



SAMPLE B

Diploma Programme subject in which this extended essay is registered: GEOGRAPHY

(For an extended essay in the area of languages, state the language and whether it is group 1 or group 2.)

Title of the extended essay: "An Investigation into the Degree to which Hamburg can be considered a Sustainable Community"

Candidate's declaration

If this declaration is not signed by the candidate the extended essay will not be assessed.

The extended essay I am submitting is my own work (apart from guidance allowed by the International Baccalaureate).

I have acknowledged each use of the words, graphics or ideas of another person, whether written, oral or visual.

I am aware that the word limit for all extended essays is 4000 words and that examiners are not required to read beyond this limit.

This is the final version of my extended essay.

Candidate's signature: _____

Date: 23.01.2009

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A: 44731 B:

Supervisor's report

The supervisor must complete the report below and then give the final version of the extended essay, with this cover attached, to the Diploma Programme coordinator. The supervisor must sign this report; otherwise the extended essay will not be assessed and may be returned to the school.

Name of supervisor (CAPITAL letters) _____

Comments

Please comment, as appropriate, on the candidate's performance, the context in which the candidate undertook the research for the extended essay, any difficulties encountered and how these were overcome (see page 13 of the extended essay guide). The concluding interview (viva voce) may provide useful information. These comments can help the examiner award a level for criterion K (holistic judgment). Do not comment on any adverse personal circumstances that may have affected the candidate. If the amount of time spent with the candidate was zero, you must explain this, in particular how it was then possible to authenticate the essay as the candidate's own work. You may attach an additional sheet if there is insufficient space here.

The candidate took the topic of sustainability in cities as the idea for his essay.

He spent many days collecting primary data which in itself was a challenging undertaking. One piece of information he collected that particularly surprised him, was the volume of cars throughout the city, despite the excellent public transport system. ✓

In his viva voce, the candidate recognized the limitations and difficulties at measuring all aspects of sustainability and the time consuming nature of such a study. He offered ideas for development of his research essay.

I have read the final version of the extended essay that will be submitted to the examiner.

To the best of my knowledge, the extended essay is the authentic work of the candidate.

I spent hours with the candidate discussing the progress of the extended essay.

Supervisor's signature: _____ Date: 25/07/09

GEOGRAPHY EXTENDED ESSAY

Candidate Number:

Name:

Word Count: 3999 ✓

2009

An Investigation into the Degree to which Hamburg can be Considered a Sustainable Community



Abstract

This Extended Essay attempts to evaluate the degree to which Hamburg can be considered a sustainable city. The Egan Wheel is a model of sustainability which takes into account several contributing factors of sustainability such as governance, transport, services, economy and culture. The hypothesis of this extended essay states that "according to the Egan Wheel, Hamburg is a sustainable city".

In order to test the hypothesis, primary data is collected and analysed to assess certain aspects of the Egan Wheel and so as to determine Hamburg's level of sustainability. Using a random number table, an area of study was selected within each of the seven districts of Hamburg. At each location six different surveys and a questionnaire was carried out, each contributing to the evaluation of the different factors of sustainability adapted from the Egan Wheel.

The surveys consisted of the 'Bi-Polar Landscape Evaluation Survey', 'Bi-Polar Environmental Quality Survey', 'House Quality Index', 'Car and Pedestrian Count', 'Shopping Environment Evaluation Survey' and the 'Amenity Index'. To then gain a general idea of the level of sustainability of Hamburg, the mean average was taken from each of the surveys. The responses to the questionnaire offer an insight into the public's views on the various aspects of sustainability.

Time restraint was an unfortunate disadvantage while carrying out this investigation. Realistically, an evaluation of sustainability requires far more extensive research than was possible in this fieldwork study.

The complexity of the subject of sustainability, with its numerous varying definitions, makes such an investigation difficult. This entire project is based on the understanding of the Egan Wheel as a general model of sustainability, disregarding other possible models of sustainability.

Based on the data collected and the adaptation of the model of sustainability the hypothesis is accepted, after concluding that Hamburg successfully achieves the standards of the Egan Wheel.

298 words

Acknowledgements

I would like to thank my Extended Essay supervisor, _____, for her valuable advice and guidance.

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Not now!

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Introduction

The aim of this investigation is to analyse and assess the level of sustainability on a local scale. Sustainable development is a forever growing concern of today as cities and populations continue to grow. It has become a matter of recent political discussion, brought up in the conference on environment and development held in Rio de Janeiro in June 1992. During the conference, a global plan, referred to as "Agenda 21", was formulated. Agenda 21 is a programme for global sustainable action in the 21st century. Each city is obliged to have a sustainable development scheme adapted from the "Agenda 21". In this investigation, the extent to which Hamburg, Germany has been successful in creating a sustainable community will be evaluated.

Research Question

"To what extent can Hamburg be considered to be a sustainable city?"

✓ Good RQ - difficult to answer.

Hypothesis

"According to the 'Egan Wheel'¹, Hamburg is a sustainable city²"

Justification and Geographical Background

The Knifton Model

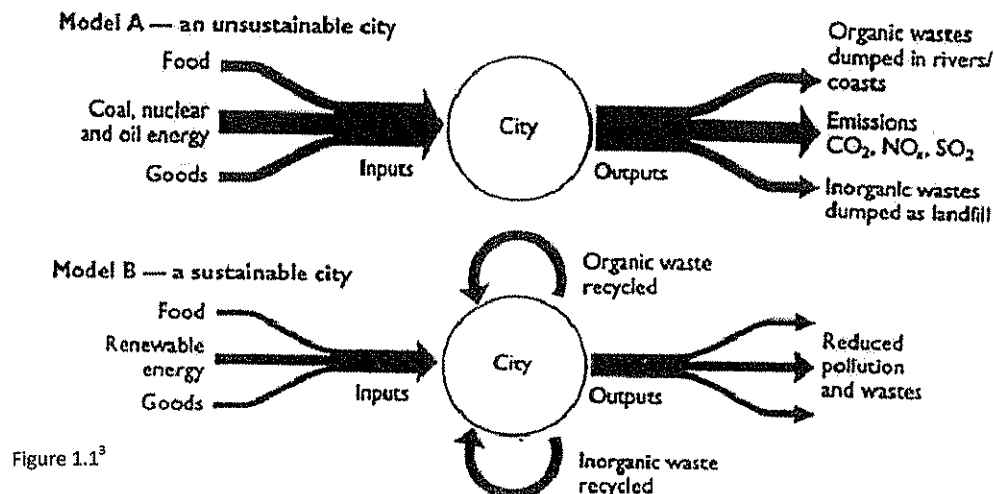


Figure 1.1³

Above is one example of a model of sustainability (The Knifton Model). It is clear that this particular model was devised with regard to only a city's use and reuse of resources. However, it has been later understood, that a sustainable city has to show concern for far more than just its resources.

¹ http://www.geographyteachingtoday.org.uk/images/text/FW_LL_Milton_Keynes_article.pdf, 25/12/2008, 20:34

² "Sustainable communities are communities planned, built, or modified to promote sustainable living" - http://en.wikipedia.org/wiki/Sustainable_community

"A sustainable community uses its resources to meet current needs while ensuring that adequate resources are available for future generations." - <http://dhis.dos.state.fl.us/fgils/agencies/sust/gloss.html>

³ http://www.geographyteachingtoday.org.uk/images/text/FW_LL_Milton_Keynes_article.pdf, 25/12/2008, 21:16

In 2004 Sir John Egan, an influential industrialist and businessman, suggested that a sustainable community must satisfy "the diverse needs of existing and future residents, their children and other users."⁴ Egan further stated that in order to do so, communities must:

- Make effective use of natural resources
- Enhance the environment
- Promote social cohesion and inclusion and
- Strengthen economic prosperity.

From this, Egan introduced what is known as the 'Egan Wheel' (Figure 1.2, p.3), which can be used to assess whether or not a community is sustainable.

The Egan Wheel

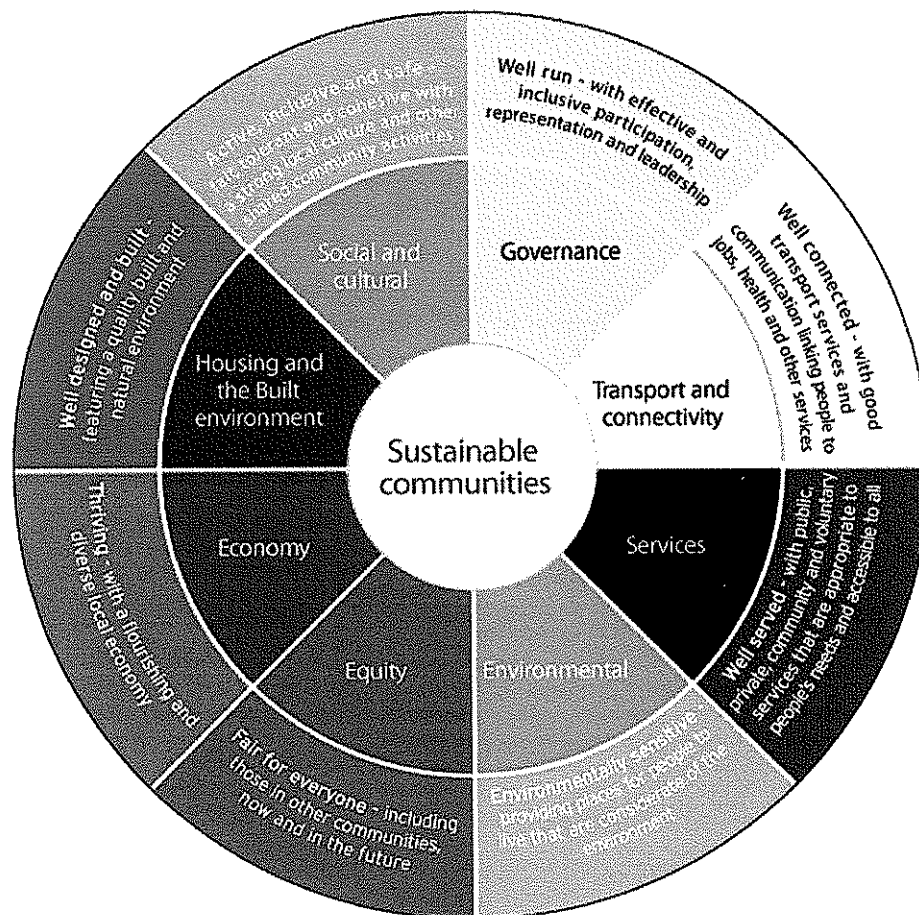


Figure 1.2⁵

All components shown in diagram 1.2 are necessary to take into consideration when assessing a regions level of 'sustainability'. A sustainable community does not just ensure that it uses "natural products and energy in a way that does not harm the environment"⁶, but also meets the social needs of its people with regard to resources, equity, economy, connectivity, public services, hospitality and culture.

⁴ <http://www.geographyteachingtoday.org.uk> , 24/7/2008, 16:51

⁵ <http://www.microcoaches.co.uk> , 24/7/2008, 16:42

⁶ http://www.oup.com/oald-bin/web_getald7index1a.pl , 25/12/2008, 13:18

KA

The Egan Wheel Shown in a Table

Why? Table or diagram sufficient

<i>Components of a Sustainable Community</i>	<i>Description</i>
Governance	"Well run, with effective and inclusive participation, representation and leadership"
Transport and connectivity	"Well connected, with good transport services and communication linking people's jobs, health and other services"
Services	Well served, with public, private, community and voluntary services that are appropriate to people's needs and accessible to all"
Environment	"Environmentally sensitive, providing places for people to live that are considerate of the environment"
Equity	"Fair for everyone, including those in other communities now and in the future"
Economy	"Thriving, with a flourishing and diverse local economy"
Housing and the Built Environment	"Well designed and built, featuring a quality built and natural environment"
Social and Cultural	"Active, inclusive and safe; fair, tolerant and cohesive with a strong local culture and other shared community activities"

Figure 1.3⁷

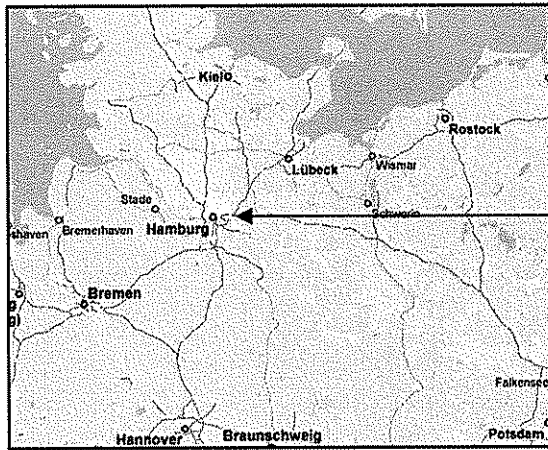
As Germany gave wide approval of the objectives set forth in Agenda 21, it can be expected that now, 15 years on, Hamburg as a major city of Germany has implemented successful sustainable development strategies, thus fitting the Egan Wheel.

⁷ Adopted from the Egan Wheel

Area of Study

The area selected for this fieldwork study of sustainability was Hansastadt Hamburg (HH). Hamburg has approximately 1 800 000 inhabitants and a total area of 755 km².

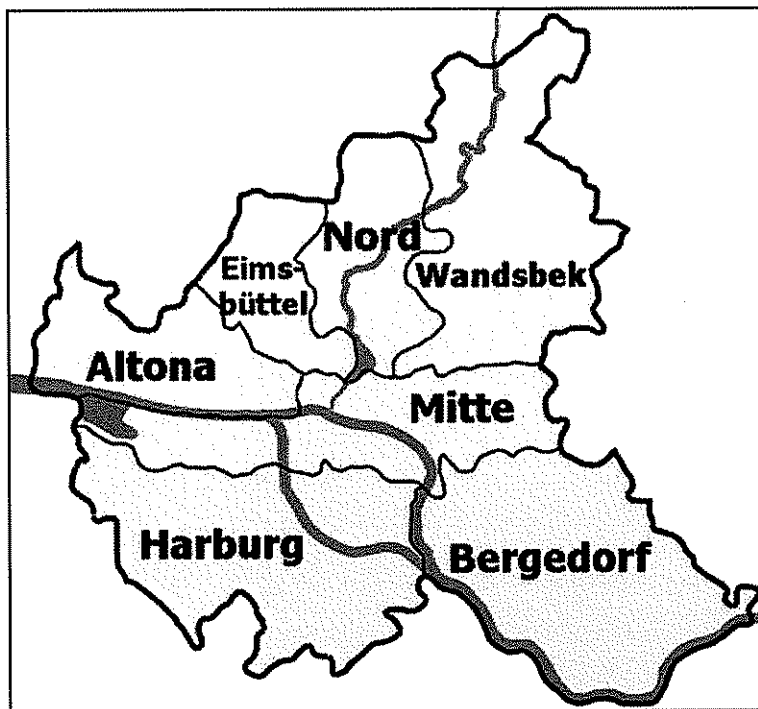
Map Showing North Germany



Hamburg is located in North Germany, roughly 150km from the Danish border.

Figure 1.4⁸

Sketch Map to Show the Seven Districts of Hamburg



The city of Hamburg is divided into 7 districts (Bezirke). This project aims to collect data from each of the 7 districts. The exact location of investigation within each of the 7 districts was obtained through a random sampling method shown on the following page

Figure 1.5⁹

⁸ <http://maps.google.de/> , 16/1/2009, 15:06

⁹ <http://de.wikipedia.org/wiki/Hamburg> , 25/7/08, 17:24

Sampling Technique used to select sites for the study
 – Random Sampling

Sampling techniques are necessary when carrying out a fieldwork in order to eliminate any biases, and effectively obtain accurate representative data of the area of study.

In order to select the area of primary data collection within the 7 districts, the table below (figure 1.5) is used. Each of the districts is again divided into smaller towns, numbered below. By then randomly selecting a number from each of the 5 columns (districts) using a random number table¹⁰, 7 locations are selected without the effects of bias.

sub-districts
 ? ✓

Altona	Eimsbüttel	Hamburg – Nord	Wandsbek	Hamburg – Mitte	Bergedorf	Harburg
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9
10		10	10	10	10	10
11		11	11	11	11	11
12		12	12	12	12	12
13		13	13	13	13	13
			14	14		14
			15	15		15
				16		16
				17		17
				18		
				19		

Figure 1.5

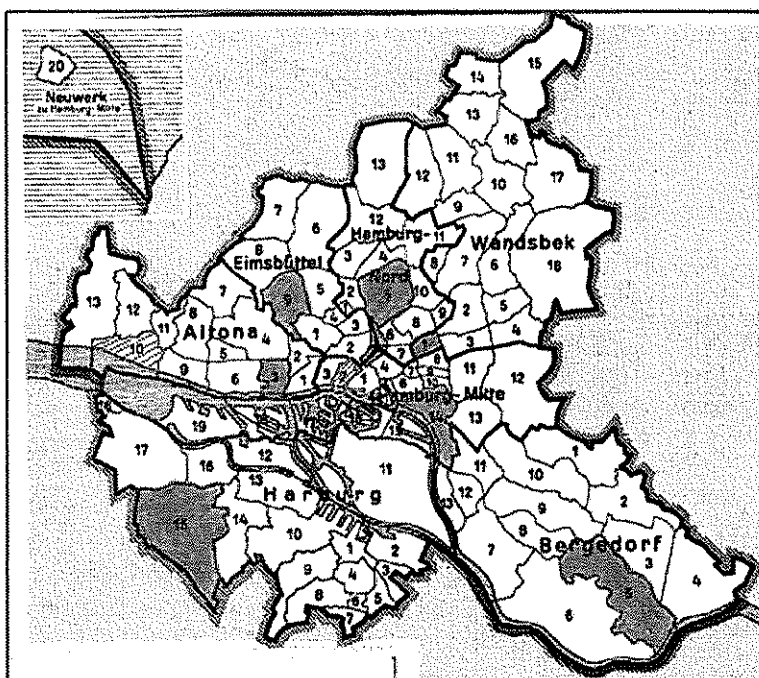
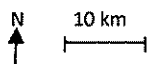


Figure 1.6

The seven precise areas of study with the seven districts of Hamburg are:

- Altona – Königstrasse
- Eimsbüttel – Hoheluftbrücke
- Hamburg-Nord – Alsterdorf
- Wandsbek – Ritterstrasse
- Hamburg-Mitte – Legienstrasse
- Bergedorf – Nettelburg
- Harburg – Neugraben

Two further areas were objectively selected in “Altona” and “Hamburg-Mitte” in order to give a more accurate sample of data, representing the characteristics of the area (these two areas are marked in green on figure 1.6).

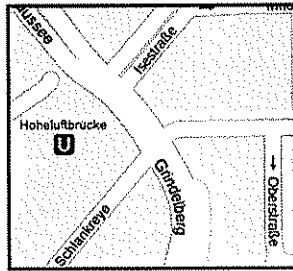
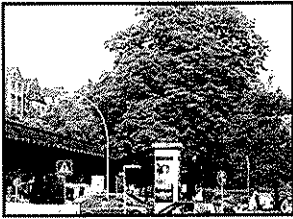
¹⁰ Random Number Table shown in appendices

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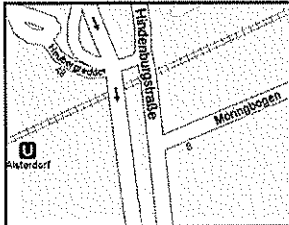
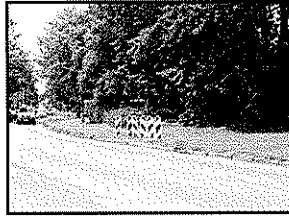
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Good

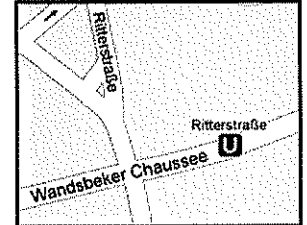
Eimsbüttel
- Hoheluftbrücke



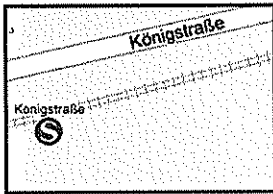
Nord
- Alsterdorf



Wandsbek
- Ritterstrasse



Altona
- Königstrasse



Mitte
- Legienstrasse

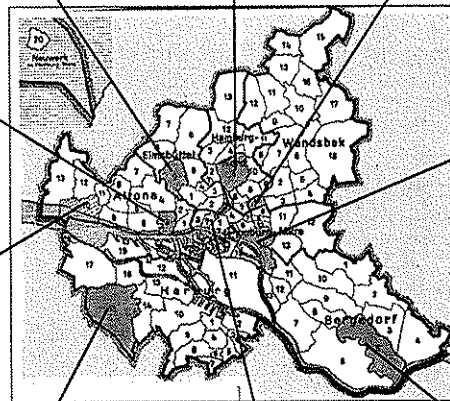
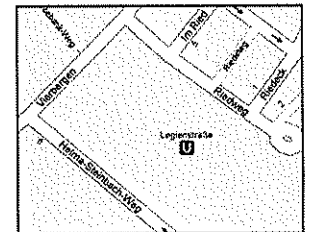
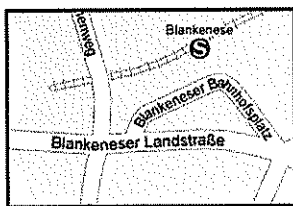
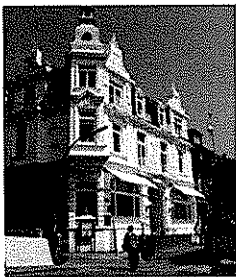
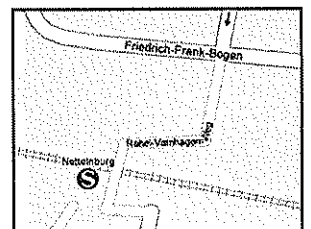


Figure 1.7
N 30km
↑

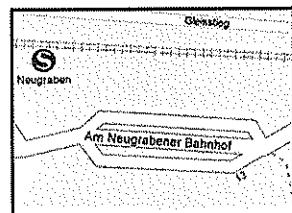
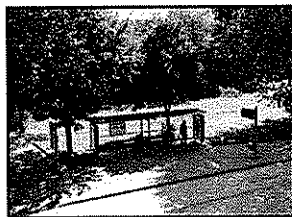
Altona
- Blankenese



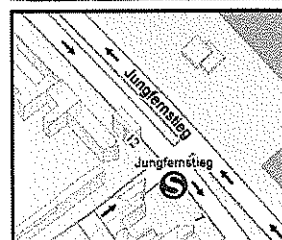
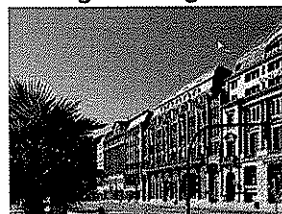
Bergedorf
- Nettelburg



Harburg
- Neugraben



Mitte
- Jungfernstieg



For all road maps:
N 100m
↑

All road maps taken from www.google.com/maps.

Well presented.

Handwritten signature/initials.

Methods of Data Collection

The data collected for this fieldwork study is aimed at assessing the level of sustainability in the city of Hamburg, with regard to the Egan Wheel (figure 1.2, p.2). The data will, if successful, provide an insight into several elements of a sustainable community, namely: Transport and connectivity, services, the environment, housing and the built environment, social and cultural aspects and perhaps some indication of the economy and governance.

Below are the seven different methods of **primary** data collection:

- *Landscape Evaluation*
 - o *Bi-Polar Landscape Evaluation Survey*
- *Environmental Quality*
 - o *Bi-Polar Environmental Quality Survey*
- *House Quality*
 - o *House Quality Index*
- *Traffic and Pollution*
 - o *Car and Pedestrian Count*
- *Shopping Environment*
 - o *Shopping Environment Evaluation Survey*
- *Available Amenities*
 - o *Amenity Index*
- *Questionnaire*

Below is a table illustrating which surveys are used to assess the different components of the Egan Wheel. Governance is **not** included as it is not assessable by only primary data, however insight into this factor is given through the other surveys and will be discussed.

<i>Component of a Sustainable Community</i>	<i>Method of Primary Data collection</i>
Transport and connectivity	- Questionnaire,
Services	- Questionnaire - Amenity Index
Environment	- Bi-Polar Landscape Evaluation Survey - Bi-Polar Environmental Quality Survey - Car and Pedestrian Count
Economy	- House Quality Index - Car and Pedestrian Count - Questionnaire
Housing and the Built Environment	- House Quality Index
Social and Cultural	- Car and Pedestrian Count - Shopping Environment Evaluation Survey - Amenity Index - Questionnaire

Figure 2.1

KAA

Good range of data collection methods

The Bi-Polar Landscape Evaluation Survey

This survey evaluates the landscape by taking many aspects into consideration and judging them on a bi-polar scale from -3 to 3. Each row corresponds with an individual landscape quality. Each quality will be judged appropriately, and marked with a cross in the respective space.

Positive Qualities	3	2	1	0	-1	-2	-3	Negative Qualities
Attractive views								Unattractive Views
Clean								Dirt / Polluted
Colourful								Lacking colour
Evidence of abundant wildlife								No evidence of wildlife
Interesting landscape								Uninteresting
Pleasant smells								Unpleasant smells
Quiet or pleasant noises								Loud and unpleasant noises
Sympathetic building development								Unsympathetic building development
Well managed								Neglected /unmanaged
Wide variety of vegetation								Lack of Vegetation
Column Totals:								Net Score: /30

Figure 2.2¹¹

The sum of each column is written in the last row



The last row is then summed, giving the total "Net Score" out of 30

¹¹ An example of a recording sheet for The Bi-Polar Landscape Evaluation Survey, taken from "ISH Berlin Urban Study Booklet"

The Bi-Polar Environmental Quality Survey

Similar to the Bi-Polar Landscape Evaluation Survey, the urban environment is being evaluated by grading specific characteristics of the environment. By again using a bi-polar scale from -3 to 3, each quality is judged and marked in the appropriate space. The sum of each column is summed and recorded in the last row. The last row is then summed giving a "Net Score" out of 30.

	3	2	1	0	-1	-2	-3	
Building quality Attractive, well maintained buildings in good decorative order								Derelict or rundown buildings in need of structural and decorative repair
Graffiti Buildings, walls, fences, etc free from graffiti								Graffiti covering parts of most accessible surfaces
Greenery Well maintained and healthy trees, plants and/or shrubs								No plants of few unhealthy and poorly maintained plants
Public Lighting Plentiful and well maintained public lighting in streets and alley ways								No public lighting. Streets and alleys may be dark and uninviting at night
Litter No litter to be seen at all								Rubbish (including cigarette ends and chewing gum and/or animal fouling) abundant
Noise No noise or pleasant, relaxing sounds								Frequent loud disturbing noises that make is difficult to hold a conversation
Open Space Large areas of open space that allow for individual privacy								Enclosed, overcrowded spaces in which individual private space is absent
Smell Air is fresh and pleasant to breathe, possibly with pleasant odours								Air is seriously polluted with unpleasant odours such as fumes or vehicle exhausts
Street Furniture Sufficient and attractive street furniture in good condition								No, or poor quality, street furniture that is unattractive and obtrusive
Vandalism No sign of deliberate vandalism								Serious vandalism including obvious deliberate damage to windows, walls, fences, street furniture, cars and/or plants
Column Totals:								Net Score: /30

Figure 2.3¹²

¹² An example of a recording sheet for The Bi-Polar Environmental Quality Survey, taken from "ISH Berlin Urban Study Booklet"

The House Quality Index

This survey evaluates the quality of housing and the built environment. Down the centre column is a list of different qualities which will be assessed. A cross is put in the appropriate space in each row, determining the condition of each quality. Each column is then summed and recorded in the row labelled "Column Totals". This row is then summed, again giving a "Net Score" out of 16.

None	Broken		Original	New
-2	-1		1	2
		Roof		
		Pointing		
		Paintwork		
		Windows		
		Gutters/pipes		
		Door		
		Fence/wall		
		State of Building		
		Column Totals		
Net Score			/16	

Figure 2.4¹³

Note: for "State of Building"; -2: lopsided, -1: large cracks, 1: few cracks, 2: no cracks

The Car and Pedestrian Count

This particular survey is to investigate whether or not cars are used excessively Hamburg. The number of vehicles travelling in both directions in one minute will be recorded. The same will be done for the number of pedestrians that go past in either directing, in one minute.

	Number of people walking both ways in 1 minute:	
	Number of vehicles travelling both ways in 1 minute:	
Total Score:	(Number of people) – (Number of cars):	

Figure 2.5¹⁴

*15 one
minute
enough?*

KUB

¹³ An example of a recording sheet for **The House Quality Index**, taken from "ISH Berlin Urban Study Booklet"

¹⁴ An example of a recording sheet for **The Car Pedestrian Count**, taken from "ISH Berlin Urban Study Booklet"

The Shopping Environment Evaluation Survey

This survey evaluates how well established the environment is for shopping, considering traffic, quality of goods, safety and types of land use. Each category from A to J is graded (1 to 5) according to its description in the column to right. The score from each category is then summed giving a "Net Score" out of 50, which is recorded in the bottom right space.

Importance		Description	Score
A	Land Use	Almost entirely shops	5
		Shops, banks, building societies	4
		Mainly shops with a few offices, food outlets and other services	3
		Mixture of shops, food outlets, offices, and other land uses	2
		Very few shops, mainly housing or industry	1
B	Types of Shops	Dominated by department store(s) / quality variety stores	5
		Wide variety of comparison shops (e.g. clothing, shoes)	4
		Mixture of comparison and specialist stores (e.g. electrical, cameras, etc)	3
		Mixture of convenience and specialist stores	2
		Variety of shops, convenience goods dominant	1
C	Retail Organisations	National chain-stores dominant	5
		Some national chain stores and some independent retailers	4
			3
		Small independent shop units and / or market stalls	2 1
D	Quality of Goods	High quality / high value goods	5
		A mixture of quality / value – some bargains	4 3
			2
		Low quality / low value goods	1
E	Traffic/Pedestrian Separation	Entire area is pedestrianised and enclosed (shopping centre or precinct)	5
		Completely pedestrianised area with open air streets	4
		Pedestrianised but some limited access for buses, delivery vehicles, etc.	3
		Open to all traffic but with no parking or strict parking restrictions	2
		Busy route for traffic, few if any parking restrictions	1
F	Pedestrian Safety	Very Safe – No vehicle access	5
		Busy traffic but with traffic light controlled pedestrian crossing(s)	4
		Busy traffic but with zebra crossing(s)	3
		Busy street with wide pavement but no controlled crossing points	2
		Busy street with narrow pavement and no controlled crossing points	1
G	Number of Shoppers	Very busy with many shoppers frequently entering and leaving shops	5
		Quite busy; a reasonable number of people entering and leaving shops	4 3
		Quiet, few shoppers, most shop doors remain shut for extended periods	2 1
H	Exterior Appearance of Shops	Well maintained with attractive shop fronts and window displays	5
			4
		Well maintained with functional window displays – window posters	3
		Dirty. Poorly maintained buildings. Very drab	2 1
I	Vacant Premises	All premises occupied	5
			4
		A small number of vacant premises in the stages of renewal	3
		2	
		Mainly vacant premises or demolished buildings	1
J	Street Cleanliness & Maintenance	Very clean with no litter or broken paving stoned (or kerb stones)	5
		Quite clean with little litter and very few damaged surfaces	4
		Generally tidy with the occasional item of litter or broken paving stone	3
		Infrequently cleaned with some litter and some broken paving	2
		Dirty, serious litter problem and neglected broken paving	1
Total score			/50

Figure 2.6¹⁵

Comprehensive!

¹⁵ An example of a recording sheet for The Shopping Environment Evaluation Survey, taken from "ISH Berlin Urban Study Booklet"

The Amenity Index

The amenity index is a survey in which there is list of a variety of amenities (below, figure 2.9), which, if seen in the area, are marked. This evaluates how well established each district is with the necessary amenities and services.

Amenity	Present
Health Dentist Doctor Clinic Hospital	
Education Nursery School Primary School Secondary School	
Retail Newsagents Bakery Greengrocers Meat Shop Supermarket Launderette Other	
Services Bank Building Society Hairdressers Restaurant Fast Food Point	
Leisure Park Swimming Pool Sports Centre Other	
Communication Bus Stops Train Stops Post Box Phone Box	
Community Church Hall Library Town Hall	

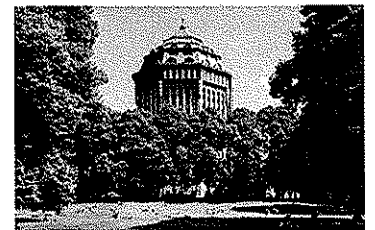
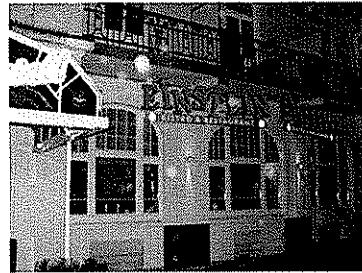
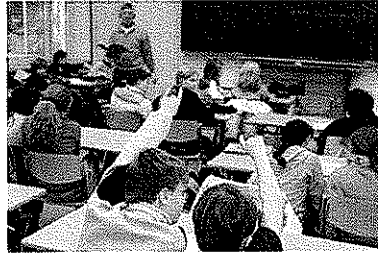


Figure 2.7¹⁶

In each area the number of amenities found (from figure 2.7) is summed to give a total amenity index score out of a possible 30.

¹⁶ An example of a recording sheet for The Amenity Index, taken from "ISH Berlin Urban Study Booklet"

The Questionnaire

The questionnaire includes eight questions, all aimed at individual qualities and aspects of a sustainable society. The questionnaire will be given to 20 individuals in each district, attempting to achieve the greatest diversity in culture, age and ethnic background.

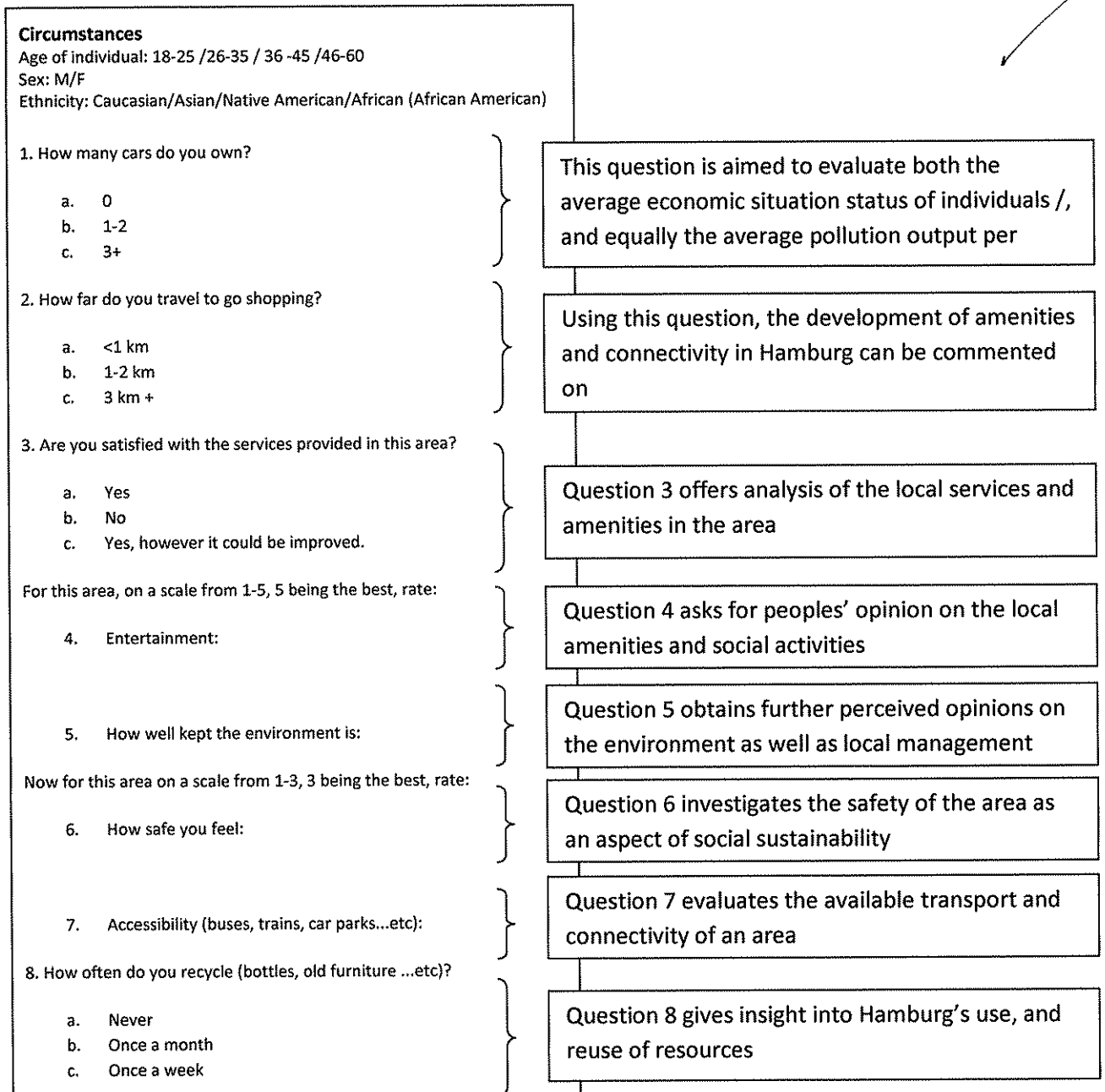


Figure 2.8¹⁷

Note: Due to the fact that Hamburg is a German speaking city, the questionnaire will be translated into German.

A pilot survey was done prior to the fieldwork in order to test the effectiveness of the questionnaire. People were systematically selected from ages between 18 and 60. The pilot survey verified the questionnaire seeing as no anomalies were obtained and all questions were answered appropriately, providing precise, efficient data.

Good
Questions clearly justified

¹⁷ An example of The Questionnaire

MA

Data Presentation

All surveys were carried out in the nine areas around Hamburg under these circumstances:

District	Eimsbüttel
Location	Höheluftbrücke
Date	10/07/2008
Time	15:00
Weather	Cloudy
Colour	Dark Green

District	Nord
Location	Alsterdorf
Date	11/07/2008
Time	14:10
Weather	Cloudy
Colour	Purple

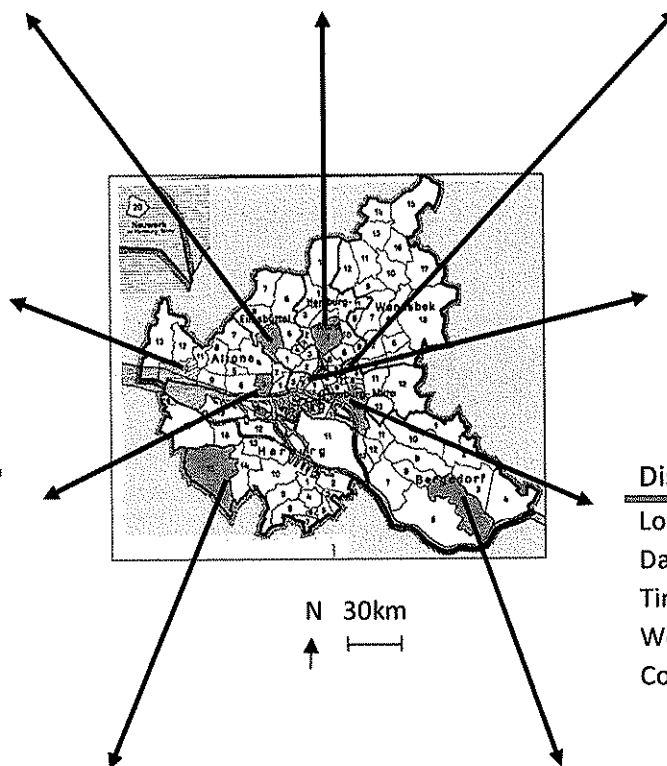
District	Wandsbek
Location	Ritterstrasse
Date	07/07/2008
Time	10:45
Weather	Sunny
Colour	Light Blue

District	Altona
Location	Blankenese
Date	07/07/2008
Time	15:30
Weather	Cloudy
Colour	Dark Blue

District	Mitte
Location	Legienstrasse
Date	09/07/2008
Time	15:00
Weather	Cloudy
Colour	Gray

District	Altona
Location	Königstrasse
Date	08/07/2008
Time	12:15
Weather	Cloudy
Colour	Red

District	Mitte
Location	Jungfernstieg
Date	14/07/2008
Time	14:00
Weather	Sunny
Colour	Orange



District	Harburg
Location	Neugraben
Date	16/07/2008
Time	13:30
Weather	Cloudy
Colour	Light Green

District	Bergedorf
Location	Nettelburg
Date	15/07/2008
Time	14:15
Weather	Sunny
Colour	Pink

Figure 3.1

Clearly presented.

[Handwritten mark]

The tables below display the total score each area achieved in each of the different surveys. The method through which the totals are obtained is explained in "Method of Data Collection".

Figure 3.2

District Exact Location	Altona	Altona	Eimsbüttel	Nord
	Blankenese	Königstrasse	Hoheluftbrücke	Alsterdorf
Method of Data Collection	Totals for each Method of Data Collection			
<i>Bi-Polar Landscape Evaluation Survey</i>	16	-3	10	9
<i>Bi-Polar Environmental Quality Survey</i>	13	1	15	9
<i>House Quality Index</i>	15	12	16	14
<i>Car and Pedestrian Count</i>	-19	-49	-25	-41
<i>Shopping Environment Evaluation Survey</i>	35	31	43	23
<i>Amenity Index</i>	26	11	24	13

District Exact Location	Wandsbek	Mitte	Mitte	Bergedorf	Harburg
	Ritterstrasse	Jungfernstieg	Legienstrasse	Nettelburg	Neugraben
Method of Data Collection	Totals for each Method of Data Collection				
<i>Bi-Polar Landscape Evaluation Survey</i>	-6	20	9	18	16
<i>Bi-Polar Environmental Quality Survey</i>	4	22	11	16	16
<i>House Quality Index</i>	14	16	13	15	13
<i>Car and Pedestrian Count</i>	-43	62	34	9	-3
<i>Shopping Environment Evaluation Survey</i>	25	47	17	21	19
<i>Amenity Index</i>	22	20	26	26	23

To illustrate the data in a comparable and coherent manner, all the data is converted to a universal unit scale. The conversion is shown in the table below.

Figure 3.3

Method of Data Collection	Available Score	To fit to a scale from -3 to 3	1 Unit on scale -3 to 3
<i>Bi-Polar Landscape Evaluation Survey</i>	-30 to 30	60/6	10 = 1 unit
<i>Bi-Polar Environmental Quality Survey</i>	-30 to 30	60/6	10 = 1 unit
<i>House Quality Index</i>	-16 to 16	32/6	5.33 = 1 unit
<i>Car and Pedestrian Count</i>	-100 to 100	200/6	33.33 = 1 unit
<i>Shopping Environment Evaluation Survey</i>	0 to 50	50/6	8.33 = 1 unit
<i>Amenity Index</i>	0 to 30	30/6	5 = 1 unit

Below is an example of how a total score is converted into the unit scale, represented on a graph (figure 3.1)

Figure 3.4

District Exact Location	Altona				
	Blankenese	Total	1 unit	Covert total into units	Value on Scale (-3 to 3)
<i>Bi-Polar Landscape Evaluation Survey</i>		16	10	16/10	$((16/10)+(60/2)) - 3$ =1.6

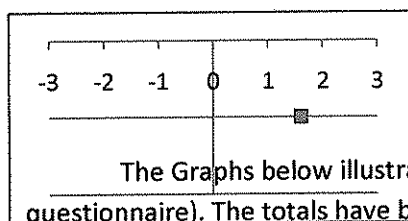


Figure 3.4

The Graphs below illustrate each area's total score obtained on six of the surveys (excluding the questionnaire). The totals have been converted into the unite scale created (from -3 to 3).

KPA

Blankenese, Altona

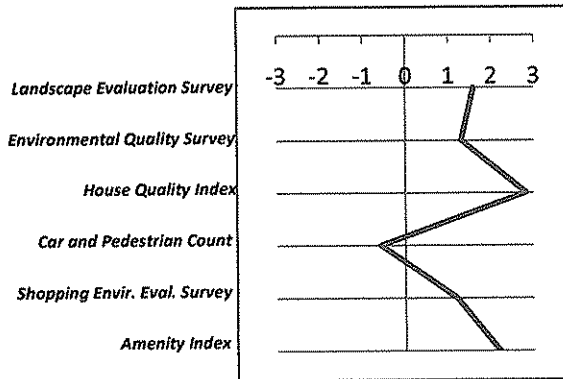


Figure 3.5

Königstrasse, Altona

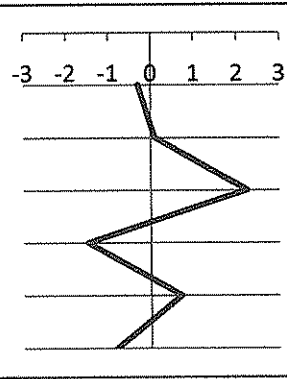


Figure 3.6

Hoheluftbrücke, Eimsbüttel

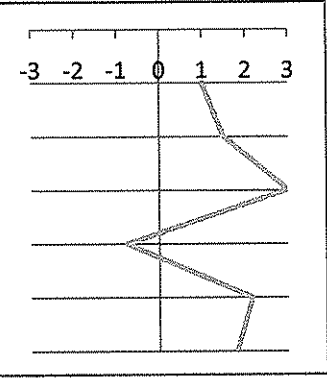


Figure 3.7

Alsterdorf, Nord

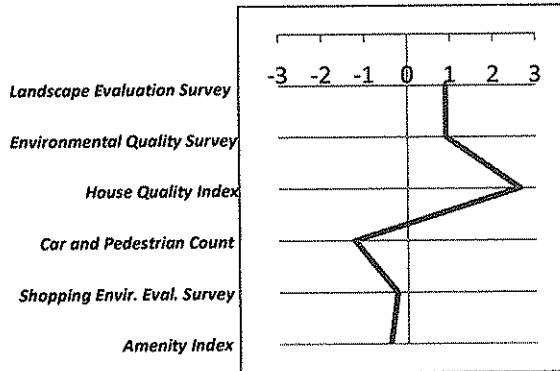


Figure 3.8

Ritterstrasse, Wandsbek

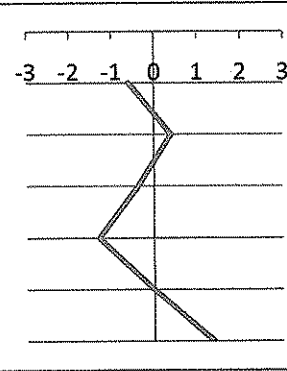


Figure 3.9

Jungfernstieg, Mitte

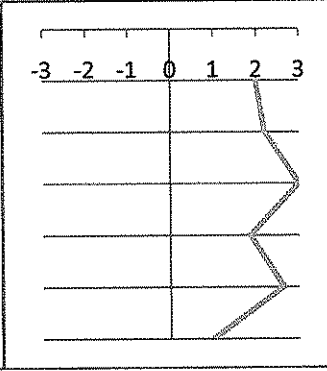


Figure 3.10

Legienstrasse, Mitte

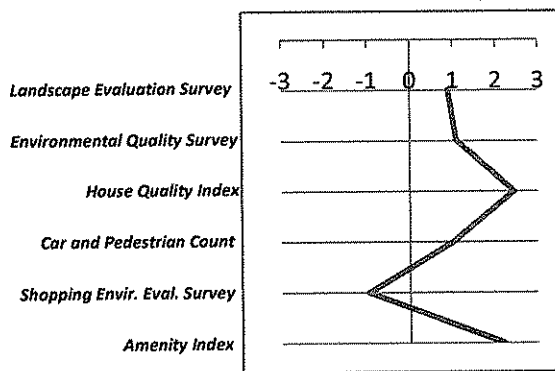


Figure 3.11

Nettelburg, Bergedorf

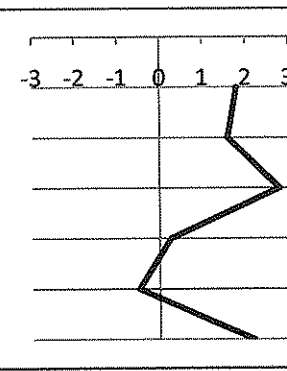


Figure 3.12

Neugraben, Harburg

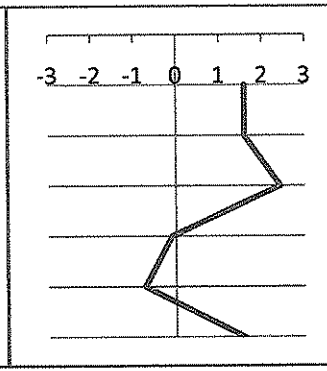


Figure 3.13

To gain a more general picture of Hamburg's level of sustainability, the average total (mean) is taken for each survey. The average is then again, converted to a unit scale from -3 to 3. This is shown in the table below.

Very interesting method of data presentation

let

The three diagrams below (figure 3. , 3. , 3.) illustrates the mean total of each survey, on a unit scale from -3 to 3.

<i>Figure 3.14</i> Method of Data Collection	Mean (2dp)	Standard Deviation (2dp)	Mean in Units on scale from -3 to 3(2dp)	Standard Deviation in Units (2dp)
<i>Bi-Polar Landscape Evaluation Survey</i>	9.89	9.10	0.99	0.91
<i>Bi-Polar Environmental Quality Survey</i>	11.89	6.49	1.19	0.65
<i>House Quality Index</i>	14.22	1.39	2.67	0.26
<i>Car and Pedestrian Count</i>	-8.33	37.72	-0.25	1.13
<i>Shopping Environment Evaluation Survey</i>	29	10.72	0.48	1.29
<i>Amenity Index</i>	21.22	5.63	1.24	1.13

- Totals shown on a unit scale graph

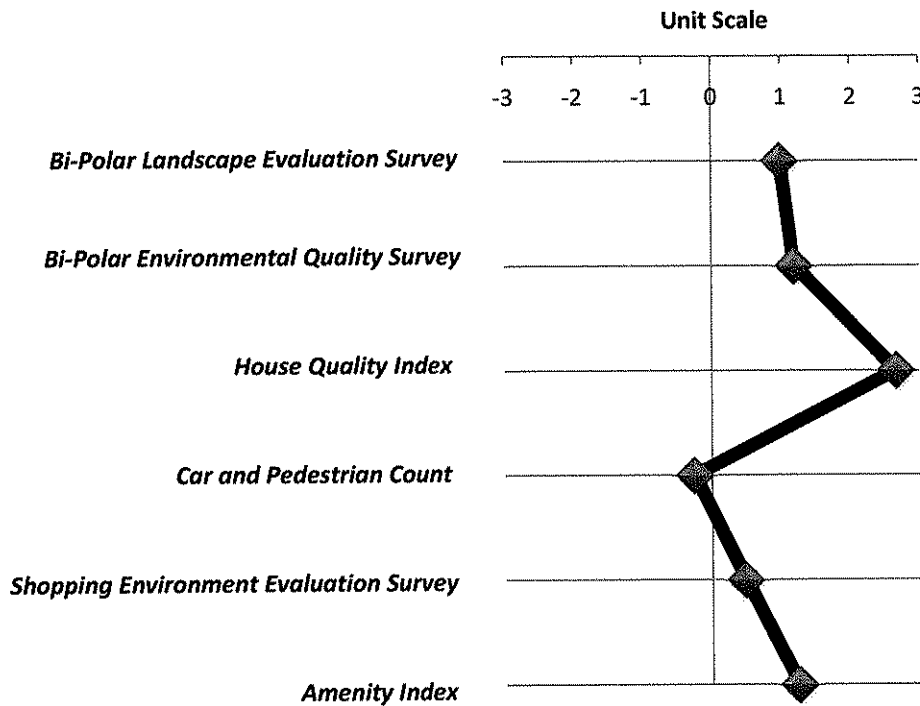


Figure 3.15

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- Totals shown on a unit scale radar graph

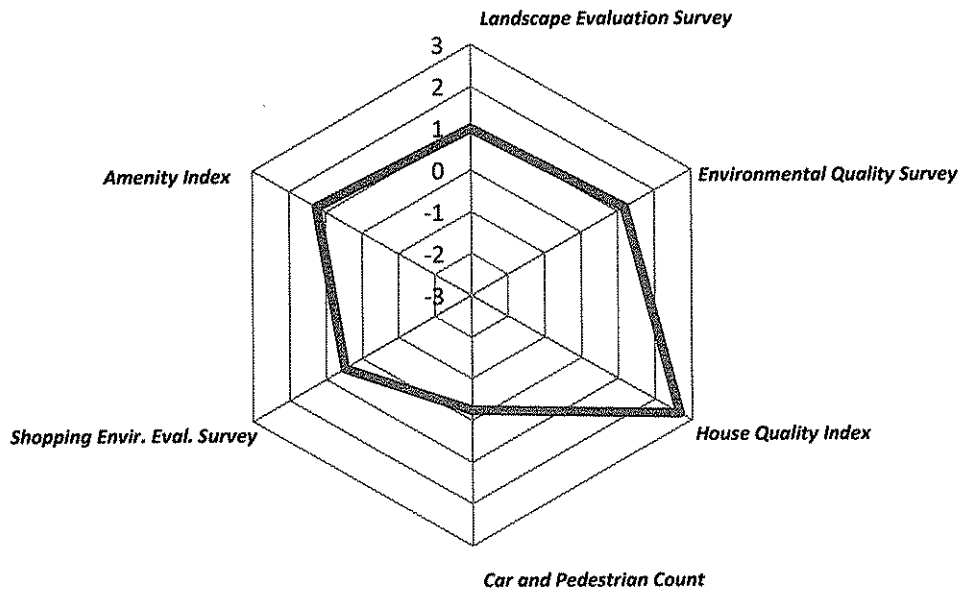


Figure 3.16

- Totals shown on a unit scale bar graph, showing Standard Deviation

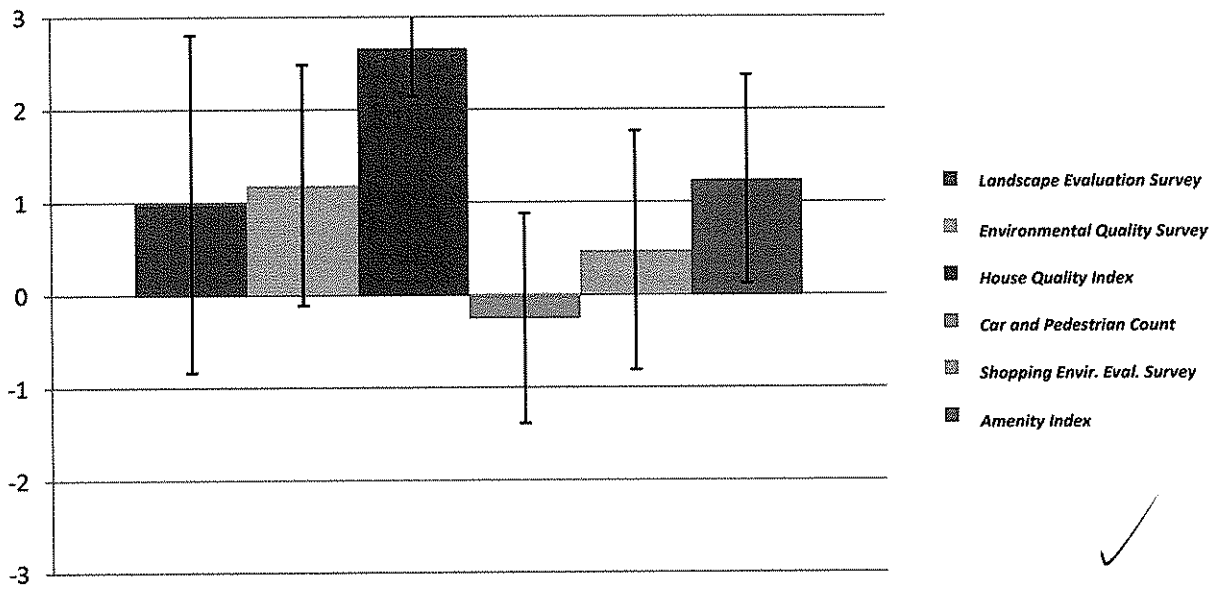


Figure 3.17

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13

The Questionnaire

The pie charts below illustrate the distribution of answers given out of the 180 people asked as a percentage. Refer back to page_ for the answers to each question.

need
Q1
or
no.
answer!

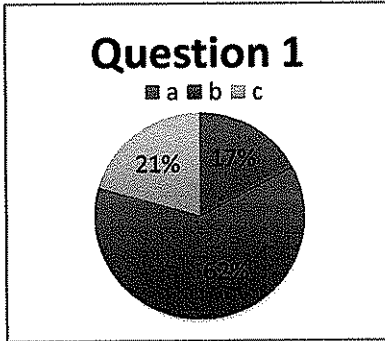


Figure 3.18

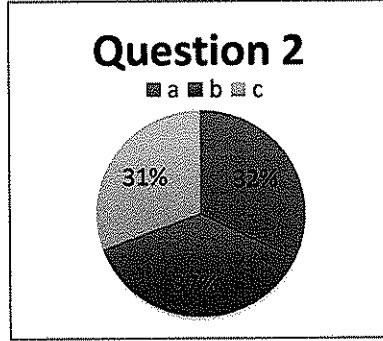


Figure 3.19

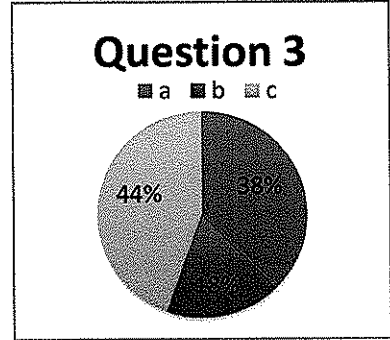


Figure 3.20

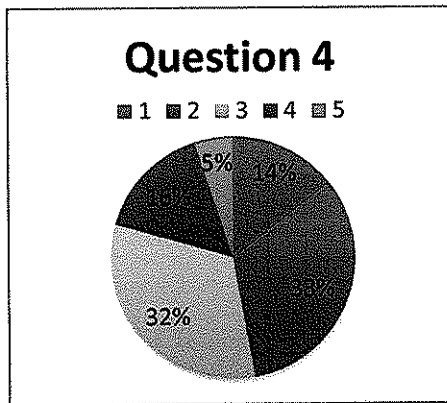


Figure 3.21

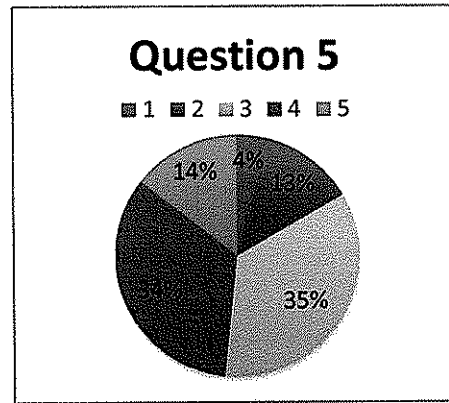


Figure 3.22

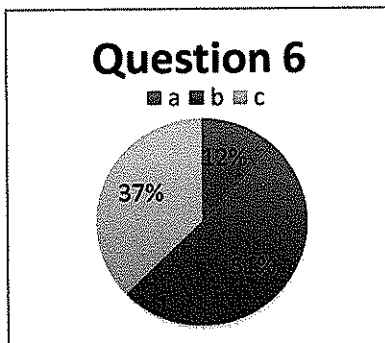


Figure 3.23

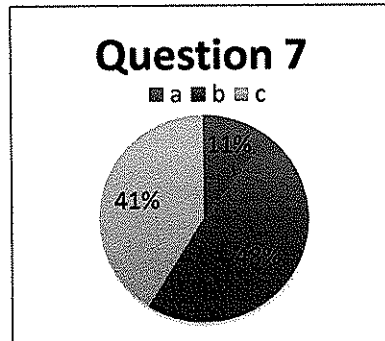


Figure 3.24

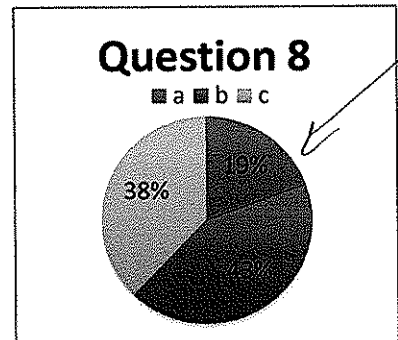


Figure 3.25

20%
never
occur...

13

Each multiple choice answer is allocated a value from 1 to 3. 20 people were asked at each location. For every question, the number of times each answer was given is multiplied by the value of the answer, giving each question a score out of a possible 60 (If all 20 interviewees gave the answer worth 3 points). The total score for an area is the sum of all 8 question scores (out of a total of 480 points). The higher the total score, the more sustainable the area is. Figure 3.22 (below) displays each answer and its value.

Question	Answer	Value
1	A	3
	B	2
	C	1
2	A	3
	B	2
	C	1
3	A	3
	B	1
	C	2
4	1	1
	2	1.5
	3	2
	4	2.5
	5	3
5	1	1
	2	1.5
	3	2
	4	2.5
	5	3
6	1	1
	2	2
	3	3
7	1	1
	2	2
	3	3
8	A	1
	B	2
	C	3

Figure 3.26

Using the table on the previous page, a total score is attained by adding up the scores from each of the nine areas. The smaller pie chart represents the score obtained (in blue) by adding all scores from each area together. The red area of the smaller pie chart indicates the fraction of the total available score which was not obtained. The large pie chart breaks down the blue sector of the smaller pie chart, displaying the different scores obtained from each area investigated.

KT

Total Score Obtained on Questionnaire

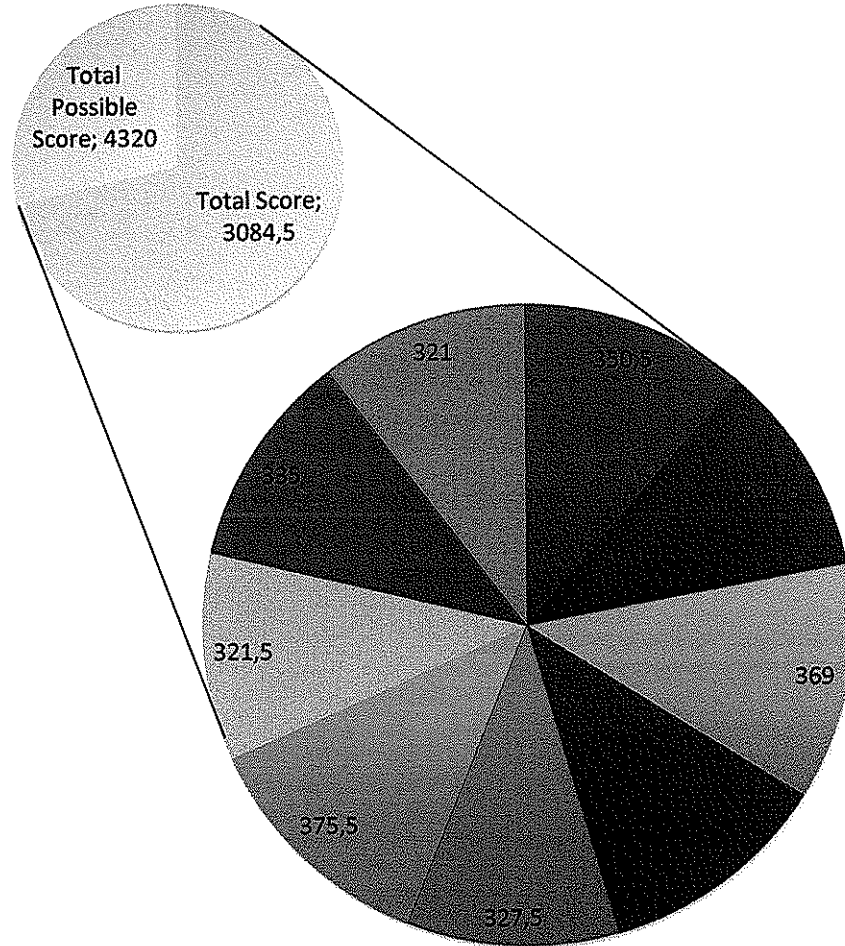


Figure 3.23

Key

Location	Colour
Altona - Blankenese	
Altona - Königstrasse	
Eimsbüttel - Hoheluftbrücke	
Nord - Alsterdorf	
Wandsbek - Ritterstrasse	
Mitte - Jungfernstieg	
Mitte - Legienstrasse	
Bergedorf - Nettelburg	
Harburg - Neugraben	

KN

Analysis and Interpretation of Data

Hypothesis

“According to the ‘Egan Wheel’, Hamburg is a sustainable city”

In order to accept or reject this hypothesis, surveys were done around the city of Hamburg, each representing different ‘sectors’ of the Egan Wheel:

<i>Factor of a Sustainable Community</i>	<i>Method of Data collection</i>
Transport and connectivity	- Questionnaire,
Services	- Questionnaire - Amenity Index
Environment	- Bi-Polar Landscape Evaluation Survey - Bi-Polar Environmental Quality Survey - Car and Pedestrian Count
Economy	- House Quality Index - Car and Pedestrian Count - Questionnaire
Housing and the Built Environment	- House Quality Index
Social and Cultural	- Car and Pedestrian Count - Shopping Environment Evaluation Survey - Amenity Index - Questionnaire

As shown in the table above, the different surveys allow for certain aspects of sustainability (adapted from the Egan Wheel) to be analysed. In order for a city, in this case Hamburg, to be classified as sustainable, it must score highly in each of the separate categories.

Figures 3.5 to 3.13 on page 16 illustrate the total score each area achieved in 6 of the surveys (excluding the questionnaire). It is evident that most areas follow a similar pattern, shown in the template graph below.

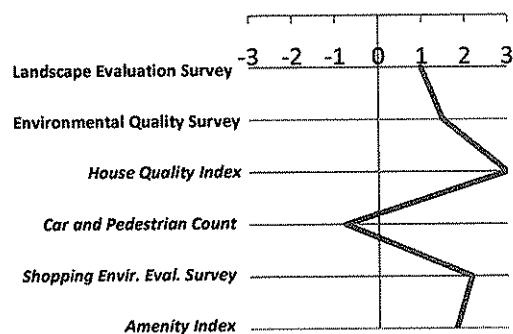


Figure 4.1

This template, taken from the results collected at Hoheluftbrücke, Eimsbüttel, illustrates how in most cases, areas scored positively in all surveys (excluding the questionnaire), especially in ‘House Quality Index’, however rather poorly in ‘Car and Pedestrian Count’. Figure 3.10, Jungfernstieg, Mitte, is the exception to this pattern, scoring highly on every survey.

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To further utilise the data collected in gaining a more general assessment of Hamburg's level of sustainability, averages were taken from the totals of each of the surveys (excluding the questionnaire). The average totals are displayed on figure 3.15 on page 17. This again confirms the common pattern shown on the previous page.

To understand Hamburg's level of sustainability, it is necessary to look at the results collected for each factor of the Egan Wheel.

Transport and Connectivity

With reference to question 7 of the questionnaire ("For this area, on a scale from 1-3, 3 being the best, rate: Accessibility") Hamburg's connectivity, communications and public transport services can be assessed. With 89% of interviewees rating this factor 2 or 3 out of 3 (figure 3.24, p.19), Hamburg proves Hamburg to be successful in this field of social sustainability.

The Hamburg Transport Authority (HVV) operates a train network of 298 km and 1850 km bus network. All train lines, including a newly constructed line connecting the "Hafen-city"¹ to the central business district, run through Hamburg Central Station. On the 12th of December 2008 a new train line opened, connecting the city of Hamburg to the Hamburg Airport. The bus network operates as frequently as every 2 minutes on busy routes and 30 minutes in suburban areas. Hamburg has recently implemented several hydrogen buses in attempt to reduce fuel emissions. Trains often run every 5 to 10 minutes throughout the city. There are 2465 bridges in Hamburg crossing the river Elbe. Hamburg has an international airport and one of the most important container ports of the world. There are 6 transit ferry lines along the Elbe, which is mainly used by Hamburg citizens and airbus² workers. They also offer opportunity for sightseeing tours at the price of a standard HVV public transport ticket (2.50€).³ Internet and phone lines are available to all regardless of their location within Hamburg, at rates affordable to most. The postal service (DHL) is active 6 days a week, delivering post and packages in under 2 two days.

Services

This factor of the Egan wheel can be evaluated with regard to question 2, 3 and 4 of the questionnaire ("How far do you travel to go shopping?", "Are you satisfied with the services provided in this area?", "For this area, on a scale from 1-5, 5 being the best, rate: Entertainment"). Here, insight is offered into the development and availability of services and amenities in the city of Hamburg. The responses to question two were fairly equally distributed, with a slight majority answering with "1-2km" (37%). This indicates that in some areas of Hamburg, shops and retailers are perhaps less abundant than in others, and people have to travel further. However as suggested by the results from question 3 and 4 (82% of interviewees were satisfied with the services provided in their area, (44% were of the opinion that improvements could be made), and 65% rating the level of entertainment in the area between 3 and 4), service availability and the diversity of amenities is reasonably well developed in Hamburg.

* opinion of respondents is not necessarily proof.

¹ An area of Hamburg built on the River Elbe – a good example of interior renovation of early 19th century buildings, keeping the outside of the buildings as originally constructed.

² One of Airbus' main assembly lines is located on the south side of the Elbe

³ www.hamburg.de , 21/9/2008

KSS

The amenity index is a simple arithmetic sum of the number of available amenities seen in an area (with a maximum of 30 different amenities). The results from the amenity index survey showed to be rather positive: seven out of nine areas accounted for over 20 of the 30 possible amenities. The average however is brought down by Königstrasse, Altona and Nord, Alsterdorf, where only 11 and 13 amenities were accounted for respectively (data shown on figure 3.2, page 15).

The average from all nine areas on a unit scale from -3 to 3, displayed on figure 3.15 on page 17, is just over 1 unit. This average, taken as a general representation of Hamburg, indicates a positive availability of amenities spread out through each district of Hamburg.

There is a vast availability of services in Hamburg, including a reliable public transport system as previously mentioned, and convenience shops at almost every train station open most hours of the day. There are 54 hospitals spread throughout the city of Hamburg available to all⁴. Hamburg has also established a welfare service for the less privileged called "Hartz Vier". As shown by the data and general information, Hamburg justifiably scores positively in this sector of the Egan Wheel, as a factor of sustainability.

Acceptable - But Hamburg is dealt with in isolation

Environment

The 'Bi-Polar Landscape Evaluation Survey' is used to evaluate the environment, taking into account various factors such as olfaction, aesthetics, hygiene and cleanliness as well as management.

The total scores for this particular survey varied from -6 out of 30 in Ritterstrasse, Wandsbek, to 20 out of 30 in Jungfernstieg, Mitte (this raw data is shown in the figure 3.2 on page 15). This margin of disparity is seemingly vast, however it is evident that the majority on the areas scored 10 or above out of 30 (5 out of the 9 areas). In general, positive scores were obtained in this survey, with the exception of Ritterstrasse, Wandsbek, and Königstrasse, Altona.

The average total score for bi-polar landscape evaluation survey was roughly 1 unit (on the unit scale from -3 to 3) or approximately 10 points on the original score system from -30 to 30 (this is scene on figure 3.15 on page 17). This average takes the sample data and attempts to create a generalized picture of Hamburg's achievement in this survey.

The 'Bi-Polar Environmental Quality Survey' again evaluates the quality of the environment, taking into consideration mainly the human impacts such as littering, graffiti, vandalism and the amount and quality of preserved vegetation and greenery.

On a scale from -30 to 30, all areas achieved a positive rating, varying from 1 in Königstrasse, Altona, to 22 in Jungfernstieg, Mitte (figure 3.2 on page 15). The average score on the unit scale from -3 to 3 (just above 1 unit), indicates a generally high level of environmental quality. Evidently there is little graffiti in Hamburg, and effort is put into keeping the environment neat and clean.

Question 1 of the questionnaire ("How many cars do you own?") figure 3.18 (page 19) indicates 62% of the people interviewed to have responded with "1-2". This indicates that on average, Hamburg has an environmentally unfriendly amount of carbon dioxide emission per person. The results from the car and pedestrian too suggest an oversized car population compared to the human population. In most areas with the exception of Jungfernstieg (an upmarket shopping district), Legienstrasse and Bergedorf (both suburbs with few inhabitants), there were roughly two times the number of cars that people (adopted from data in figure 3.2, page 15).

⁴ <http://en.wikipedia.org/wiki/Hamburg#Economy> , 21/12/2008, 14:02

KS

Large SUVs and powerful sports cars with high fuel consumption rates are still widely popular in the city of Hamburg (based on observations while carrying out fieldwork investigation), suggesting this to be an area of environmental sustainability that requires more attention. *Assumption - no evidence*

On answering question 5 of the questionnaire ("For this area, on a scale from 1-5, 5 being the best, rate: How well kept the environment is"), 69% of interviewees rated the management of the environment of their area 3 to 4 (figure 3.22, page 19).

The reuse of resources is a vital aspect of sustainability and environmental preservation. Question 8 of the questionnaire ("How often do you recycle") addresses this factor. 81% of the interviewees claim to be actively recycling, proving Hamburg to be sustainable in terms of resource use and reuse (figure 3.25, page 19). *better to say "supporting the concept of sustainability"*

12% of Hamburg's city surface is parks, recreation areas and woods. 8% of the city is covered with lakes, rivers and other water areas. There is 46 km² of national park and a further 170 km² of protected nature reserves. There are roughly 215000 trees lining the streets of Hamburg. The majority of construction in Hamburg is considerate of the environment and reduces the environmental impact to a minimal. There are strict rules in Hamburg, restricting the removal of trees and the obstruction of ecosystems.⁵

Based on both primary and secondary data, Hamburg successfully manages its environment sustainably, with the exception of fuel emissions.

Housing and the Built Environment

The 'House Quality Index' evaluates the quality of buildings on a scale from -16 to 16, taking into account various aspects of construction such as roofing, quality of brick, paint and structure and the level of upkeep as a factor of the Egan Wheel.

In eight out of nine areas, with the exception of Ritterstrasse, Wandsbek, the house quality index produced extremely positive results, and was often the survey with the highest unit value (seen on figures 3.2 to 3.10 on page 18). This indicates an extremely high quality of building throughout Hamburg. Predictably, the house quality index scored the highest average on the unit scale from -3 to 3, seen on figure 3.15 on page 17 (just below 3) out of the 6 surveys (excluding the questionnaire).

The quality of housing and buildings in Hamburg is generally very high due to post World War Two regeneration. Many buildings have been renovated, yet keeping the traditional Hamburg-style architecture. Effort is made to sustain high quality housing and construction, however perhaps more so in some districts than others. The centre of Hamburg is undergoing constant improvement whereas east Hamburg is slightly more neglected with regard to the upkeep of housing and the built environment.

Economy

As previously analysed, the 'House Quality Index' is a relevant survey in assessing the economy of Hamburg as a necessary attribute to a sustainable community. With high building quality in almost every area investigated, the 'House Quality Index' suggests a high economic base in Hamburg

Question 1 of the questionnaire ("How many cars do you own?") can also be used to offer insight into Hamburg's economic situation. Figure 3.18, page 19, indicates 62% of the people

⁵ www.tanimola.de/engl/statist.htm , 25/12/2008, 15:02

interviewed to have responded with "1-2". Evidently Hamburg is a wealthy city with a low unemployment rate and a successful business-based economy.

The 'Car and Pedestrian Count', too indicates a highly developed economic base, with a large traffic flow in most areas (interpreted from the data in figure 3.2, page 15). As this is also possible in less economically developed cities such as Bangkok or New Delhi, it is noteworthy that the observed cars were often of high market value (Mercedes, Porsche, BMW, Audi ... etc).

The Hamburg Harbour transhipped 134 million tons of goods in 2007 and is one of world's largest exporting cities. Airbus has an assembly line in Hamburg which employs roughly 57,000 people.' Der Spiegel' and 'Die Zeit' along side with roughly half of Germany's national newspapers and magazines are produced in Hamburg. Music companies such as Warner Bros. Records Germany and Internet businesses such as AOL, Adobe Systems and Google Germany are also based in Hamburg. Hamburg is a producer of steel and aluminium as well as being Europe's largest copper producer. These all provide thousands of jobs in Hamburg and help to maintain a sustainable economy. In Hamburg, there are now 27,000 more available jobs than in 2007. The unemployment rate in Hamburg is 8.2% (May, 2008), in comparison to 9.3% in 2007.⁶ Hamburg's gross domestic product (GDP) reached roughly €89 billion in 2008 and has the highest GDP per capita in Germany (€50,000). There are currently 120,000 organisations based in Hamburg and this number is continuously growing⁷

Cultural and Social

The 'Shopping Environment Evaluation Survey' evaluates Hamburg's shopping environment as an aspect of this section of the Egan Wheel ('Cultural and Social'). The results for this survey are rather diverse and vary throughout each area of study from 17 in Legienstrasse, Mitte, to 47 in Jungfernstieg, Mitte⁸ (displayed in figure 3.2, page 15).

The average for all totals seen on figure 3.15 on page 17 (approximately 0.5 units, on a scale from -3 to 3), indicates a varied landscape with regard to shopping environment (with areas scoring low on the survey and areas scoring high, giving an average near the middle of the unit scale).

Question 6 of the questionnaire ("For this area, on a scale from 1-3, 3 being the best, rate: How safe you feel") allows for an analysis of equity, cultural and social conflict, and the effects of law enforcement in Hamburg. 88% rated their area 2 or above (figure 3.23), indicating a reasonable level of safety and cultural balance⁹ throughout the city of Hamburg. Furthermore question 4 ("For this area, on a scale from 1-5, 5 being the best, rate: Entertainment") can also be used in assessing Hamburg's culture. With 65% of interviewees rating the level of entertainment in the area between 3 and 4, Hamburg has a justifiably thriving cultural and social community.

Hamburg has a State Opera and two state theatres, furthermore about 30 private theatres and 82 cinemas. There is a planetarium, seven municipal museums and another 40 private museums. The "Hamburg public library" includes 41 district libraries, 3 mobile libraries and 5 special libraries. An amusement park called the "Hamburger Dom" suitable for all age groups and all social classes runs three

⁶ <http://www.tanimola.de/engl/statist.htm> , 25/12/2008, 15:29

⁷ <http://en.wikipedia.org/wiki/Hamburg#Economy> , 4/1/2009, 18:15

⁸ The fact that both extremes are found in the same district of Hamburg is simply due to sheer size of the district and the versatile environments found within the district.

⁹ There was a wide diversity in age, sex and cultural background amongst the interviewees, and therefore any evidence of cultural conflict would be apparent in the results of question 6.

times a year. There are 80 weekly markets including the traditional "Fischmarkt" in Altona¹⁰. This high level of free interaction between cultures relieves Hamburg of the possible cultural tension between different ethnicities, and verifies Hamburg's success in meeting this sector of the Egan Wheel.

Governance

The city of Hamburg is currently governed by a democratic party (the 'Christian Democratic Union, CDU) elected on the 24th of February, 2008. Every citizen over the age of 18 has an equal right to vote in Hamburg, regardless of ethnic background or gender. The Hamburg government is constantly thriving to achieve optimum functionality and practicality with regard to road connectivity, public transport and infrastructure, as well as ensuring the satisfaction of its citizens by implementing a wide availability of health care, education, and social activities accessible by all.

opinion



Equity

Hamburg is a free metropolitan community with a vast number of cultural minorities. Despite some zonation between ethnic groups, the level of interaction between cultures stands extremely high and levels of discrimination and cultural persecution, very low. Hamburg ensures everyone acquires the rights they deserve and have implemented a social welfare group called "Hartz IV" which helps to support those less privileged. In Hamburg there is an equal distribution of employment amongst men and women in most fields of work. Equity, as in most MEDC's in the 21st century, has been long established and is no longer a major issue.

Not much evidence for this



The Radar Graph

Figure 3.16 on page 18 is a radar graph displaying again the average score of the accumulated totals of each survey, using a unit scale from -3 to 3. In order for a city to be classified as sustainable, according to the Egan Wheel, it is necessary to equally satisfy several factors (shown on page 3). The radar graph on page 18 clearly demonstrates how the city of Hamburg achieved equally high on each of the surveys. The hypothesis is therefore supported by the data collected from the 6 surveys (excluding the questionnaire). However as seen on the radar graph (figure 3.18, page), most surveys averaged at roughly 1 unit (minimum just below 0 units) on a scale from -3 to 3, meaning there is room for improvement in each field of sustainability (excluding 'House Quality Index', whose average total was just below the maximum of 3 units).

Standard Deviation

Figure 3.17, directly below the radar graph on page 18, is a column graph displaying again the averages of the totals of 6 of the surveys (excluding the questionnaire) along with the standard deviation, unique to each survey. With the exception of 'House Quality Index', the standard deviation displays considerable variation from the mean in the scores of each of the surveys; approximately 2 units (on a scale from -3 to 3) in most cases (up to 3 units in the 'Landscape Evaluation Survey'). These high standard deviations suggest a vast diversity in the tested components of the Egan Wheel (from environmental conditions and upkeep, to land use and human impact), indicating perhaps a lack of equally distributed efforts of sustainability in Hamburg.

¹⁰ <http://www.hamburg.de>, 17/1/2009, 22:50

KCS

The Total Score in the Questionnaire

The total score each area achieved in the questionnaire is calculated using the values for each answer shown in figure 3.26, page 20. Figure 3.27 on page 21 shows by means of a pie chart Hamburg's total score in the questionnaire (3084.5 out of a possible 4320), obtained by summing the totals of each area. Hamburg achieved on average a high level of sustainability with regard to the different factors taken into consideration in the questionnaire, with the exception of the number of cars owned in terms of environmental sustainability.

The distribution (seen in the larger pie chart, figure 3.26) can be deduced by the size of each sector. The pie chart clearly shows an overall even distribution of sustainability throughout the city of Hamburg with regard to the questionnaire. Some areas exceed others in some questions, however score less than them in other questions – average out to be equally sustainable, in terms of different factors

On a whole, both surveys and questionnaire prove Hamburg to be a sustainable city, however in almost every field of investigation, there is room for improvement.



Conclusion and Evaluation

Transport and connectivity

This factor is investigated through question 7 of the questionnaire. A high percentile of interviewees rated the city this factor 2 or 3 out of 3, proving Hamburg to be successful in this sector of the Egan Wheel.

Services

This factor was examined by means of the 'amenity index', 'shopping environment evaluation survey' and question 2, 3 and 4 of the questionnaire. With the exception of question 2, all evidently satisfied the criteria for this factor, with the exception of question 2.

Environment

Environment was tested by several surveys listed and with the exception of the 'car and pedestrian count' the average score on the unit scale showed Hamburg's environment to meet the standards of the Egan Wheel.

Economy

Insight into Hamburg's economy is given through several surveys all proving Hamburg to have a sound economic core. However it must be noted that wealth is perhaps not entirely evenly distributed, with some areas such as Legienstrasse not as economically strong as others such as Blankenese or Jungfernstieg.

Housing and the Built Environment

Evaluated by the 'house quality index', Hamburg's housing and built environment is well developed and kept.

Social and Culture

This factor is assessed using the 'amenity index' and 'shopping environment evaluation survey' as well as the questionnaire. In all three cases, positive results were attained demonstrating a high level of social and cultural integration.

<i>Factor of a Sustainable Community</i>	<i>According to primary data, how successful Hamburg is in each category</i>
Transport and connectivity	Approved
Services	- Question 2 of the questionnaire failed to support this factor
Environment	- The amount of CO ² emissions implied by 'Car and Pedestrian Count', hinders Hamburg's level of environmental sustainability
Economy	Approved
Housing and the Built Environment	Approved
Social and Cultural	Approved

→ only implied

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Hypothesis:

"According to the 'Egan Wheel', Hamburg is a sustainable city"

Based on the table on the previous page, the conclusions of each component of the Egan Wheel investigated, and the secondary data (discussed in Data Analysis) accounting for the other factors of the Egan Wheel that were not investigated (Governance and Equity), this hypothesis can be **ACCEPTED** ✓

Evaluation

The conclusion of this investigation is based on the averages of each of the different surveys. This does not take into account the possibility of unequal distribution of sustainability. Sustainability in Hamburg is in fact concentrated in some areas such as Jungfernstieg, which scored highly in each survey. Areas such as Ritterstrasse fall below the average on some surveys (house quality index for example), demonstrating the unbalanced level sustainability across the city of Hamburg. To disregard this limitation of the data, it would be necessary to carry out further extensive fieldwork investigation across the city of Hamburg.

The questionnaire used in this investigation was ^{limited} omitted to 180 people due to time restrictions. With in mind that the population of Hamburg is 1.8 million, it is clear 180 people is not an appropriate sample size. In order to obtain a more realistic understanding of the views of the general population, a far larger sample size is required. The time constraint on the questionnaire also limited the number of questions (eight questions). Evaluating a cities level of sustainability is in actual fact a rather complex procedure, and had there been less pressure on time, additional questions could have been used in the effort to assess every factor of sustainability (adapted from the Egan Wheel, page 2).

The majority of the surveys, with the exception of the car and pedestrian count, were qualitative measures, based on perception. All surveys were done by one individual, and so biased opinions cannot be identified. This investigation could be further developed by having several individuals take part in the surveys.

All fieldwork took place in the summer of 2008 and therefore disregarding any possible seasonal changes (such as street and pedestrian traffic) as well as resulting in possible biases such as with greenery and vegetation in environmental surveys. To enhance the study, data could be collected throughout the year in each of the different seasons. ✓

The cities ecological footprint would have contributed to this study tremendously, however the calculation itself is reasonably extensive and due to time restrictions and lack of secondary data, it could not be calculated. It would however be a justified improvement to this study.

There are a vast amount of definitions and models of sustainability; one of which this investigation is based on. It must be noted that evaluating Hamburg's level of sustainability is limited here by the 'Egan Wheel' model.

Sustainability can only truly be measure accurately of a period of several years. This investigation evaluated the city of Hamburg on its current state, however to understand the level of sustainability of a given area, it is necessary to take into account the possible social, political, economic, environmental and demographic changes over time. ✓

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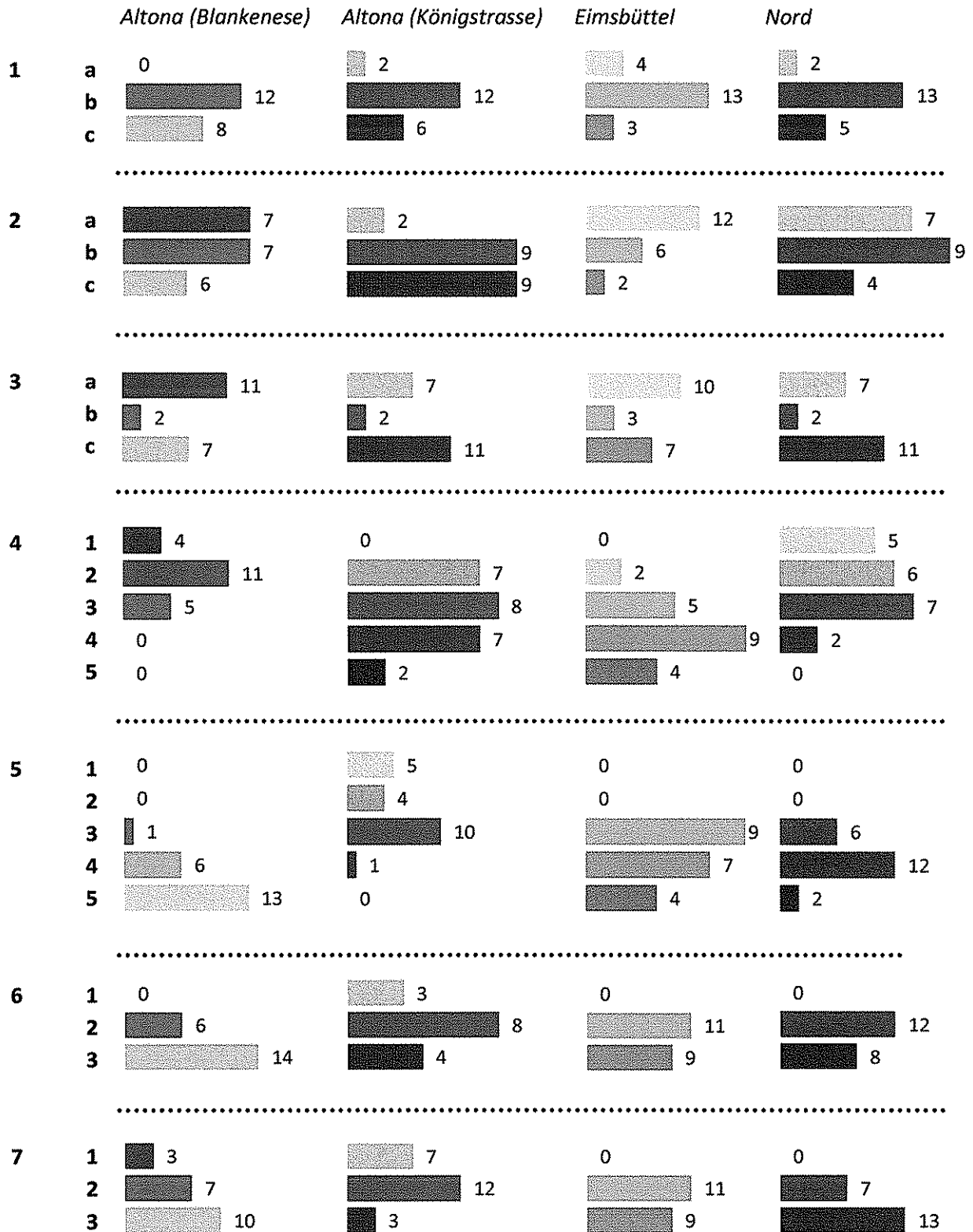
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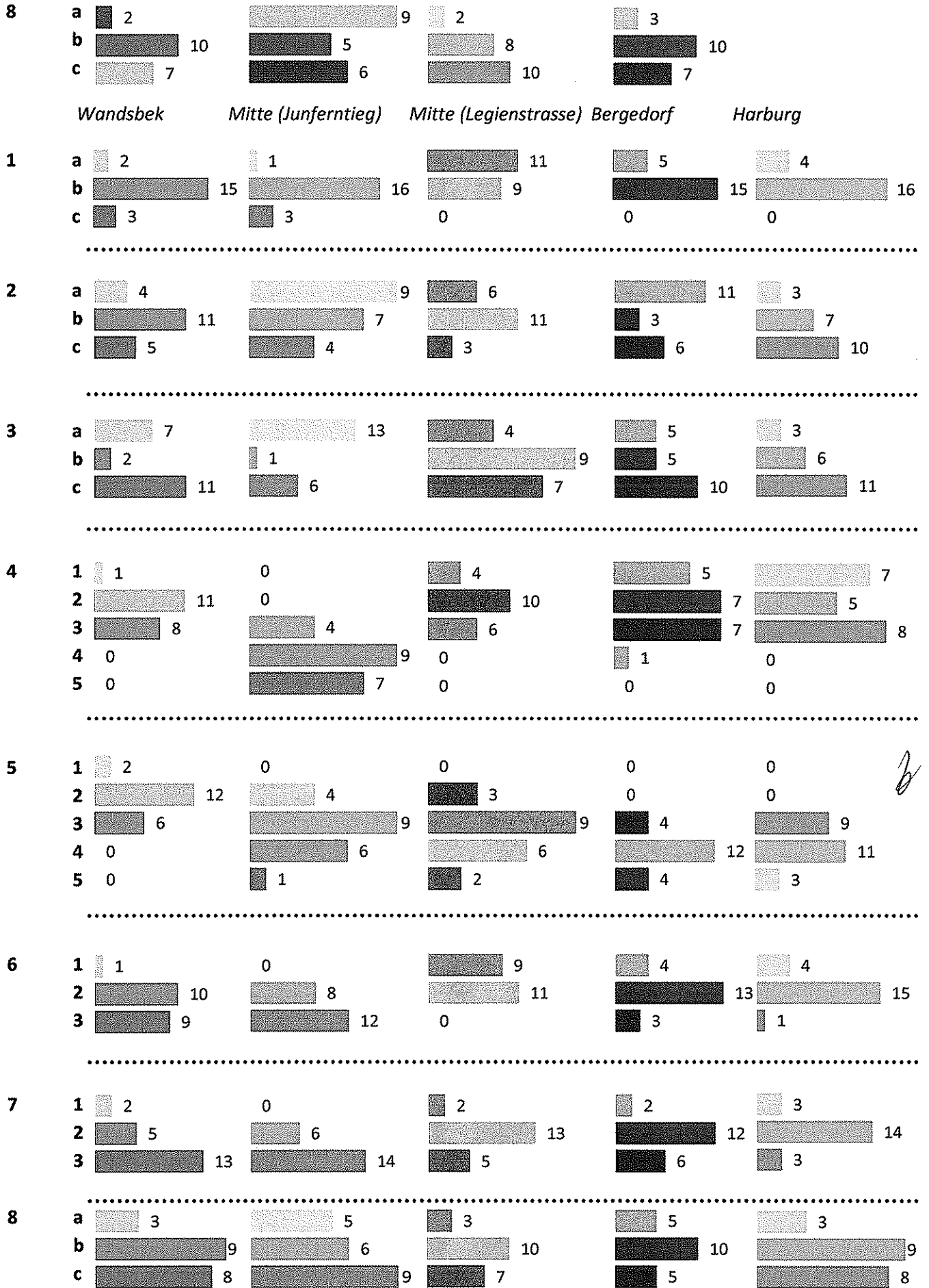
Appendix I

The tables below indicate the distribution of answers per question in each of the nine areas. (The number to the left of each bar, is the number of people who responded with that particular answer (out of 20¹).



¹ 20 people were given the questionnaire in each area.



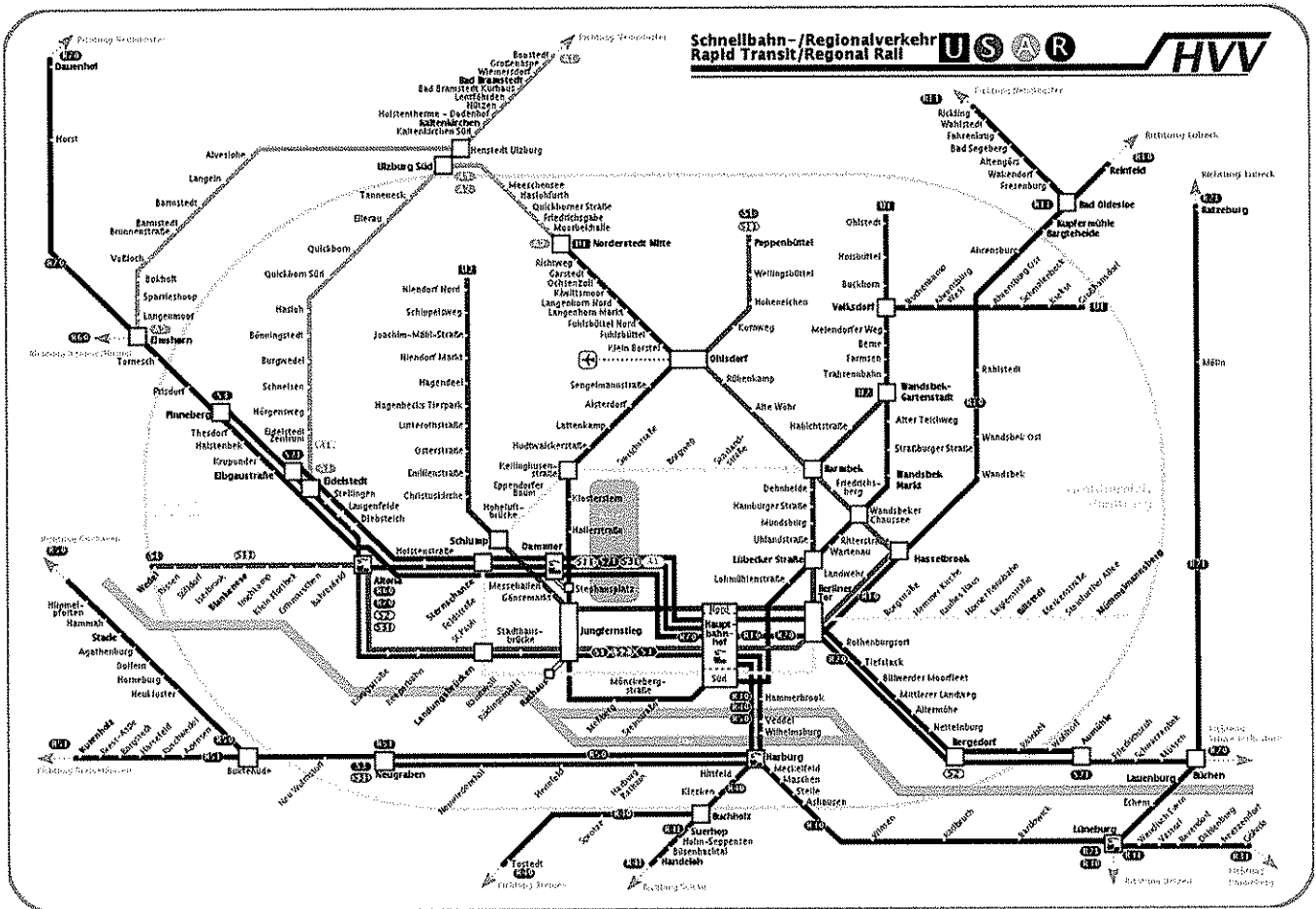


Appendix II

- Random Number Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	8	0	9	4	2	5	2	5	8	2	4	7	1	3	4	7	7	4	3	3	3	6	2	0	1	8	9	7	2	1	3	4
2	3	5	6	3	2	1	9	8	8	2	1	1	9	0	4	5	2	6	1	8	2	7	5	1	2	6	2	7	1	0	9	5
3	1	3	3	0	6	3	3	1	3	7	5	3	9	6	9	3	8	7	3	8	6	8	1	5	1	5	3	8	8	5	4	3
4	3	5	6	5	0	0	1	6	2	2	4	3	6	4	3	2	4	7	9	6	6	0	9	5	5	2	8	3	1	6	2	0
5	7	8	5	0	5	9	2	5	5	5	8	8	7	3	1	1	2	1	9	2	4	5	4	5	3	5	3	0	5	5	8	9
6	4	4	9	0	5	4	1	7	9	7	2	7	6	1	5	3	5	9	0	1	4	8	7	8	4	9	8	0	9	8	7	7
7	6	5	4	5	9	1	0	4	9	3	1	8	8	8	1	9	7	5	3	7	2	7	8	5	9	3	7	3	2	4	4	5
8	3	6	2	8	5	9	9	5	1	2	1	5	9	7	5	3	9	2	2	3	5	6	5	8	2	9	4	4	2	8	9	9
9	4	6	6	5	4	8	2	0	7	5	5	4	0	6	1	2	9	6	8	3	4	2	5	1	9	1	3	8	1	7	0	9
10	6	4	9	8	7	5	1	9	0	4	7	4	7	8	1	8	6	8	3	2	9	6	8	3	9	8	7	2	4	0	9	0
11	6	7	2	2	9	8	6	9	9	3	6	1	7	8	7	5	4	8	8	3	1	3	1	5	9	6	7	9	8	8	3	4
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15	8	2	7	9	3	0	1	9	4	6	7	2	3	7	4	3	3	9	7	9	4	6	8	9	9	0	2	1	6	9	9	0
16	0	1	6	1	7	6	1	7	1	0	2	4	2	3	8	7	2	8	9	1	6	6	7	7	6	7	5	8	2	4	8	2
17	7	3	8	8	9	7	5	9	7	5	5	5	6	6	2	4	9	9	7	7	2	0	0	8	1	5	8	5	9	7	4	0
18	7	8	3	0	4	7	1	4	3	6	9	5	2	9	1	9	1	8	0	4	4	0	4	4	1	0	3	4	2	5	9	7
19	9	8	8	7	4	2	1	6	6	5	2	6	4	5	3	5	8	4	3	0	5	2	7	0	9	6	0	5	0	7	6	8
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22	4	5	5	0	8	1	0	3	1	2	5	0	2	3	0	4	1	1	3	8	9	7	8	8	9	1	4	4	4	5	2	6
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24	8	9	7	6	5	8	2	3	8	4	8	7	0	4	5	0	3	1	0	6	9	1	6	6	2	7	1	7	7	6	0	1
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30	4	6	1	3	8	5	4	9	6	3	6	9	3	2	0	8	5	1	0	9	9	6	8	0	1	1	6	8	6	1	3	3

Appendix III
- Train Network in Hamburg



Appendix IV

- Questionnaire in German

1. Wie viele autos besitzen sie?
 - a. 0
 - b. 1-2
 - c. 3+

2. Wie weit müssen sie zum einkaufen fahren/laufen?
 - a. <1km
 - b. 1-2km
 - c. 3 km +

3. Sind sie mit den dienstleistungen in dieser gegend zufrieden?
 - a. Ja
 - b. Nein
 - c. Ja, aber mann könnte sie verbessern

4. Bewerten sie den freizeitwert dieser gegend von einer skala von 1-5, (1= Schlecht, 5=Sehr Gut)

5. Bewerten sie den zustand der umwelt in dieser gegend von einer skala von 1-5, (1= Schlecht, 5=Sehr Gut)

6. Wie sicher fühlen sie sich in dieser umgebung? 1-3 (1= Unsicher, 3=sehr sicher)

7. Wie sind die transport möglichkeiten in dieser gegend 1-3 (1=schlecht, 3 = sehr gut)

8. Wie oft recyceln sie? (flashen, alte möbel...etc)
 - a. Nie
 - b. Einmal im monat
 - c. Einmal die Woche

2

Assessment form (for examiner use only)

Candidate session number	0	0	
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Assessment criteria	Achievement level	Achievement level	
		First examiner	Second examiner
<i>Just ambitions</i> A research question	2 ✓	2	2 ✓
B introduction	2 ✓	2	2 ✓
C investigation	4 ✓	4	4 ✓
D knowledge and understanding	3 ✓	4	3 ✓
E reasoned argument	3 ✓	4	3 ✓
F analysis and evaluation	3 ✓	4	4 ✓
G use of subject language	4 ✓	4	4 ✓
H conclusion	2 ✓	2	2 ✓
I formal presentation	3 ✓	4	3 ✓
J abstract	2 ✓	2	2 ✓
K holistic judgment	4 ✓	4	4 ✓
Total out of 36		32 ✓	33 ✓

*If would have been preferable to
introduce results (graphs etc) with
analysis rather than discuss them so
completely in the organization paragraph.
Lots of data but perhaps only ambitions and
fails to avoid discussion of meaning & all
these findings in the bigger picture of sustainability.*

Name of first examiner: _____
(CAPITAL letters)

Examiner number: _____

Name of second examiner: _____
(CAPITAL letters)

Examiner number: _____