage does the each category of services. So firstly, the summary of total number of buildings for each zone is needed. In the summary, I excluded car parking and demolished areas, since they are less relevant to the study than other type of services.

Key for the Land use maps



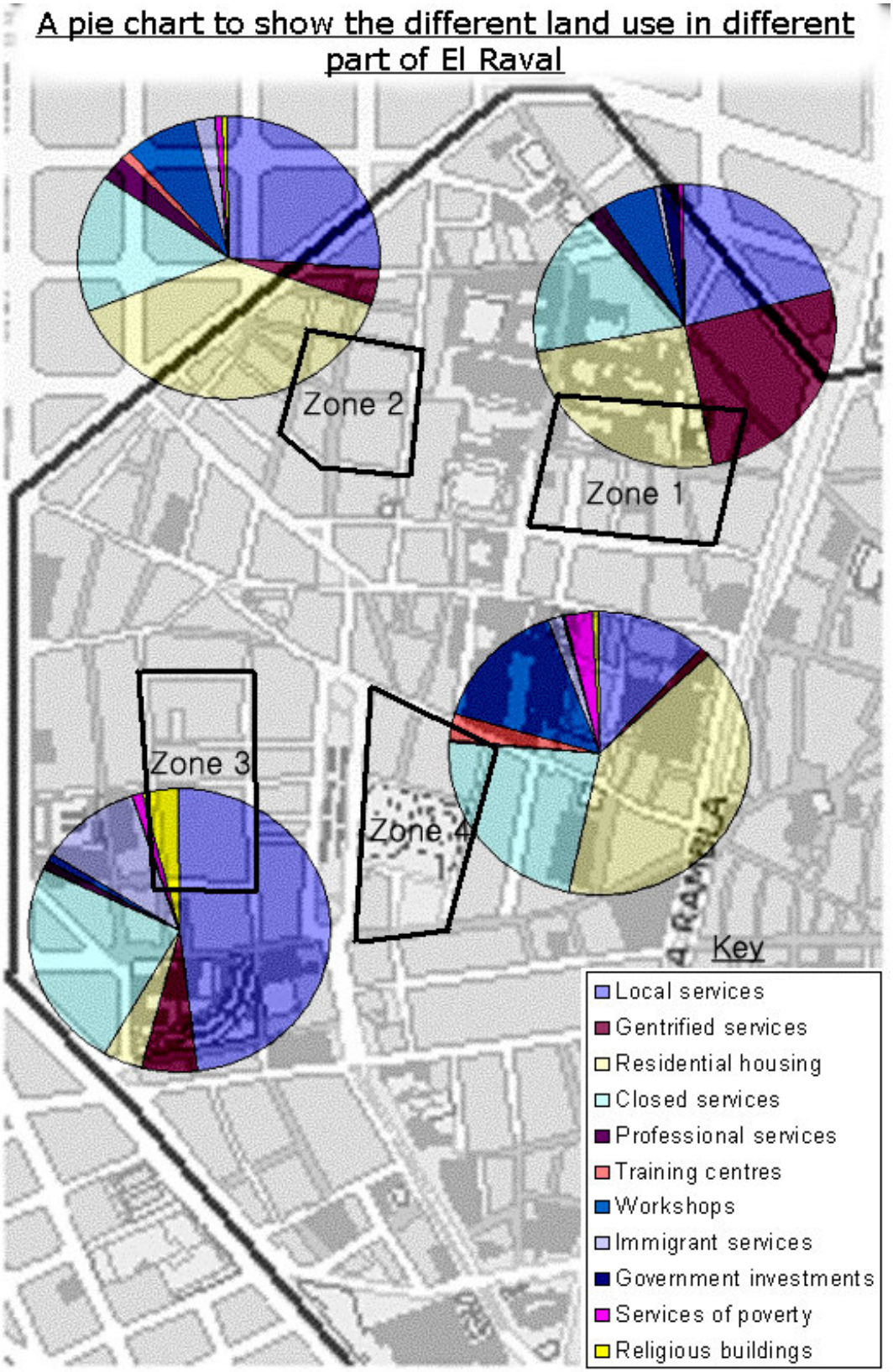
Numbers of buildings in each zone

Type of Services	Zone 1	Zone 2	Zone 3	Zone 4
Local services	45	86.5	34.5	36.5
Gentrified services	55	14.5	4.5	1.5
Residential housing	53	127	3	119
Closed services	35	51	18	70
Professional services	4	11	1	1
Training centres	0	2	0	10
Workshops	12	25	1	46
Immigrant services	1	6	8	5
Government investments	5	0	0	1
Services of poverty	1	2	1	9
Religious buildings	0	1	3	1
Total	211	326	74	300

Percentage of buildings in each zone

Type of Services	Zone 1 (%)	Zone 2 (%)	Zone 3 (%)	Zone 4 (%)
Local services	21	26.5	48	12
Gentrified services	26	4	6	1
Residential housing	25	38	4	40
Closed services	17	16	24	23
Professional services	2	3	1	0.5
Training centres	0	1	0	3
Workshops	6	8	1	15
Immigrant services	0.5	2	11	1.5
Government investments	2	0	0	0.5
Services of poverty	0.5	1	1	3
Religious buildings	0	0.5	4	0.5
Total	100	100	100	100

Using the percentage of buildings in each zone, I will draw a pie chart. The pie chart of each area, which shows the relative percentage, is plotted next to its zone. This diagram is advantageous over the normal pie chart, because 4 different relative land uses can be compared between each other easily.



Since I have done the land use mapping, it is essential to use it to analyse the differences. In order to compare different sets of land use mapping data, I will firstly categorise all the services into 3 groups and arrange my land use data as percentage. Here, I excluded the residential housing and closed services from total number of services.

Numbers of services in each zone

	Zone 1	Zone 2	Zone 3	Zone 4
Local services	45	86.5	34.5	36.5
Gentrified services	55	14.5	4.5	1.5
Other services	24	46	13	70
Total	124	147	52	108

Percentage of services in each zone

	Zone 1	Zone 2	Zone 3	Zone 4
Local services (%)	36.3	58.8	66.3	33.8
Gentrified services (%)	44.4	9.9	8.7	1.4
Other services (%)	19.4	31.3	25	64.8
Total (%)	100	100	100	100

Now, I could draw a triangular graph. Drawing a triangular graph is better than other techniques, because the land use data of each zone can be compared easily, particularly with the sets of data that deal with the changes over time. Here, I will introduce the secondary land use data taken from 2002(see the appendix to see the actual land use map). This data can be also put into the triangular graph, since the positions of the plots in the graph changes over time.

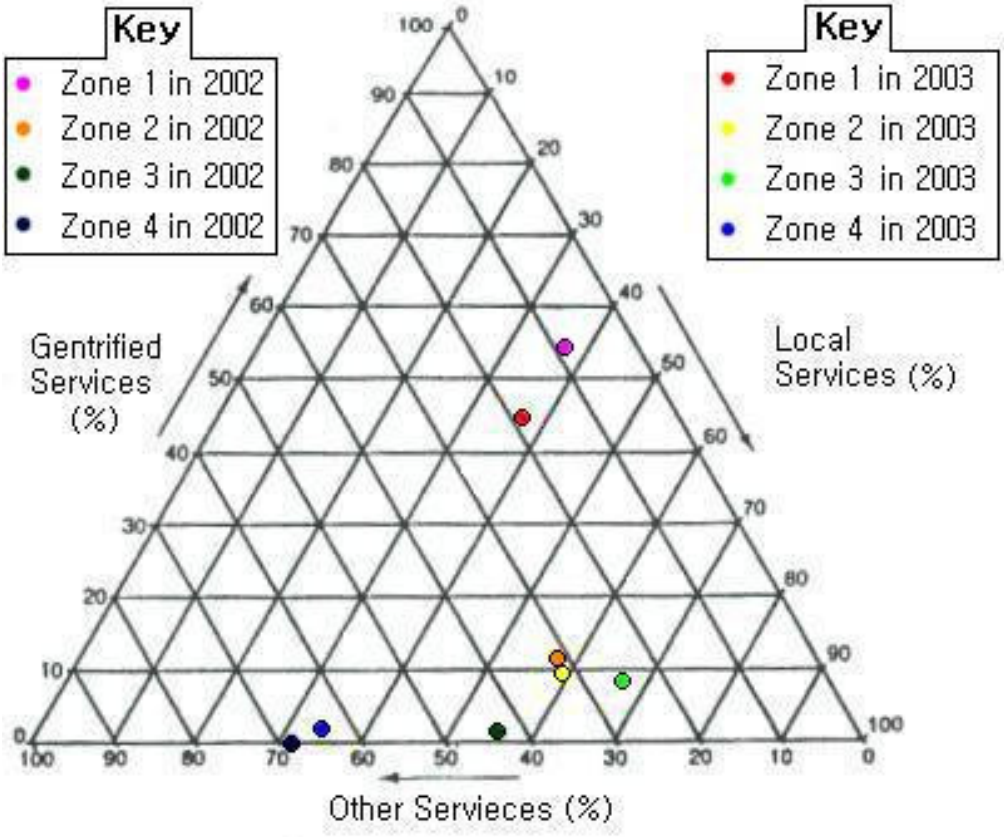
Numbers of services in each zone

	Zone 1	Zone 2	Zone 3	Zone 4
Local services	32	75	33	17
Gentrified services	47	15	1	0
Other services	8	42	25	38
Total	87	132	59	55

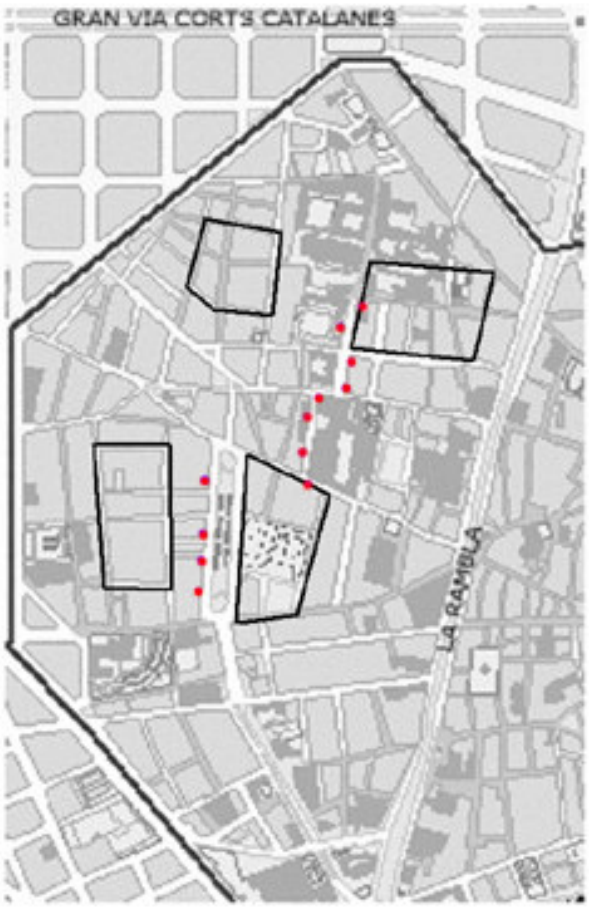
Percentage of services in each zone

	Zone 1	Zone 2	Zone 3	Zone 4
Local services (%)	36.8	56.8	55.9	31
Gentrified services (%)	54	11.4	1.7	0
Other services (%)	9.2	31.8	42.4	69
Total (%)	100	100	100	100

Putting this data into the same graph as the one where I plotted my land use data, it is easier to compare different sets of data rather than comparing two different triangular graphs.


Key
Zone 1 in 2002
Zone 2 in 2002
Zone 3 in 2002
Zone 4 in 2002
Key
Zone 1 in 2003
Zone 2 in 2003
Zone 3 in 2003
Zone 4 in 2003
Gentrified Services (%)
Local Services (%)
Other Servieces (%)
0
10
20
30
40
50
60
70
80
90
100

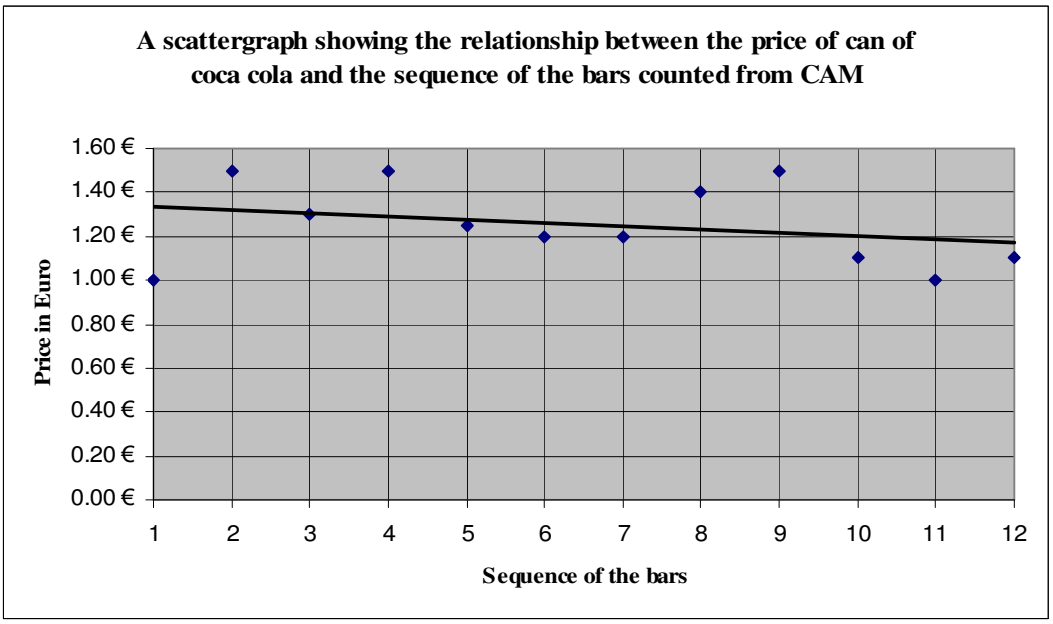
In order to get the price of can of coca cola, I walked along the transect line and asked the price of can of coca cola in 12 different bars. The locations of the bars are shown on the map below.



This data can be presented in a scatter graph. The price collected is shown in the table below.

sampling location	price in euros
1	1.00 €
2	1.50 €
3	1.30 €
4	1.50 €
5	1.25 €
6	1.20 €
7	1.20 €
8	1.40 €
9	1.50 €
10	1.10 €
11	1.00 €
12	1.10 €

A scatter graph is drawn to see correlation between two variables; price of can of coca cola in Euro and the sequence of the bars.



Using the data of price of can of coca cola, I can test the reliability and significance of my data with Mann Whitney *U* test of significance. Here, the term 'reliability' means how many researchers in every 100 would get the same result as mine. I predict that as the bar gets further away from CAM (Contemporary Art Museum), the price will get lower, because the land value will get lower as the bar gets further away from CAM.

Firstly, I have to divide my data into two groups. First 6 prices collected are in group A and other 6 prices collected are in group B.

Group A: 1.00€, 1.50€, 1.30€, 1.50€, 1.25€, 1.20€
Group B: 1.20€, 1.40€, 1.50€, 1.10€, 1.00€, 1.10€

Before, I carry out the Mann-Whitney *U* test, I will first calculate the each group's mean, median and mode to see whether there appears to be a difference between each group.

Group	Mean	Median	Mode
A	1.29 €	1.28 €	1.50 €
B	1.22 €	1.15 €	1.10 €

There seems to be difference between each group and this allows me to carry further statistical test to test the significance of the difference. In Mann-Whitney's *U* test, the group A is sample A and the group B is sample B.

A	B	B	B	A	B	A	A	B	A	A	B
1.00 €	1.00 €	1.10 €	1.10 €	1.20 €	1.20 €	1.25 €	1.30 €	1.40 €	1.50 €	1.50 €	1.50 €

U value for sample A = 0+3+4+4+5+5 = 21
U value for sample B = 1+1+1+2+4+6 = 15

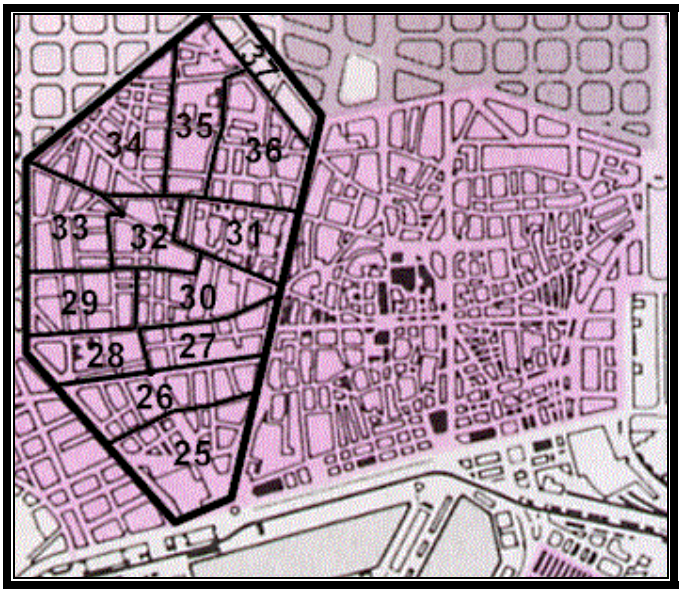
Smaller *U* value = 15

Now I have to look up the probability value in table below, which gives the percentage probability that the difference in the two sets of data has occurred by chance.

n¹ / u	1	2	3	4	5	6	7	8
0	11.1	2.2	0.6	0.2	0.1	0.0	0.0	0.0
1	22.2	4.4	1.2	0.4	0.2	0.1	0.0	0.0
2	33.3	8.9	2.4	0.8	0.3	0.1	0.1	0.0
3	44.4	13.3	4.2	1.4	0.5	0.2	01.	0.1
4	55.6	20.0	6.7	2.4	0.9	0.4	0.2	0.1
5		26.7	9.7	3.6	1.5	0.6	0.3	0.1
6		35.6	13.9	5.5	2.3	1.0	0.5	0.2
7		44.4	18.8	7.7	3.3	1.5	0.7	0.3
8		55.6	24.8	10.7	4.7	2.1	1.0	0.5
9			31.5	14.1	6.4	3.0	1.4	0.7
10			38.7	18.4	8.5	4.1	2.0	1.0
11			46.1	23.0	11.1	5.4	2.7	1.4
12			53.9	28.5	14.2	7.1	3.6	1.9
13				34.1	17.7	9.1	4.7	2.5
14				40.4	21.7	11.4	6.0	3.2
15				46.7	26.2	14.1	7.6	4.1
16				53.3	31.1	17.2	9.5	5.2
17					36.2	20.7	11.6	6.5
18					41.6	24.5	14.0	8.0
19					47.2	28.6	16.8	9.7

The value from the table is 14.1 and this means that the price collected further away from the CAM is cheaper than the price collected near to the CAM by 14.1% of chance. So my data has 85.9 % of reliability. This means that out of 100 researchers, about 86 researchers will achieve same result as mine.

The secondary data is the census data of divided zones in El Raval, shown in the map below, in 1996. I will use the census data of average household income and the population origin.

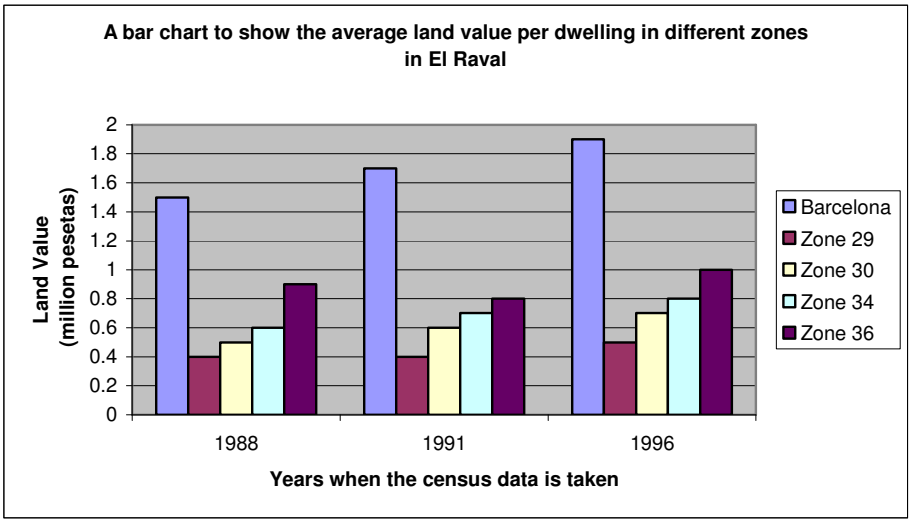


← Map showing the different zones in El Raval divided for the census

From the census data map, I am only interested in zone 29, 30, 34 and 36, since my representative areas are included in these zones.

Average Land Value per Dwelling (millions pesetas)			
Zone	**1988**	**1991**	**1996**
Barcelona	**1.5**	**1.7**	**1.9**
29	0.4	0.4	0.5
30	0.5	0.6	0.7
34	0.6	0.7	0.8
36	0.9	0.8	1

For the average land value per dwelling, I will draw a bar chart.

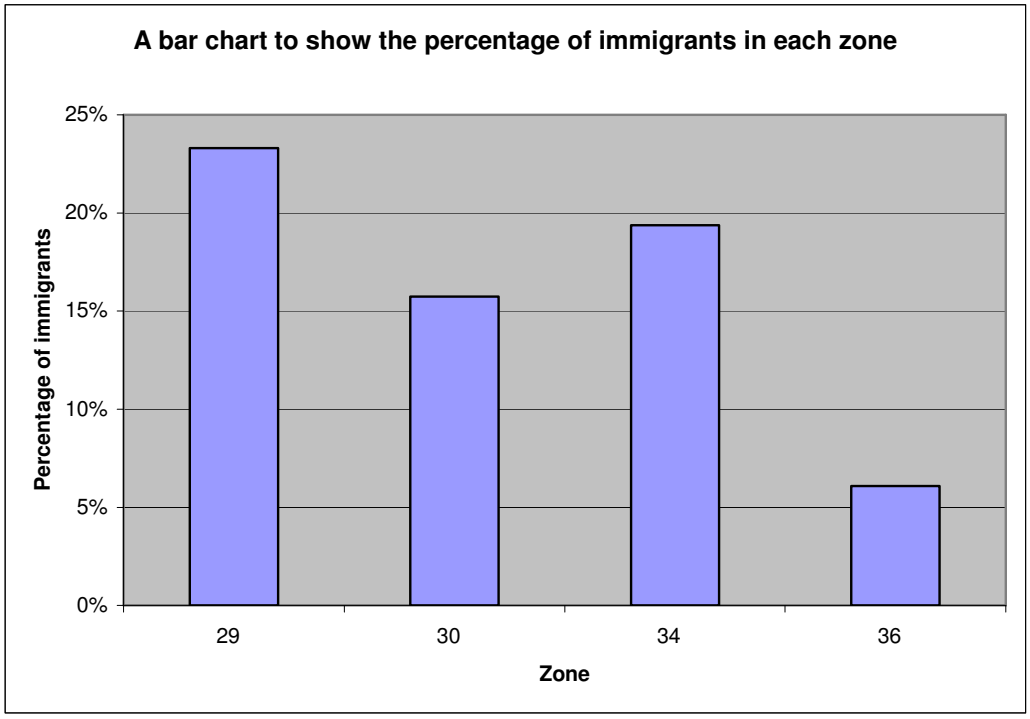


For the census data of the origin of the population, I will draw a bar chart to show the percentage of immigrants in the overall population.

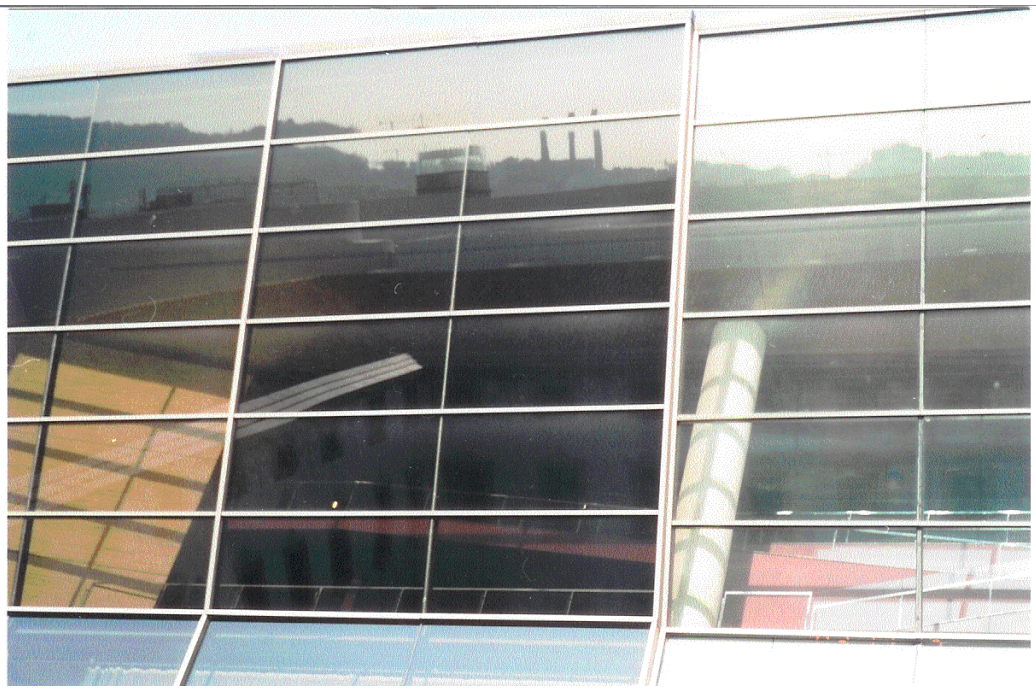
El Raval: Origin of the Population							
Population of the Census Zones 2000							
Zones	**TOTAL**	**Africa**	**America**		**Àsia**		
		Morroco	**Equador**	**Perú**	**Pakistan**	**Filipines**	**Índia**
29	3,712	299	78	5	406	76	1
30	1,754	64	13	7	95	70	27
34	9,554	323	217	60	360	867	23
36	2,598	22	4	17	23	88	4

Firstly, to draw a bar chart to show the percentage of immigrants in the zones, I have to calculate the total number of immigrants and then calculate the percentage of immigrants over the total number of population.

Zones	Total number of immigrants	Percentage of immigrants
29	865	23%
30	276	16%
34	1850	19%
36	158	6%



Photographs of El Raval



↑ the photograph above shows a reflection of tall chimneys on windows of CCCB (Contemporary Culture Centre of Barcelona) in El Raval. This presence of tall chimneys shows that the areas were used for industrial purpose in past and that still the industrial process is going on in some area.

↑ the mini-scaled model of four-star hotel that is going to be introduced in the derelict land in zone 3. Along with this new hotel, Catalan Films and TV film Library is planned to be transferred into this area.

↑ The photograph above shows the demolished area in zone 3. Behind the derelict land, the housing are poor and the buildings are built several storeys high, showing the heavy population density in the area.

↑ The photograph above shows a narrow street in zone 3. From the photograph, we could see wires hanging on the ceiling, showing the poorly managed state of houses.

↑ The photograph shows the Generalitat's plan to transfer the University of Barcelona's faculties of geography, of history and of philosophy next to the CCCB (Contemporary Culture Centre of Barcelona).

← The photograph shows poor housing in zone 3. The building needs reconstruction or demolition.

↑ The photograph of a narrow and dirty street in zone 4. The houses seem to be very old and they need reconstruction or demolition. Also there are no parking spaces for cars and it would be very difficult for some vehicles such as trucks to pass this alley-like street.

↑ Photograph of the Raval Rambla, which is the Generalitat's early investment in this area to improve the quality of life. This Raval Rambla creates an open space for both tourists and local people, reducing the risk of crime and traffic jams in this area.

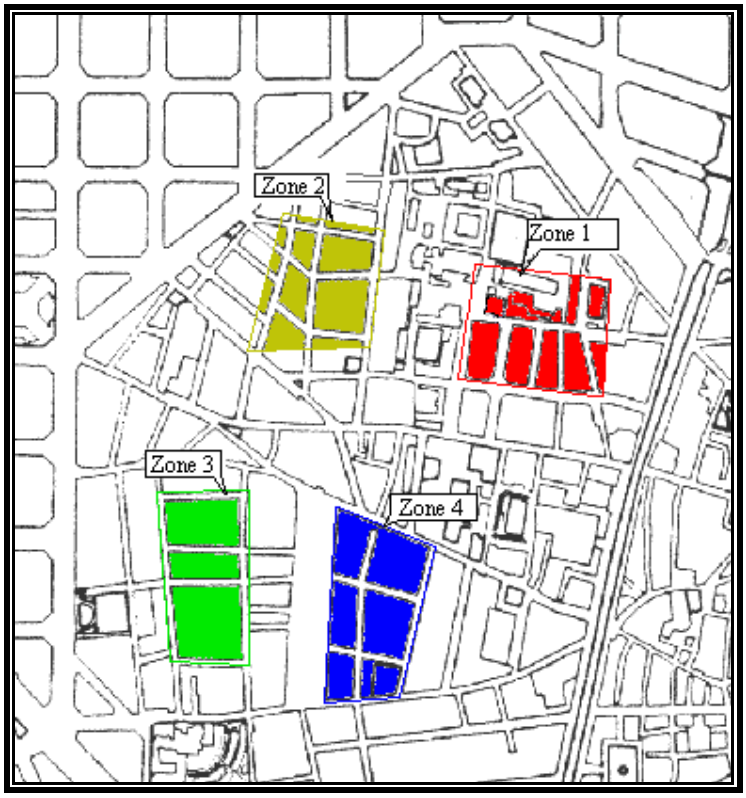
Data Analysis

In this section, I am going to use my presented data to analyse the social changes, the environmental changes, economic changes and the changes in land use. First of all, I am going to summarise my data into a clear table, so that it is easy to compare.

Data Description	Specific Features		Zone			
			1	**2**	**3**	**4**
Historic land use categories (%)	Local services		36.8	57.7	55.9	31.5
	Gentrified services		54	11.5	1.7	0
	Immigrant services		3.45	15.2	28.8	30.9
	Professional services		4.6	9.1	0	1.8
	Services of poverty		0	3	5.1	3.6
	Training centre		0	0	0	9.1
	Workshops		1.15	4.5	8.5	23.6
Present land use categories (%)	Local services		21	26.5	48	11.5
	Gentrified services		26	4	6	1
	Residential housing		25	38	4	38.5
	Closed services		17	16	24	22.5
	Professional services		2	3	1	0.5
	Training centres		0	1	0	3
	Workshops		6	8	1	15
	Immigrant services		0.5	2	11	1.5
	Government investments		2	0	0	0.5
	Services of poverty		0.5	1	1	3
	Religious buildings		0	0.5	4	0.5
	Parking		0	0	0	2.5
Residential quality	deterioration of walls		3	3	0	1
	Part peeling		1	1	0	0
	Broken glass		7	3	1	1
	Structural damage		6	6	0	0
	Rotting timber		8	8	2	4
	Broken gutters		7	7	0	1
	Overall score		**32**	**28**	**3**	**7**
Environmental quality	Landscape quality		4	2	0	1
	Noise		3	2	1	2
	Derelict land		7	5	0	4
	Air pollution		5	5	0	3
	Vandalism		2	3	0	2
	Access to Recreational Amenities		4	3	2	2
	Industrial work shop		5	4	5	0
	Traffic flow		4	4	5	4
	Overall score		**34**	**28**	**13**	**18**
Perception	Positive qualities		13	9	1	5
	Negative qualities		4	8	15	7
	Overall score		**9**	**1**	**-14**	**-2**
Secondary data	**Land value (million pesetas)**	1988	0.9	0.6	0.5	0.4
		1991	0.8	0.7	0.6	0.4
		1996	1	0.8	0.7	0.5
	Immigrant (%)		6	19	16	23

From this summary, I am going to look at each zone in detail, summarising the differences between each data.

Summary of each zone



Zone 1

Zone 1 is a sampling area where the percentage of government investments, gentrification and all the survey scores (residential quality, environmental quality and perception survey) are highest among all the sampling zones. The percentage of government investments in the area is 2 % and the percentage of gentrification is 26 %. Excluding the residential housings and closed services, the percentage of gentrification in this area is 44.4 % which is significantly higher than percentage of gentrification from any sampling zones and it is even higher than the total percentage of gentrification in all other three sampling areas. The score for residential quality is 32, the score for environmental quality is 34 and the score for perception survey is 9, all of them higher than other zones. Also zone 1 has the highest land value; 1 million pesetas per dwelling in 1996 and in land use map of 2002, zone 1 had the highest percentage of gentrification, 54 %.

On the other hand, zone 1 has the lowest percentage of training centre, 0 %, the lowest percentage of immigrant services, 0.5 %, the lowest percentage of religious buildings, 0 %, and the lowest percentage of services of poverty, 0.5 %. Also it has the lowest percentage of immigrants, 6 %, in the area. From the historic land use of 2002, zone 1 had the lowest percentage of immigrant services, 3.45 %, the lowest percentage of training centre, 0 %, the lowest percentage of services of poverty, 0 %, and the lowest percentage of workshops, 1.15 %.

Zone 2

Zone 2 is a sampling area where it shows the highest percentage of professional services, 3 %. In past 2002, zone 2 had the highest percentage of local services, 57.7 % and the highest percentage of professional services, 9.1 %.

On the other hand, zone 2 has the lowest percentage of closed services, 16 %, and the lowest percentage of government investments, 0 %. In 2002, zone 2 had the lowest percentage of training centre, 0 %.

Zone 3

Zone 3 is a sampling area where the percentage of local, immigrant and closed services are the highest among the sampling zones. The percentage of local services is 48 %, the percentage of immigrant services is 11 % and the percentage of closed services is 24 %. Also it has the highest percentage of religious buildings, 4 %. In 2002, zone 3 had the highest percentage of services of poverty, 5.1 %.

On the other hand, zone 3 has the lowest percentage of residential housings, 4 %, the lowest percentage of training centre, 0 %, the lowest percentage of workshops, 1 %, and the lowest percentage of government investments, 0 %. In 2002, zone 3 had the lowest percentage of professional services, 0 %, and the lowest percentage of training centre, 0 %. Also all the score for the residential quality, 3, environmental quality, 13, and perception survey, -14, show the lowest score among other sampling zones.

Zone 4

Zone 4 is a sampling area where the percentage of residential housings, training centre, workshops and services of poverty are the highest among the sampling zones. The percentage of residential housing is 38.5 %, the percentage of training centre is 3 %, the percentage of workshops is 15 % and the percentage of services of poverty is 3 %. Also it is only zone where the parking takes 2.5 % of land use. In 2002, zone 4 has the highest percentage of immigrant services, 30.9 %, the highest percentage of training centre, 9.1 % and the highest percentage of workshops, 23.6 %.

On the other hand, zone 4 has the lowest percentage of local services, gentrified services and professional services. The percentage of local services is 11.5 %, the percentage of gentrification is 1 % and the percentage of professional services is 0.5 %. From the historic land use in 2002, zone 4 has the lowest percentage of local services, 31.5 % and the lowest percentage of gentrified services, 0 %.

Explanation

In this section, the explanation is tentative, because the study has been completed in a short period of time and I do not have enough historic data to give a general explanation of the changes within El Raval. However, using my data, I can identify the reasons for the changes in each area.

History of Each Sampling Zones

To help me to explain the differences in each sampling zones, I will firstly use the history of each sampling zones.

Zone 1	**Zone 2**
The area was favoured location for convents and monasteries.	The area used to be the densest part of El Raval.
Zone 3	**Zone 4**
The area has historically been a 'red light district'.	The area had the largest number of factories in El Raval.

From the history of each sampling zone, the reason why the zone 1 shows better qualities than other zones is because monasteries and convents are easier to be restored as part of the gentrification programme. Since the old cultural buildings are used in the gentrification scheme, the area attracts tourists which help the shops in the area to become more gentrified than the shops in other sampling areas. This explains the rising land value around this area and so some immigrants can not afford the rent of the house, supported with the fact that the land value in zone 1 is the highest compare to other zones. The effect of having the least percentage of immigrants helps the area to become less intimidating for both local people and tourists, because many immigrants in El Raval are from Less Economically Developed Countries (LEDCs) and some people with prejudice against these immigrants will maybe relate them with Al-Qiada, a recent threat to the Spanish Government due to their terrorist attack in Madrid, making tourists to be scared away from them.

Using the history of zone 3 and 4, the immigrants are more likely to be attracted to zone 3 and 4, because of their low land value compare to other part of El Raval. These immigrants seem to have different religious belief and this is supported with the fact that in zone 3, where the zone showed the highest percentage of immigrant services and the highest percentage of religious buildings, there was a mosque, which was not found in any other part of El Raval.

Also based on the history of zone 4, the reason why zone 4 has the highest percentage of workshops is because the area used to be industrialised and this remains in the area even today. There is a relationship between the percentage of workshops and the residential housing and this explains the highest percentage of residential housing in zone 4. Also the percentage of immigrants is the highest in zone 4, because the workshops need a lot of labour force and many workshops would employ cheap immigrants. The fact that zone 4 is close to zone 2 suggests that while the factories were remaining in zone 4 during the Industrial Revolution, most of the labour forces were living in zone 2, where it was the densest part of El Raval. This is also supported by the map of the location of the cotton factory in El Raval. (See appendix, 'cotton factories')

Urban renewal and the Barcelona's approach

Now using the Barcelona's urban renewal scheme, I am going to explain the reasons in more detail. The Barcelona's overall urban renewal consists of 'changing the area to change the people'. In this urban regeneration scheme, the following factors were applied to the El Raval urban renewal scheme.

- The history of El Raval was incorporated in the urban renewal scheme. The northern part of El Raval, where there are numerous cultural buildings, like convents and cathedrals, saw large investment, as is shown in the land use data of government investments (2 % in northern part of El Raval and 0.5 % in southern part of El Raval). High government investment in northern part of El Raval is used to increase its cultural value and to increase the numbers of tourists coming. For example, buildings like old monasteries and convents were conserved for public uses such as school, cultural centres and libraries. This is applied to zone 1, where the building of CCCB (the Contemporary Culture Centre of Barcelona) was originally a monastery and a library for students in zone 1 was a cathedral.

  On the other hand, the southern part of El Raval, where some old factories still remain, were left for a further 10 years as the Council felt that the core was 'too far gone' to be easily turned around. However, it is seemed that the southern part of El Raval is beginning to see investments, reflected in the improving quality of housing.

- Careful planning of public building locations to encourage regeneration. For example, a newly planned hotel in zone 3 and CAM (the Contemporary Art Museum) and CCCB (the Contemporary Culture Centre of Barcelona) in zone 1 are placed in specific places to encourage gentrification in the area. So far, the plan has succeeded in achieving its objective except in zone 3, which is still awaiting development. However, there is some indication (gentrification) that despite the uncertainty of the scheme, speculators are affecting land use in a positive way.

- The introduction of mixed land uses into an area, including service industries, offices and private and public housings. This scheme provokes the mixing of different socio-economic groups and the avoidance of ghettos and stigmatisation. This scheme is mainly applied to zone 1 and 2, where the area has a variety of services, and to the Raval Rambla, where a variety of services are moving in to satisfy the need of local people.

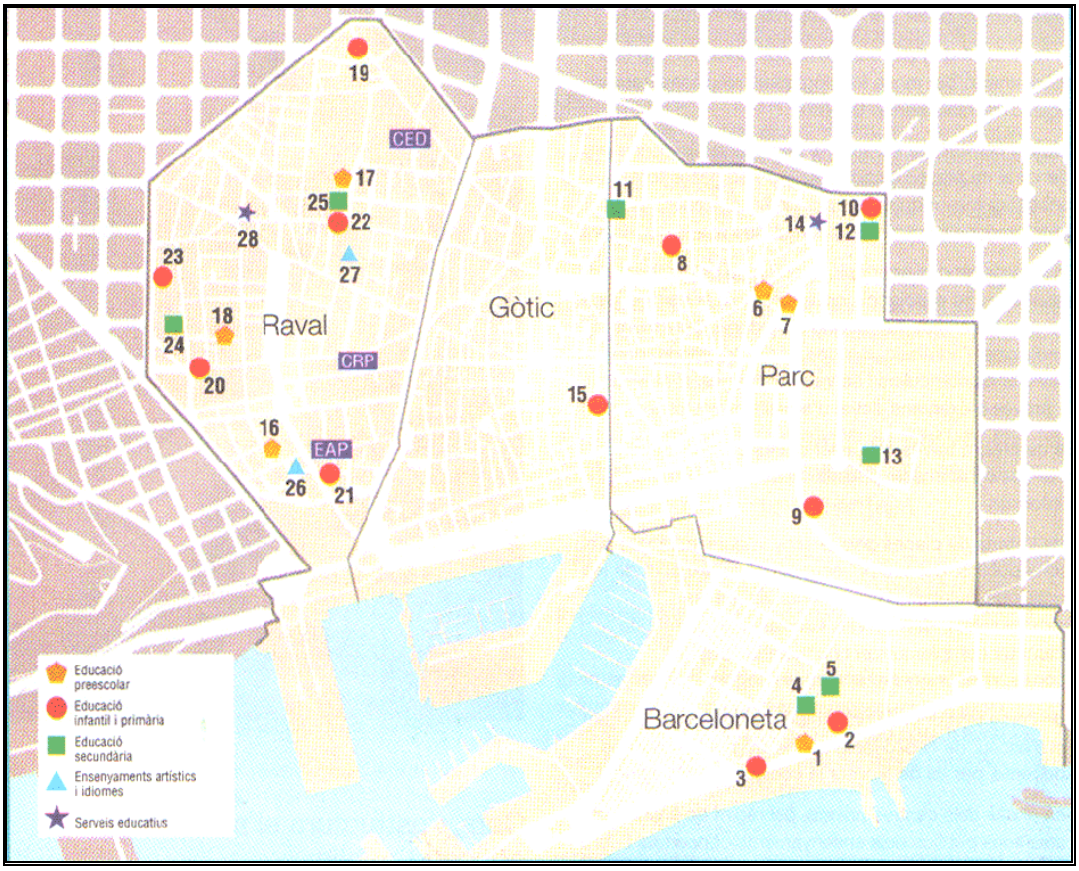
- The creation of new communal open spaces in some areas to encourage social mixing. So far, this has applied to zone 1, 3 and 4. For example, the CAM and CCCB in zone 1, the demolished area in zone 3 for a public park, and the Raval Rambla between zones 3 and 4. All of these open spaces have improved the safety of both tourists and local people in the area and they have succeeded in achieving their goal; new open space to encourage social mixing.

- Buildings in very poor conditions have been bought by the Generalitat and they have been renovated to a high standard in both interior and exterior using public funds. This renovation is happening all over El Raval, which can be seen from the census data of building renovation in 2002. (See the appendix for the census data for building renovation in 2002.)

- The government has invested huge amounts of money in transport infrastructure to improve accessibility, which increases the opportunity for economic and social activity. This plan was applied to all over El Raval and the

most important result is the creation of a huge space, 300 metres long and 55 metres wide, the Raval Rambla between zone 3 and 4. The creation of the Raval Rambla has succeeded in reducing traffic jams and has increased the opportunity for economic and social activity, leading to the development and gentrification around the Raval Rambla. Also some streets in zone 2 are pedestrianised and new traffic lights and computerised access system are introduced to control the traffic flow.

- The Generalitat has invested greatly in improving the education and leisure in El Raval. Increase in educational and leisure facilities results in increasing the opportunity for jobs and also reducing the social problem of illiteracy and high crime rate. This scheme has been applied all over El Raval and the numbers of primary and secondary educational facilities in El Raval are greater than any other part of Ciutat Vella. Also the numbers of educational facilities are concentrated in zone 1 and zone 4. This can be seen in the following diagram, taken from 'Barcelona és una bona escola', provided by the Generalitat de Catalunya.



Keys

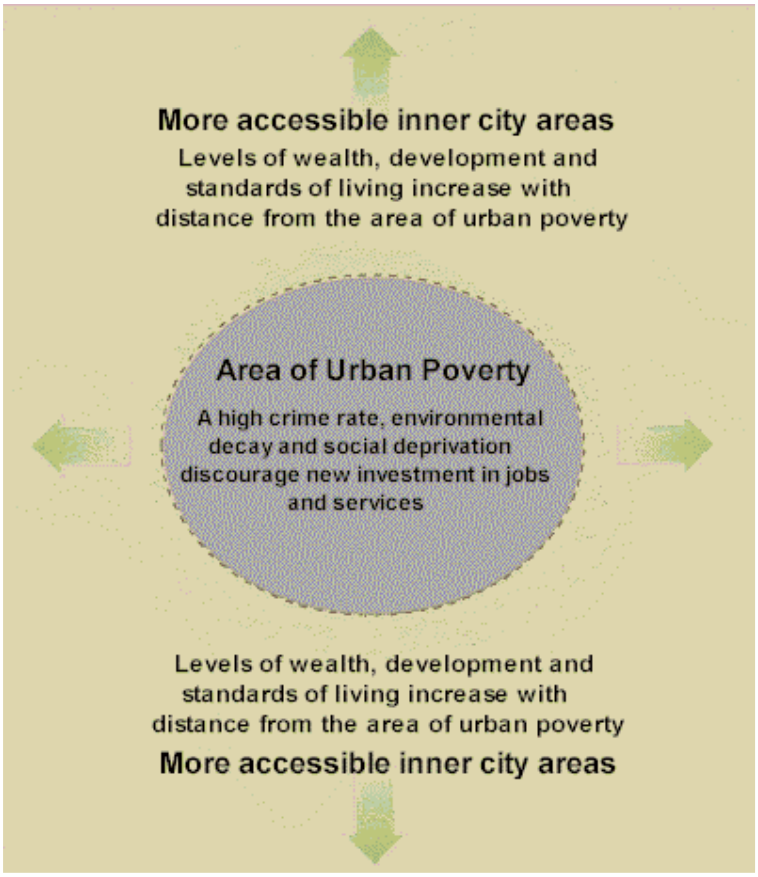
- Preschool education
- Primary education
- Secondary education
- Artistic and idiomatic institutes
- Educational services

the residential quality in zone 2 is better than zone 4, comparing the data for zone 2 and 4. Zone 2 is better than zone 4, because it has higher percentage of professional services and higher percentage of gentrified services, which are both the improvement indicator. Also the higher investment in zone 2 perhaps explains the lower percentage of immigrants even though the percentage of residences in the area is similar to zone 4. This may be because that the housing is more expensive in zone 2 due to higher land value compared to zone 4, which suggests that the higher percentage of investments is

put into the uses to improve the quality of the buildings, which eventually causes land to have higher value.

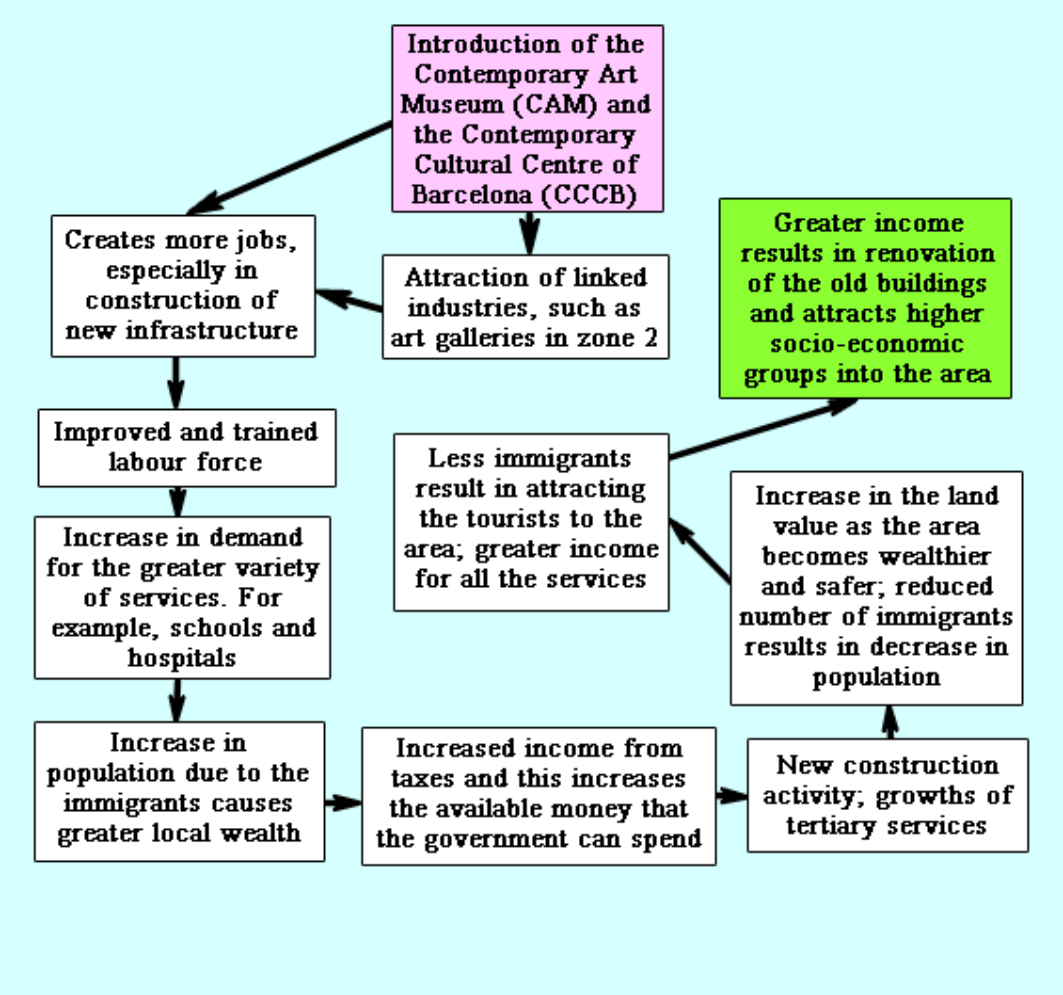
Urban Models

The Generalitat started in the periphery of El Raval, Zone 1, not in the core of El Raval, zone 3. This is because they have followed the Reverse of the Core-Periphery Model.



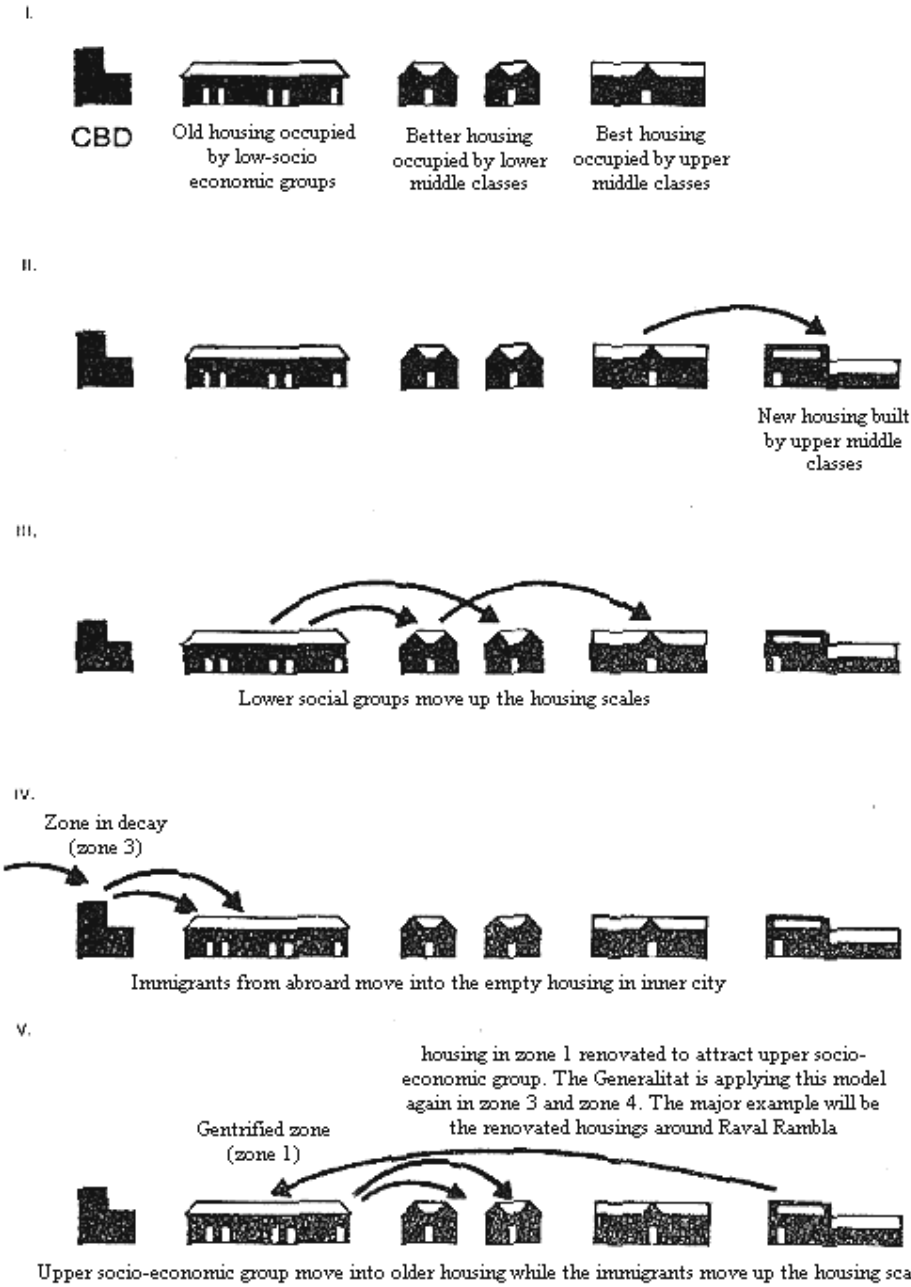
← A simple diagram to show the Reversal Core-Periphery Model.

This model consists of introducing influential buildings in the periphery to create multiplier effect into the other zones. In the Barcelona's urban regeneration scheme, the influential buildings are the CAM and CCCB. By introducing these buildings, the quality of life in northern part, zone 1, has been hugely benefited; causing more gentrification in these parts compared to the others, and this attracts the tourist into this area where it used to be a very dangerous place to go. Also this introduction of influential buildings have eventually resulted in the creation of direct and indirect jobs in the area due to the multiplier effect. This multiplier effect on El Raval can be seen in the simple diagram following, where the pink box is the beginning of the urban renewal, and the green box is the final result of the multiplier effect.



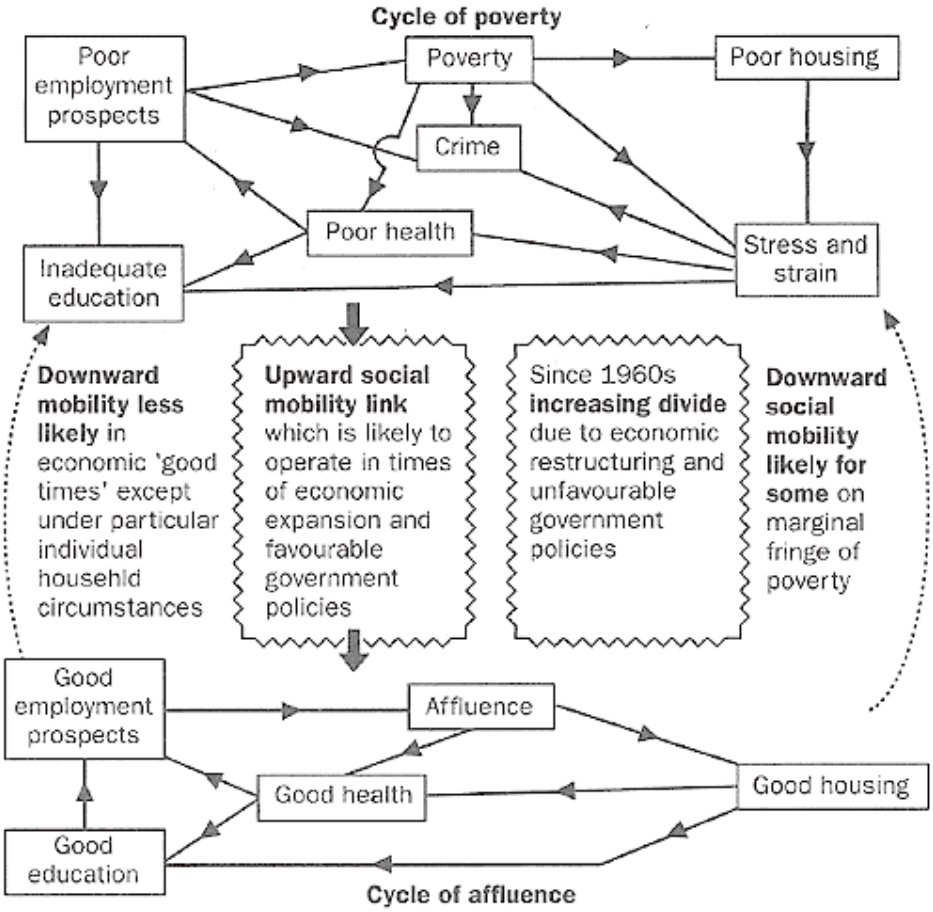
This multiplier effect provided the jobs not only for the residents in zone 1 but also for the residents in zone 2. This, perhaps, explains the high percentage of housing density in zone 2, although a greater amount of money has been invested in zone 2 than zone 4. However, the spread effects to zone 3 are not yet apparent even though it is close to zone 1 and this is perhaps because zone 3 has the least score for all the surveys, meaning that it is not a pleasant place to live. In future, after the installation of the new hotel in zone 3, the multiplier effect is more likely to cause spread effects to zone 3.

The final result of multiplier effect will be the urban filtering. This model consists of adapting the housing in the inner city suitable for the wealthier socio-economic group and this results in the gentrification in the area.



However, from my data and the historic data of zone 1, it seems that the percentage of gentrified services in the area is decreasing, which may be caused by the sampling error. So there is not clear evidence of decline in zone 1, which will be the number of closed premises. The area benefits by being close to the Central Business District (CBD), where the variety of services has already installed and high socio-economic groups are spending their money in the CBD, as well as in the periphery of El Raval.

Another model that can fit into El Raval is the Cycles of Poverty and Affluence. In El Raval, the area with greater poverty will be the southern part of El Raval, zone 3 and zone 4, and the area with affluence will be the northern part of El Raval, zone 1 and zone 2.

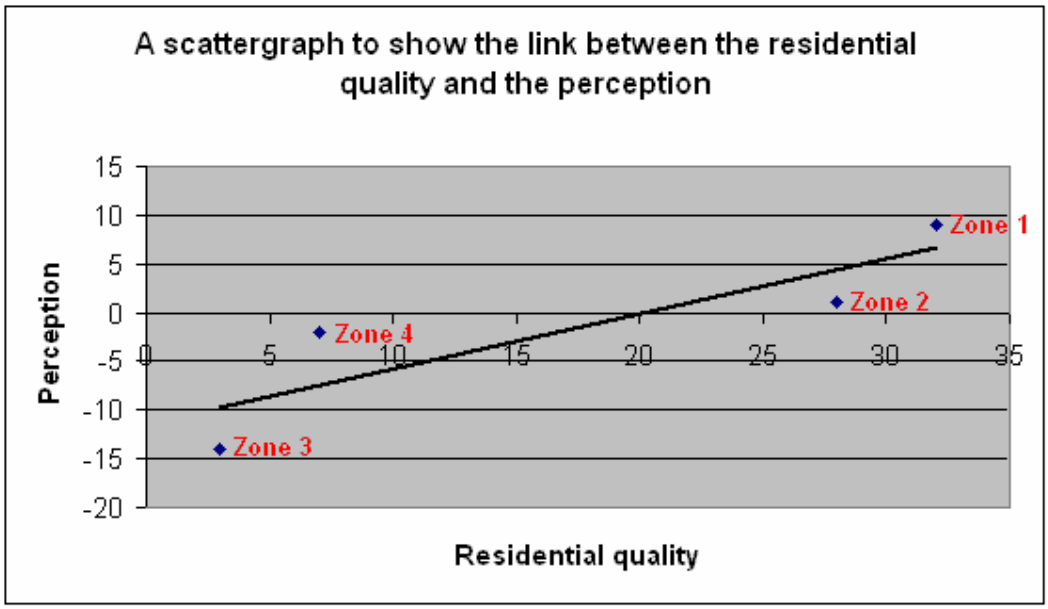


This cycle of poverty and affluence is important in understanding the inner city problems. From the poverty itself, the risk of crime, the poor housing and the health problem have increased, which were reflected precisely in the surveys of zone 3 and zone 4 that I have carried out, especially in the perception survey. However, from the introduction of the Raval Rambla, zone 3 and zone 4 are becoming the areas with more affluence than before due to the successful government policies.

In contrast, in zone 1 and zone 2, the people earn better income and this results in improvement of their lifestyle and their housing. However, the last year's world economy was worse than the other year's world economy due to the higher unemployment over the world, the higher price of crude oil and the higher price of raw materials. Also the world's economy was affected by the war in Iraq. This bad economic situation could explain the small decline in the gentrification of zone 1.

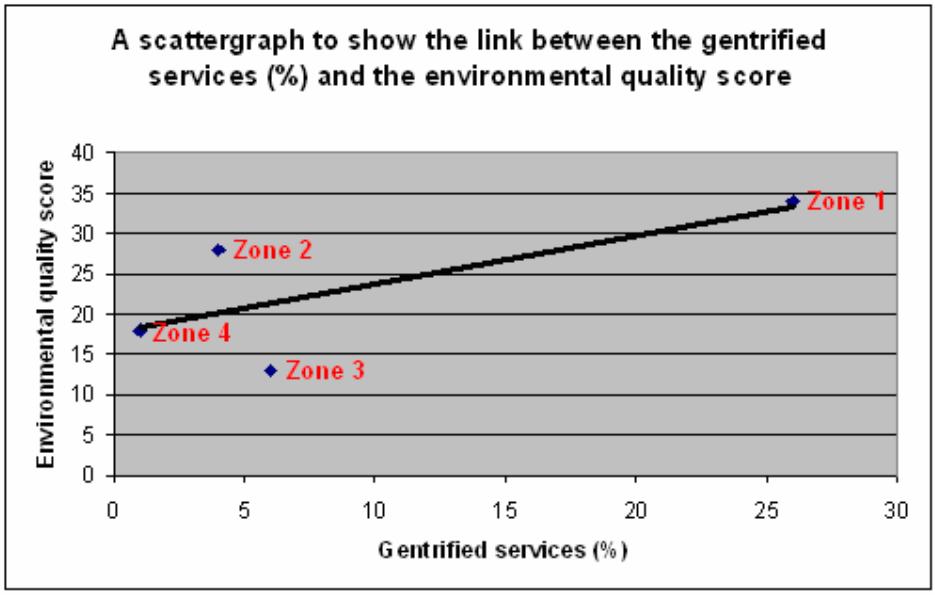
Identifying link between different sets of data

The links between different sets of data can be identified by drawing a scatter graph. For example, there is a relationship between residential quality and perception score.



From the graph, there is a positive correlation between perception and the residential quality score. This means that as either the residential quality or the perception score increases, the other quality increases as well. Since the residential quality represents social changes and the perception represents economic changes, this means that as the people in the area becomes wealthier, the impact on the society is greater. Also bigger the social changes, wealthier the area will become. This is because the area will be losing immigrants as the perception score increases since immigrants can not afford expensive housing, and so by cleansing the society, the area becomes wealthier, because higher socio-economic group is attracted to the area.

Another example is the link between gentrified services (%) and the environmental quality score.



From the graph, there is a positive correlation between environmental quality and the percentage of gentrification. Since environmental quality represents environmental change, the graph shows higher the environmental quality score, higher the percentage of gentrification in the area. This is because a better environment attracts people and so the services follow. Since people demand for higher variety of services, gentrification occurs in the area with better environment.

Conclusion

El Raval is changing due to the Barcelona's urban regeneration scheme that has succeeded in creating social, environmental and economic changes. These changes, overall, have improved the reputation of El Raval. The changes have attracted higher socio-economic groups into the inner city and so have increased the land values, leading to the city in general to become wealthier. By attracting higher socio-economic groups, the marginal inhabitants can be driven away, reducing the atmosphere of intimidation.

Each zone is changing in a unique way, but all changes are in line with the renewal scheme's main aim.

- Zone 1 is changing rapidly due to the presence of influential buildings such as CAM and CCCB and this area was the first to be gentrified since it is closer to Central Business District (CBD) and also it is on the periphery of El Raval, meaning that the reverse Core-Periphery model can be applied. So in zone 1, more gentrified services are found than in any other zones and the numbers of government investments and the educational facilities are increasing. Since most of urban regeneration schemes in zone 1 have been completed, the area will be improving steadily in future

- Zone 3 is improving very slowly, since the area is in the centre of El Raval, which caused this area to be left out from the scheme for first 10 years. However, the area seems to be improving recently as the poorer housing is being demolished to create new communal space and a new hotel. The introduction of these new land uses has boosted the economy in zone 3. So in zone 3, the percentage of local services has decreased and a gentrified service has recently installed, indicating that the area will be more gentrified once the hotel is constructed. The presence of gentrified services even before the hotel has been constructed suggests that zone 3 will improve more in future

- Zone 2 has improved more than zone 4, because it benefits from proximity to the CAM (Contemporary Art Museum). This is shown in the land use map, where the gentrified services are concentrated in the street that leads to CAM. This suggests that the influence of CAM may eventually reach to the core of zone 2 and so the area will become more gentrified in future.

- Zone 4 has improved less rapidly than zone 2, where an industrial atmosphere is still lingering. This is supported by the land use map, where the percentage of workshops and training centres are the highest among all the zones. So zone 4 is least likely to improve in future, because of the negative effects of workshops and training centres. Zone 4 is the furthest away from the influence of gentrification in zone 1 and the area may only start to improve once the hotel in zone 3 is constructed.

Although the urban renewal scheme has successfully altered the changes within El Raval, some people in the area are against these changes. For example, the owner of restaurant 'Casa Leopold' in zone 3, where a simple dish of a meat cost over 60 €, complains that due to the urban renewal, the restaurant has lost their wealthy customers, who are famous in public who were attracted by the concealed area. This has lead to a decrease in profits. On the other hand, some people like local workers and the Generalitat are for the changes, since they can achieve an economic benefit from the area that is being managed.

Evaluation

Some limitations of my study included the fact that the land use of each zone was based on the buildings on the ground floor and there is a possibility that if I had included the uses of the upper floors, different results may have been obtained. For example, in zone 1, some first floor properties have been converted to professional services, while in zone 3, the corners has often been for illegal 'gambling' dens – a difficult service to categorise.

Also the historic data of residential quality, environmental quality and perception survey does not exist and the historic land use map is based on different keys, so the data can not be compared fairly to identify the differences.

Another limitation was that the data was collected at certain times of the day, when some shops were closed.

To overcome these limitations and to improve my investigations, I could use a greater range of census data and also I could collect the same data from same area at different time, to see whether the time affects the land use of each area. Also I could spend more time on the land use mapping to get rid of the anomalous results and this will give me the better data, since the land use map was the main aim of my data collection.

Bibliography

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Appendix

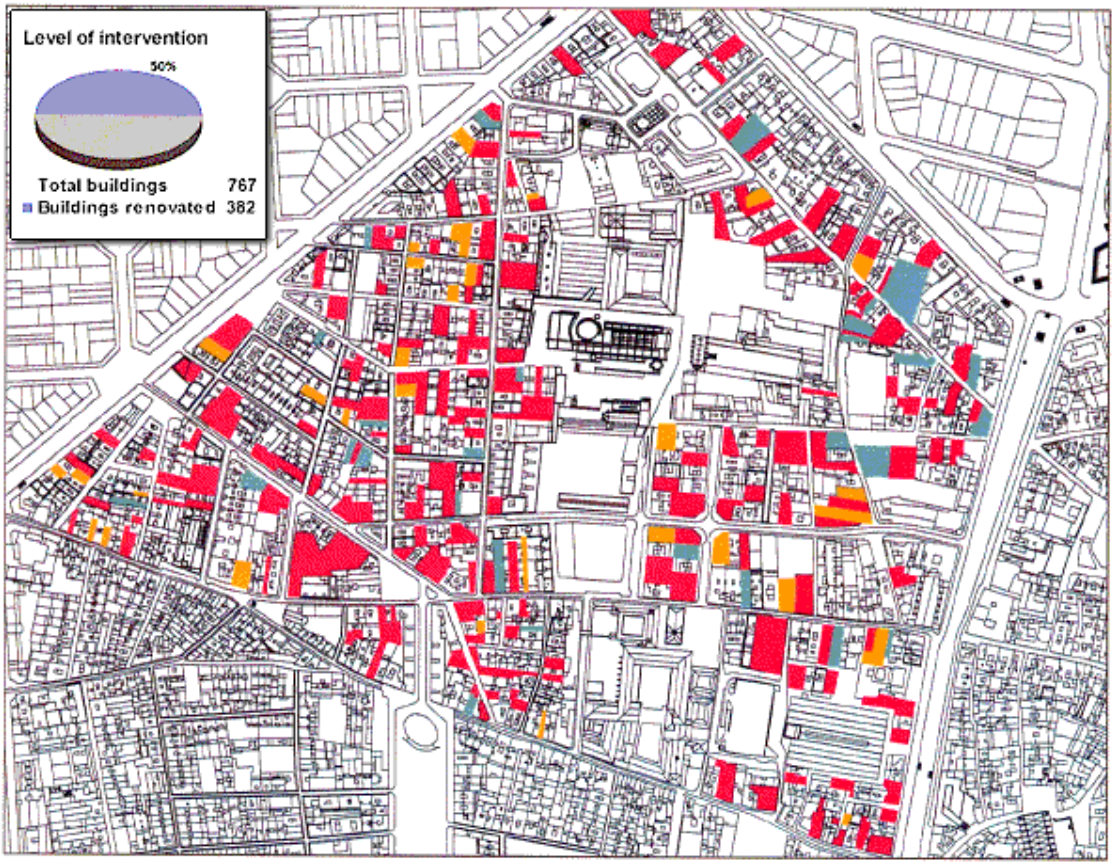
4. Building renovation

5. Land use maps

6. Cotton factories

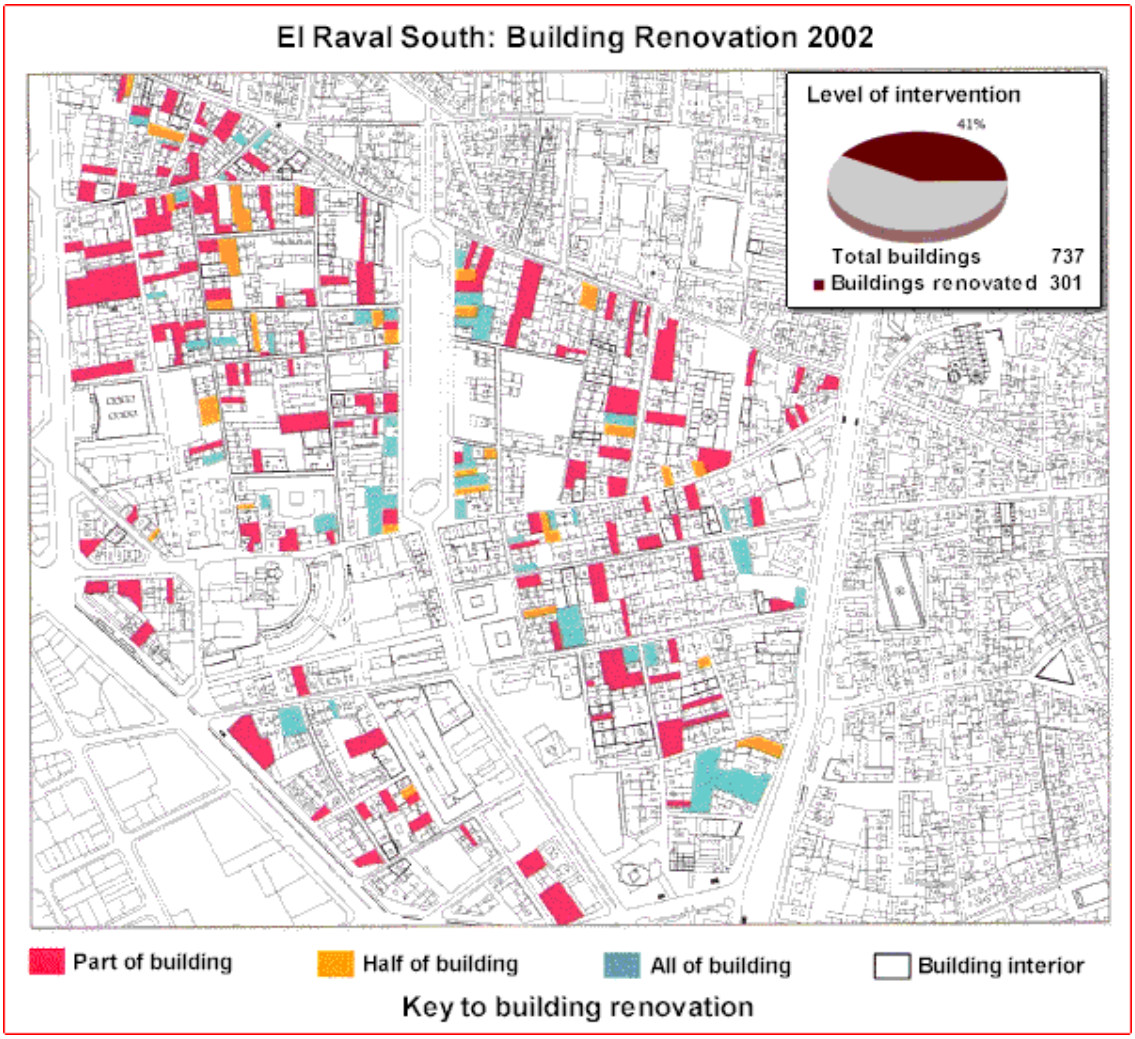
7. Raw data and the worksheets

El Raval North: Building Renovation 2002

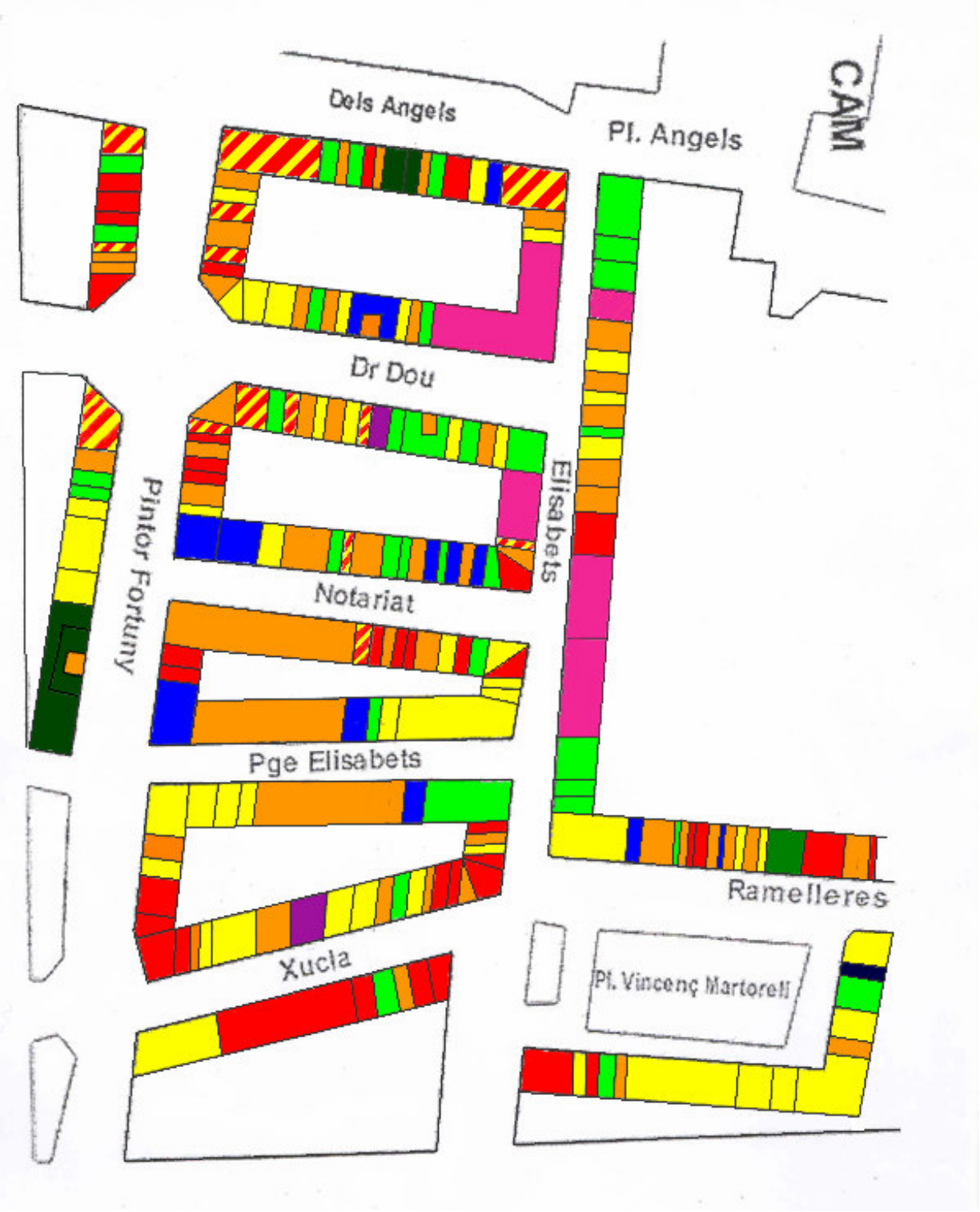


Part of building | Half of building | All of building | Building interior

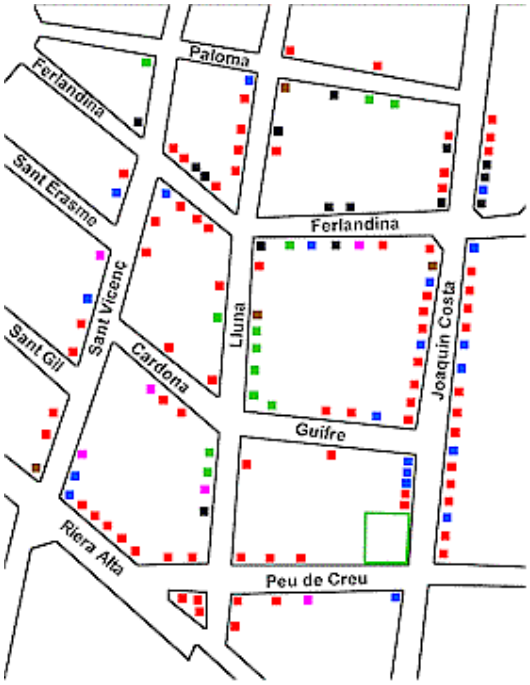
Key to building renovation



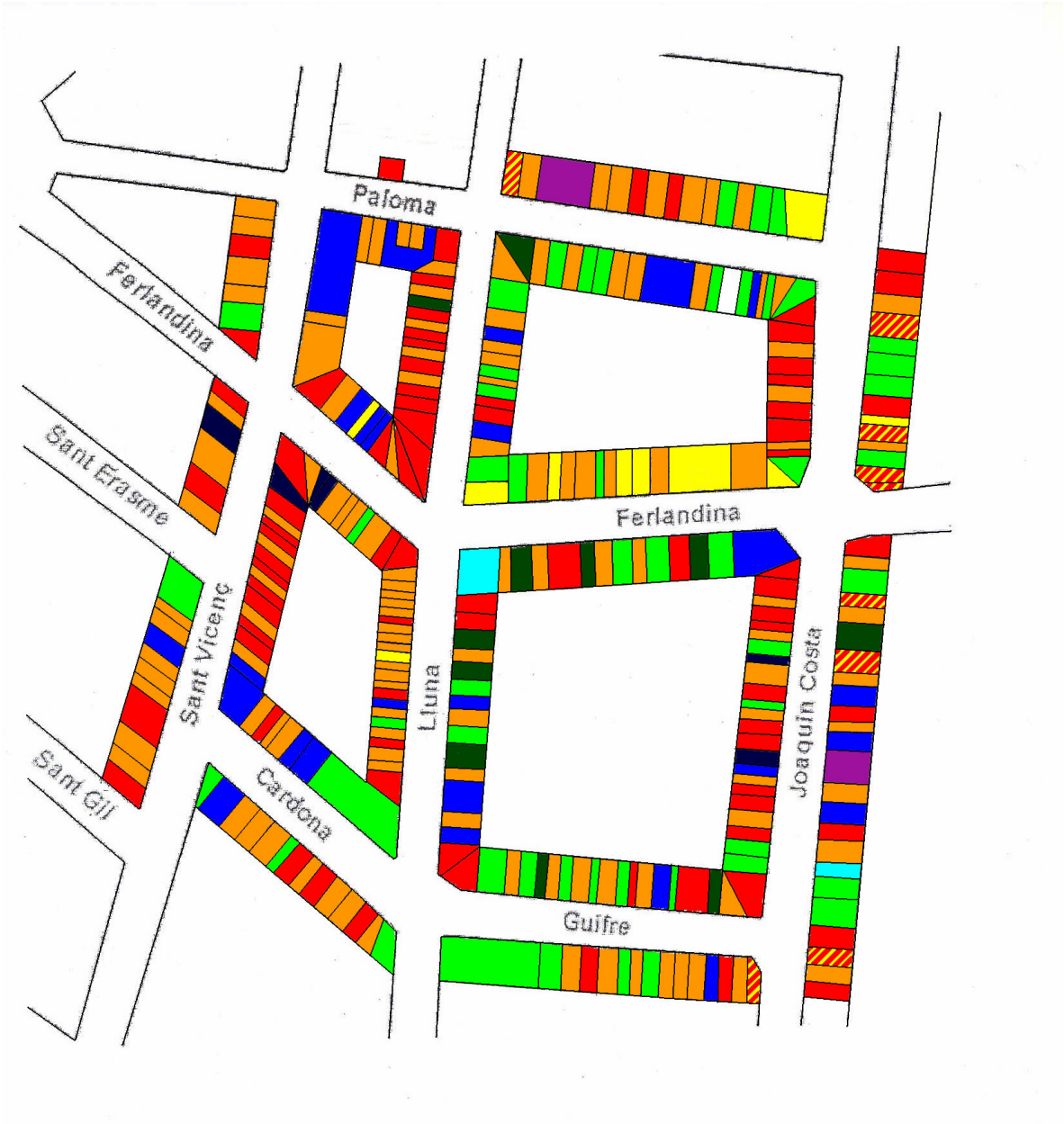
Zone 1 Land Use 2002



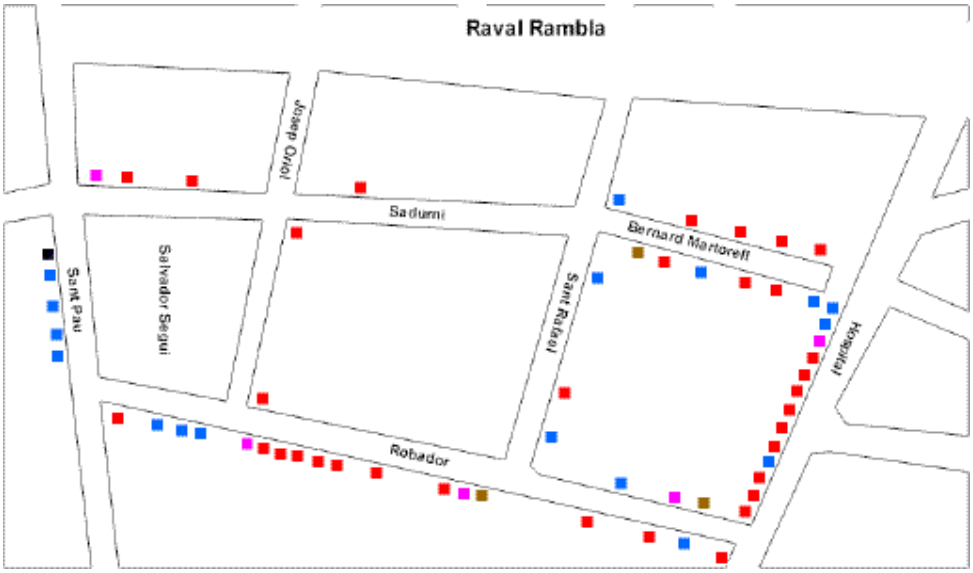
Land Use Zone 1 2003



Zone 2 Land Use 2002

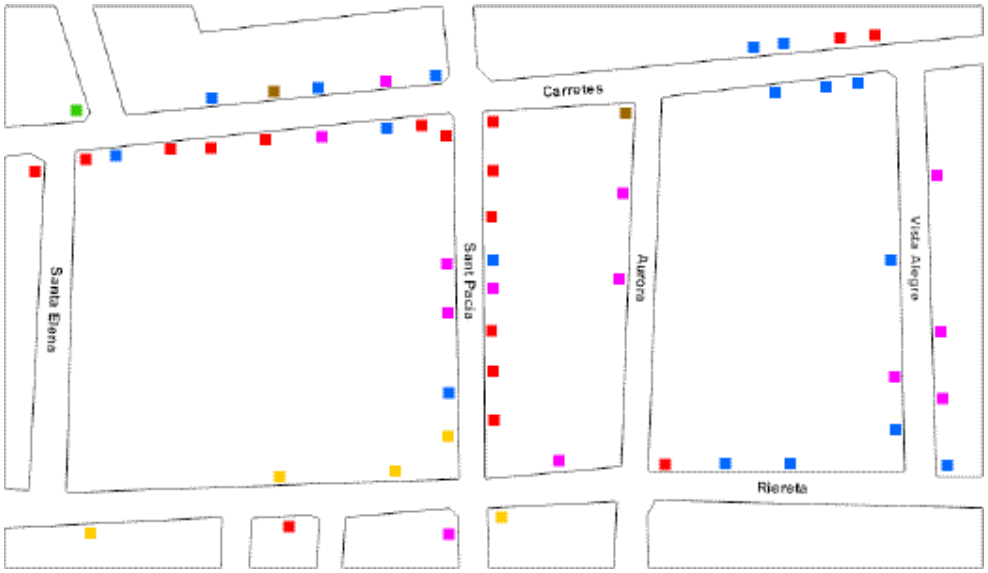


Land Use Zone 2 2003



Land Use Zone 3 2002

Land Use Zone 3 2003



Land Use Zone 4 2002

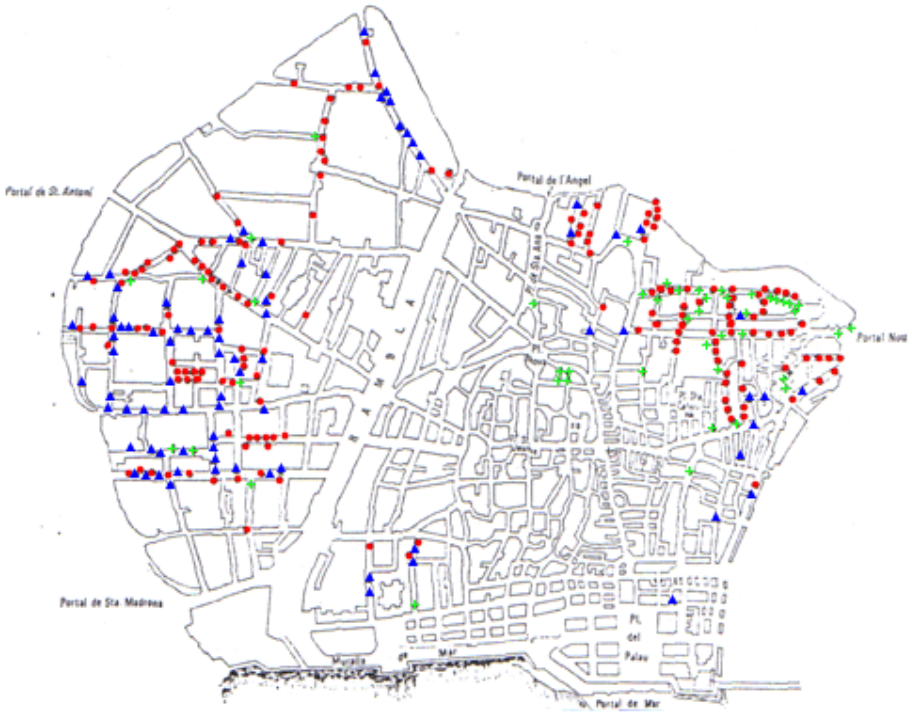
Land Use Zone 4 2003

Land Use Maps

Key for land use maps of 2002

Key for land use maps of 2003

Cotton Factories



Map showing the locations of the cotton factories in 1829.

Key

▲ Spinning

● Weaving

✚ Printed cloth