



NEIGHBOURHOOD LIVEABILITY IN BELFAST, NORTHERN IRELAND, UNITED KINGDOM

A case study into the difference in (perceived) liveability between Protestant and Catholic neighbourhoods

Kevin Vedder

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drs. P.J.M. van Steen

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PREFACE

In front of you lies the thesis 'Neighbourhood liveability in Belfast, Northern Ireland, United Kingdom'. The research of this thesis into neighbourhood liveability has been performed in two neighbourhoods of Belfast, one being a Catholic neighbourhood (Andersonstown) and one being a Protestant neighbourhood (Woodvale). This thesis has been written in the context of my bachelorproject of the study Spatial Planning and Design at the University of Groningen. From September 2019 up to and including January 2020 I have been concerned with doing research and the writing of my thesis, both in Belfast and in Groningen.

Together with my supervisor, P.J.M. van Steen, I composed the research question of my thesis. After thoroughly doing research, I was able to draw up conclusions to my research question. During this process, I got guidance from both my supervisor, P.J.M. van Steen as from my supervisor in Belfast, D. Adlakha.

I therefore want to thank both for guiding me throughout the process of my thesis, which has been very helpful. Besides that, I also want to thank K. Feeney from the Woodvale Community Centre and P. Deighan for their help in distributing the surveys for respectively Woodvale and Andersonstown. Without their help it would have been very hard to retrieve enough respondents on the survey.

I wish you much pleasure reading my thesis!

Kevin Vedder

Groningen, January 17th, 2020

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SUMMARY

Liveability is an often-used term in the development of cities and other areas. However, researches on the topic of liveability mostly stick to researches between cities, regions or countries, but not within cities or between population groups. In the light of the former Troubles in Northern Ireland and the related, still present, spatial division of Catholics and Protestants in Northern Ireland, specifically Belfast, this research aims to find out whether there is a difference in (perceived) liveability between (formerly) Catholic and Protestant neighbourhoods. Therefore, this research intends to: (1) conceptualise how liveability at the neighbourhood level can best be measured; (2) identify how liveability is perceived in predominantly Catholic and predominantly Protestant neighbourhoods; (3) depict how perceived liveability is related to the spatial environment; and (4) identify how objective indicators influence liveability. Results are acquired by conducting surveys, retrieving secondary data and doing GIS-analyses, based on different indicators of liveability. Indicators are divided in eleven policy areas, for which the comparison between the Catholic neighbourhood, Andersonstown, and the Protestant neighbourhood, Woodvale, will be made. Results show that there is no substantially large difference between perceived and actual liveability within a neighbourhood. However, there are differences in actual and perceived liveability between both neighbourhoods. Overall, liveability is perceived better in Andersonstown, whereas in many cases the actual liveability is better in Woodvale. Concludingly, it can be said that in this case the Catholic neighbourhood (Andersonstown) has a better perceived liveability, while the Protestant neighbourhood (Woodvale) has a better actual liveability, so there is a difference between both neighbourhoods on both aspects. However, because this cannot be generalized to all Catholic and Protestant neighbourhoods, it is unsure whether this difference will also apply in general.

1. INTRODUCTION

1.1 BACKGROUND

In the last decades the total population of people all around the world living in cities is incredibly increasing, and this process of urbanization will be an ongoing process in the next decades. A research by the United Nations on world populations shows that from 2018 until 2050, the world urbanization level will grow from 55 to 68 percent. Their report also states that urban growth can only be successfully managed in case of sustainable development (United Nations, 2018). Yuen & Ooi (2010) agree on this stance and state that world cities increasingly see the importance of liveability and quality of life. The authors even show the importance of liveability with the statement that every city must have liveability as (one of) its central objective(s). Other articles agree with the importance of liveability and thereby liveable communities in the light of the current-day urbanization (Howley et al., 2009; Valcárcel-Aguiar & Murias, 2018).

Several researches have shown that stability is one of the most important indicators of liveability (EIU, 2019 & Lowe et al., 2015). Internationally, there currently are a lot of regions, where it is unsafe due to a high amount of crime, terror, or conflicts. These are unstable areas. When you compare the ten least liveable cities of the most recent Global Liveability Ranking (EIU, 2019), with the then most liveable cities of the same ranking (see *Figure 1&2*), it is clearly evident that the list of the ten least liveable cities contain several cities which are located in either an area of conflict or in an area with a substantially high amount of crime and/or terror, while this does not account for the ten most liveable cities.

Country	City	Rank	Overall Rating (100=ideal)	Stability
Austria	Vienna	1	99.1	100
Australia	Melbourne	2	98.4	95
Australia	Sydney	3	98.1	95
Japan	Osaka	4	97.7	100
Canada	Calgary	5	97.5	100
Canada	Vancouver	6	97.3	95
Canada	Toronto	7	97.2	100
Japan	Tokyo	7	97.2	100
Denmark	Copenhagen	9	96.8	95
Australia	Adelaide	10	96.6	95

Figure 1: The ten most liveable cities (EIU, 2019).

Country	City	Rank	Overall Rating (100=ideal)	Stability
Venezuela	Caracas	131	46.9	35
Algeria	Algiers	132	44.1	50
Cameroon	Douala	133	44	60
Zimbabwe	Harare	134	42.6	40
PNG	Port Moresby	135	41	30
Pakistan	Karachi	136	40.9	20
Libya	Tripoli	137	40.4	35
Bangladesh	Dhaka	138	39.2	55
Nigeria	Lagos	139	38.5	20
Syria	Damascus	140	30.7	20

Figure 2: The ten least liveable cities (EIU, 2019).

One of the most recent cases of a European city located in an unstable area, is Belfast. Located on the island of Ireland, while being part of the United Kingdom, Northern Ireland, and specifically Belfast was the main stage of a period of terror, called the Troubles. Key to this conflict was that the one party, the Irish nationalists, who are mainly Catholics, wanted to have Northern Ireland to become part of the Republic of Ireland, while the other party, the unionists, who are mainly Protestants, wanted to remain part of the United Kingdom. A substantially large problem in this conflict was that throughout the whole of Northern Ireland Protestants and Catholics lived next to each other in the same area, while still separated from each other, which was clearest visible in Belfast, where predominantly Protestant neighbourhoods were located right next to predominantly Catholic neighbourhoods, as can be seen in *Figure 3*. In April 1998, this period of war came to an end, when the Good Friday Agreement was signed, where one of the key phrases was that there should be no hard border

between Northern Ireland and the Republic of Ireland (United Kingdom Government & Republic of Ireland Government, 1998).

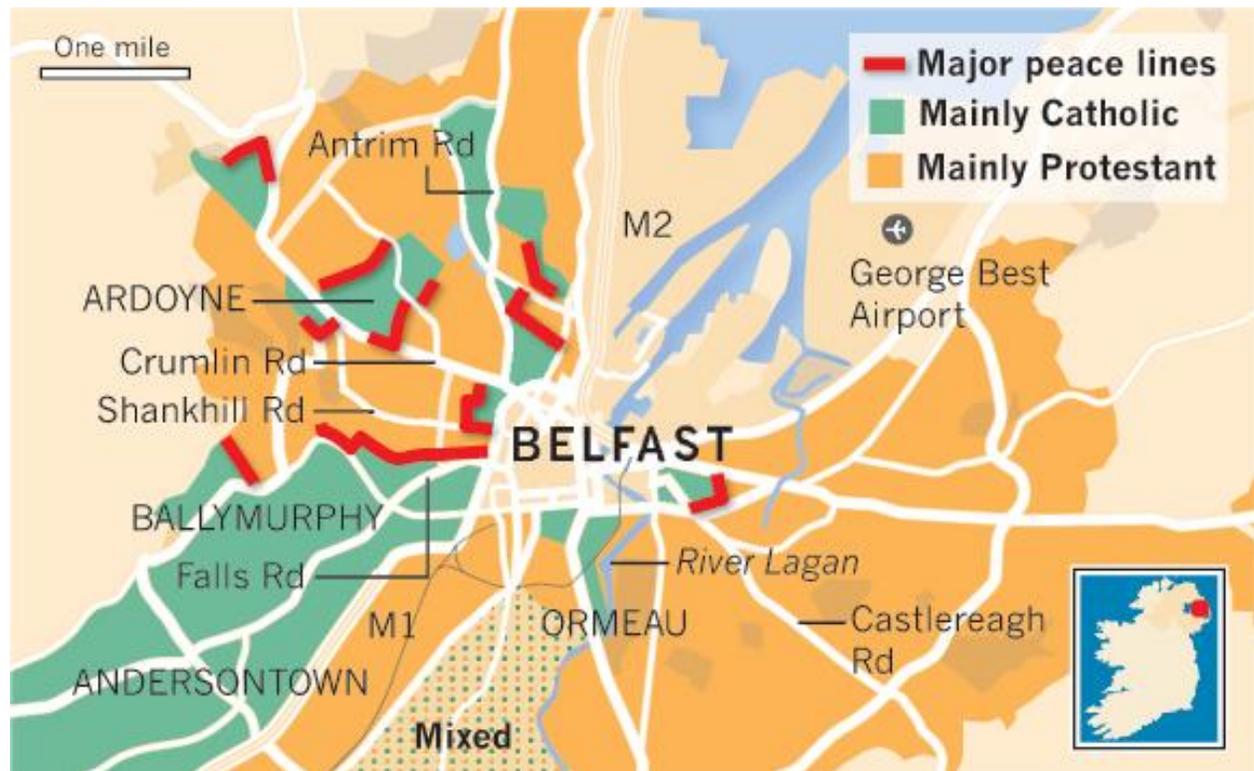


Figure 3: Map of Belfast, Northern Ireland, United Kingdom showing the spatial division of Catholics and Protestants (McKittrick, 2011).

Nowadays, Northern Ireland is awaiting the outcomes of the Brexit process, where the United Kingdom wants to leave the European Union, with all its consequences. The main problem in the process of Brexit is the Good Friday Agreement, which stated, as mentioned before, that there will not be a hard border between Northern Ireland (United Kingdom) and the Republic of Ireland (European Union) (United Kingdom Government & Republic of Ireland Government, 1998). Therefore, it could well be possible that tensions arise again, initiated by problems with the border

Going back to the subject of liveability, Macintyre & Ellaway (2003) state that there already has been constructed a lot of liveability measures for comparisons between cities, while this is substantially less for comparisons within cities.

Using the difference between Protestant neighbourhoods and Catholic neighbourhoods as starting point is very useful, as it is important to not only research the differences between geographic areas (the neighbourhoods), but also between different population groups (the Protestants and the Catholics) (Lowe et al., 2015). Norouzian-Maleki et al. (2018) agree with this as they make a similar statement. The authors state that little research has been conducted yet on the application of different liveability indicators between different cultures. Together with the statement of Macintyre & Ellaway (2003) about the fact that there is a lack in the amount of researches conducted about differences in liveability within cities, it creates the perfect circumstances to conduct a research about the difference in liveability between geographic areas and/or cultures, which can be perfectly applied to Belfast, Northern Ireland.

1.2 RESEARCH PROBLEM

The aim of the research is to find out whether there is a difference in (perceived) liveability between (formerly) Protestant, and (formerly) Catholic neighbourhoods of Belfast, Northern Ireland.

Thus, the central question of this research is: *'Is there a difference in (perceived) liveability between (formerly) Protestant and Catholic neighbourhoods in Belfast, Northern Ireland?'*

Secondary questions that arise out of the central question are:

- 1) How can liveability at the neighbourhood level best be measured?
- 2) How is liveability perceived by inhabitants of one predominantly Protestant neighbourhood and one predominantly Catholic neighbourhood, in Belfast, Northern Ireland?
- 3) How is this perception of liveability linked to the spatial environment?
- 4) In what way do objective indicators influence the liveability of both researched neighbourhoods?

1.3 STRUCTURE OF THE REPORT

The following part of this paper will begin with an overview of the underlying theory upon which this research is based (*Chapter 2*), after which the used research methods will be explained (*Chapter 3*). Successively, the results will be shown, and possible relationships will be highlighted and explained (*Chapter 4*). Finally, a conclusion will be given including a reflection on the results and the methods used (*Chapter 5*).

2. THEORETICAL FRAMEWORK

Multiple researches have been conducted on the topic of liveability. According to Lowe et al. (2015), those researches are conducted while using indicators to measure the liveability of cities or regions. In most researches, indicators are then categorized into different groups. Several types of distinctions are made, of which some examples are: distinction based on environment (economic, social and physical) (Valcárcel-Aguiar & Murias, 2018); distinction based on policy area (crime and safety, transport, housing, employment and income, social cohesion and local democracy, public open space, leisure and culture, health and social services, natural environment, education and food and other local goods) (Lowe et al., 2013, 2015); distinction based on different assets of human settlement (people, lifestyle, community, local economy, activities, built environment, natural environment and global ecosystem) (Barton & Grant, 2006, based on Whitehead & Dahlgren, 1991).

Every year the Economist Intelligence Unit (EIU) publishes their Global Liveability Ranking, with as categories 'Stability', 'Healthcare', 'Culture & Environment', 'Education' and 'Infrastructure'. Each category is then divided in multiple determinants. According to the EIU, the most important categories are 'Stability' and 'Culture & Environment' with both a relative share of 25% on the total Global Liveability Index (EIU, 2019). In the research by Lowe et al. (2015) about liveability indicators, crime and safety topped the charts as the most mentioned policy area in papers about liveability indicators. This is in line with the category of stability of the EIU.

As most of the time liveability is measured using indicators (Lowe et al., 2015), it is useful to choose a distinction for which the indicators will be categorized, as then the results can be compared between each distinctive group. It has been chosen that the focus will be on the distinction in liveability indicators made by Lowe et al. (2013, 2015), as this distinction appeals best to one's imagination and in its study to liveability indicators, they authors have researched more articles about liveability indicators compared to other, similar researches. Also does it make use of both objective and subjective indicators, which is important as the goal of the research is important in the choice whether to use subjective, objective or both types of indicators (Van Kamp et al., 2003). As this research will for a substantially large part be about the perception of liveability, not only objective indicators but also subjective indicators are important, as perception of liveability is a kind of person-environment relationship, and thus requires both indicators (Cummins, 2000).

Since the distinction in policy areas, will be the distinction on which the final comparison between actual and perceived liveability can be based, this will be the main distinction, as can be seen in the conceptual model (*Figure 4*). Subsequently, objective and subjective indicators respectively resemble the research into the actual liveability and the research into the perceived liveability, so this will be the next division of indicators. Finally, a comparison can be made between actual and perceived liveability, based on the previous described distinction. This accounts for both neighbourhoods, for which the results of the previous part can also be compared against each other.

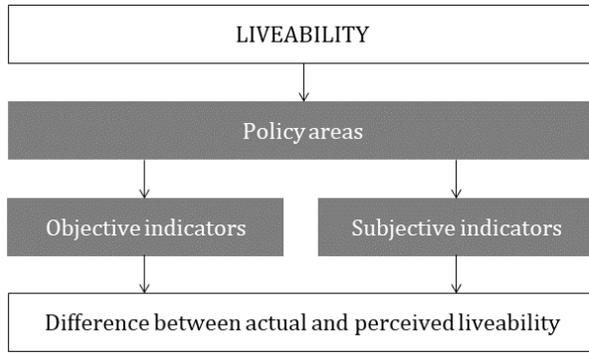


Figure 4: Conceptual model

3. METHODOLOGY

3.1 INTRODUCTION

First, a description will be given of the process of choosing the two neighbourhoods, and which neighbourhoods it are. Second, a list of all indicators that will be used in this research are given, divided among their policy areas. Third, it will be shown how the research will be structured, based on those indicators. Fourth, an explanation will be given on how the data of the research will be used, to come to an outcome.

3.2 CHOICE OF NEIGHBOURHOODS

The focus of this research is to find out the difference in (perceived) liveability between a predominantly Protestant neighbourhood and a predominantly Catholic neighbourhood. Therefore, Andersonstown and Woodvale have been chosen. Woodvale is the neighbourhood of the city of Belfast with the highest relative share of Protestants (86,96%) and the lowest relative share of Catholics (6,02%), according to the 2011 Census. Andersonstown on the other hand, is the neighbourhood of the city of Belfast with the second-highest relative share of Catholics (94,54%) and the second-lowest relative share of Protestants (3,59%), according to the 2011 Census (CONI, 2011). The choice is made not to include the neighbourhood with the highest relative share of Catholics and the lowest relative share of Protestants, as this neighbourhood is located on the outskirts of the city. This neighbourhood, Glen Road, thus comprises partly (semi-)rural areas, and therefore a comparison between Glen Road and Woodvale, would be based on slightly different grounds. Thus, a comparison between Andersonstown and Woodvale would be more justified, as both neighbourhoods are completely classified as urban areas (NISRA, 2005). Important to note is that Glen Road is also classified as urban area, but the choice is made to perform to research to two neighbourhoods that do not differ much in geographical appearance. The location of both neighbourhoods in Belfast can be seen in *Figure 5*.

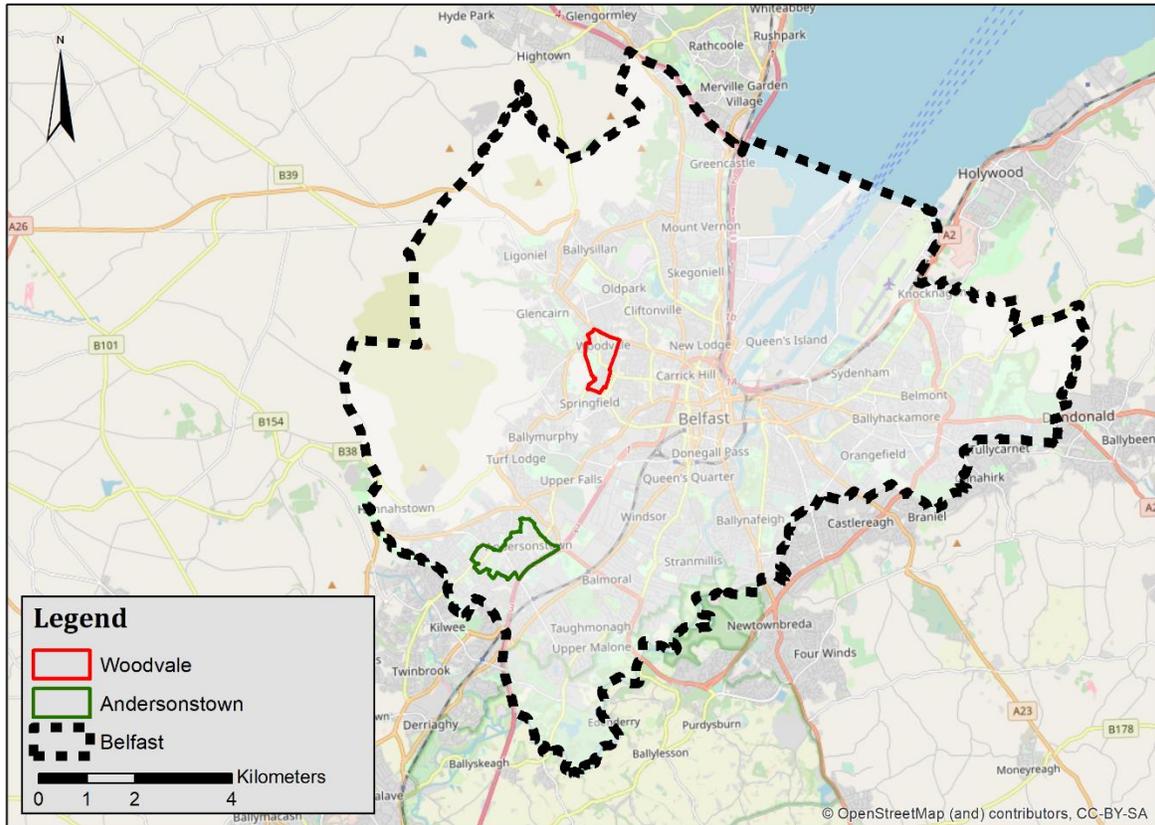


Figure 5: Location of Andersonstown (Catholic) and Woodvale (Protestant), within Belfast, Northern Ireland.

3.3 LIST OF INDICATORS

This paragraph gives an overview of the indicators that will be used throughout the research, divided in their respective policy areas. As previously mentioned, this research will build upon the work of Lowe et al. (2013), as it will use the indicators of their research to conduct surveys in both a Protestant and a Catholic neighbourhood in Belfast, Northern Ireland. Only the indicators that were useful are selected for the surveys. Indicators could be determined as useless because of the following reasons: there are better indicators available; the indicator is not relevant for Belfast; there is no data available for the indicator; the indicator is not useful for the comparison as the data cannot be used for the outcome; there is no reference value available for the data of the neighbourhoods; the reference value takes too much time to get to; or a similar measure is used. Next to it, objective indicators from Lowe et al. (2013) will be used to research the actual liveability of both neighbourhoods. The final list of indicators deduced from Lowe et al. (2013) is listed in *Table 1*. As the complete list of indicators by Lowe et al. (2013) is a very extensive list, it is chosen to not put them in the appendices.

Table 1: List of all indicators used in the research

POLICY AREA	SUBJECTIVE INDICATOR	OBJECTIVE INDICATOR
<i>Crime and safety</i>	Perception of personal safety	Rates of crime against the person
	Perception of safety of public spaces	Property crime rates
		Rates of family violence
<i>Housing</i>	<i>No suitable indicators from Lowe et al. (2013)</i>	Housing affordability
		Population density
<i>Education</i>	Pedestrian access to school	Access to government primary schools
		Access to government secondary schools
<i>Employment and income</i>	Variety of jobs	Long term unemployment
		Unemployment rate
		Access to jobs
<i>Health and social services</i>	Self-reported health	Access to emergency centres
	Subjective wellbeing	
<i>Transport</i>	Traffic noise	Access to public transport
		Road traffic fatalities
		Road traffic injuries
		Household car ownership
<i>Public open space</i>	Variety of public space	Amount of public open space
	Access to play areas	
	Perception of quality of open space	
<i>Social cohesion and local democracy</i>	Opportunities to have a say on important issues	<i>No suitable indicators from Lowe et al. (2013)</i>
	Feeling part of your community	
	Social supports	
	Community acceptance of diverse culture	
<i>Leisure and culture</i>	Amount of entertainment venues	<i>No suitable indicators from Lowe et al. (2013)</i>
	Variety of entertainment venues	
	Number of sports and leisure clubs	
<i>Food and other local goods</i>	Urban agriculture	Density of fast food restaurants
		Proximity to healthy food
<i>Natural environment</i>	Air quality	Biodiversity

3.4 RESEARCH

In this paragraph, an elaboration will be given on how the indicators are going to be used throughout the research. The central question of the research is *'Is there a difference in (perceived) liveability between (formerly) Protestant and Catholic neighbourhoods in Belfast, Northern Ireland?'* and has the following secondary questions:

- 1) How can liveability at the neighbourhood level best be measured?
- 2) How is liveability perceived by inhabitants of one predominantly Protestant neighbourhood and one predominantly Catholic neighbourhood?
- 3) How is the perception of liveability linked to the spatial environment?
- 4) In what way do objective indicators influence the liveability of both neighbourhoods?

Consequently, the research will entail four main parts, of which the first three are based upon the secondary questions. However, in contrast to the secondary research questions, the results will firstly show how liveability at the neighbourhood level can best be measured, secondly it will show the actual liveability of both neighbourhoods, thirdly the perceived liveability and fourthly the actual liveability versus the perceived liveability.

3.4.1 MEASURING LIVEABILITY AT THE NEIGHBOURHOOD LEVEL

Macintyre & Ellaway (2003) state that there already has been constructed a lot of liveability measures for comparisons between cities, while this is substantially less for comparisons within cities. Therefore, the first part of the research will be a literature research, in which there will be investigated how liveability at the neighbourhood level can best be measured.

If some outstanding results arise from this literature review on how to best measure liveability at the neighbourhood level, this will be incorporated in the following parts of the research. If not, the research will be conducted following the steps elaborated on in the parts below.

3.4.2 PERCEPTION OF LIVEABILITY

To research the perception of liveability indicators by the residents of the neighbourhoods, surveys will be conducted within the neighbourhoods to ask the residents their satisfaction on certain indicators. For all indicators a statement is created in the following way: "Please indicate how satisfied you are with each of the following aspects of liveability in your neighbourhood", followed up by a list of relevant indicators. Values that can be given are on a scale from 1 to 5, with 1 being 'very unsatisfied', 2 being 'unsatisfied', 3 being 'neutral', 4 being 'satisfied' and 5 being 'very satisfied'.

This survey can be seen in *Appendix I*.

3.4.3 INFLUENCE OF OBJECTIVE INDICATORS

Researching the liveability of the neighbourhoods, based on objective indicators, will be done by examining secondary data. For every objective indicator, the measure, the data source and the value in the data source are listed below in *Appendix II*, divided in policy areas. The indicators are re-iterated from *Table 1* and are thus deduced from Lowe et al. (2013). Unfortunately, there are some policy areas for which there is no objective indicator available or suitable for this research. In those cases, a comparison cannot be made between the actual and the perceived liveability, resulting in a comparison between the neighbourhoods merely based on the perceived liveability.

3.5 COMPARISON BETWEEN THE NEIGHBOURHOODS

As mentioned before, the aim of this research is to find out whether there is a difference in the (perceived) liveability between a predominantly Protestant neighbourhood and a predominantly Catholic neighbourhood. Thus, the fourth and final part of the research will combine the results from the previous parts into an outcome on the central question of the research.

As the research is both about perceived liveability and actual liveability, the outcome basically entails two parts, congregating in the final, third part. The first part shows the actual liveability and the second part then also integrates the perception of the liveability. The results, for both actual liveability and perceived liveability, will then be compared against each other for both neighbourhoods. Finally, the results will be grouped per policy area, to find out whether there are differences in (perceived) liveability within certain policy areas between the two neighbourhoods.

3.5.1 ACTUAL LIVEABILITY

The first part, the actual liveability, can be easily transformed into an answer. For all objective indicators all values are either as a percentage of the total area of the neighbourhood or compared to the average of Belfast, which thus functions as a reference value. This analysis process is shown in *Figure 6*.

For example, when neighbourhood A has a high percentage of public open space, compared to neighbourhood B, it can be concluded that neighbourhood A has, on this specific indicator, a better liveability.

In case of indicators that are compared to the average of Belfast, it has to be kept in mind that when the value of the neighbourhood is better than the value of Belfast, this means that the liveability only is relatively good, as it does not necessarily mean that the value of Belfast is a good value, even though it functions as reference value.

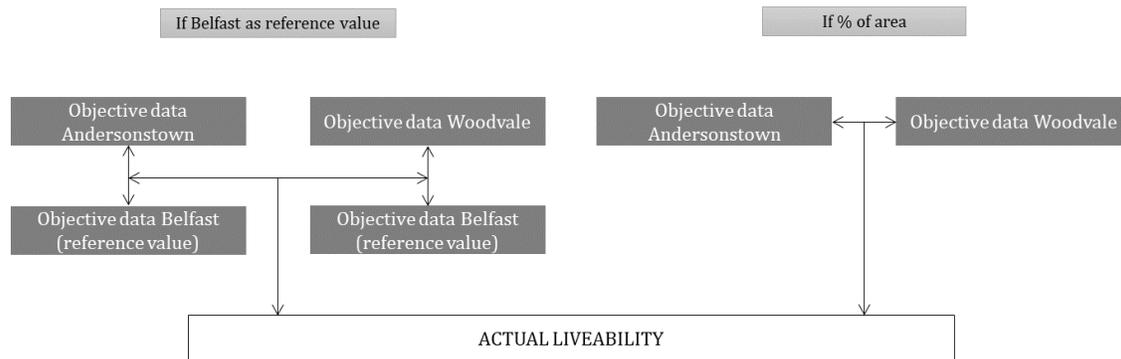


Figure 6: Scheme of analysis of the liveability.

3.5.2 PERCEIVED LIVEABILITY

The retrieved data of the second part of the research is suitable for creating a clear overview of the outcomes of the perceived liveability. Since in the surveys a scale of satisfaction is used, with five steps, results will be shown in a way that all values will be highlighted except for the 'neutral'-value, as this value does not specifically say anything about the satisfaction of respondents. By comparing the share of (very) satisfied respondents and the share of (very) unsatisfied respondents between both neighbourhoods, it becomes visible

how satisfaction about different indicators of liveability differs between both neighbourhoods. This analysis process is shown in *Figure 7*.

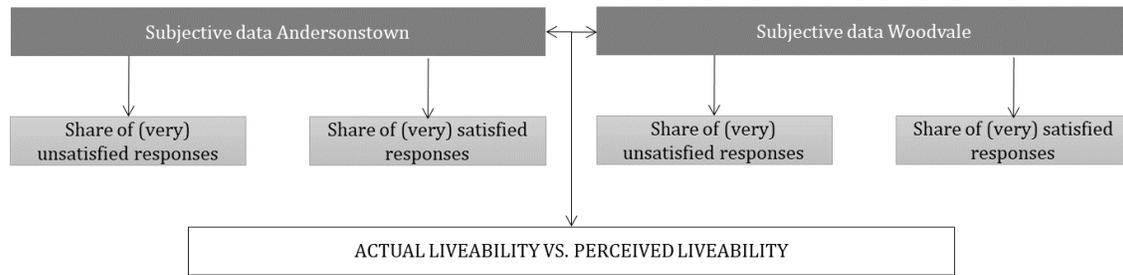


Figure 7: Scheme of analysis of the perceived liveability

3.5.3 ACTUAL LIVEABILITY VS. PERCEIVED LIVEABILITY

To come to an answer on the third part, the perceived liveability, the outcomes of the second and third part of the research (*Paragraph 4.2 & 4.3*) will be compared against each other. In this way it can be seen how perception of liveability (*Paragraph 4.2*) differs from actual liveability (*Paragraph 4.3*). This analysis process is shown in *Figure 8*.

For example, when neighbourhood A has a high amount of property crime rates (which is seen as bad for the liveability), while it has a high feeling of safety, it can be concluded that the perceived safety does not reflect the actual safety. In this way it can be concluded that the perceived liveability does not match the actual liveability.

Those results can be compared between both neighbourhoods, to show whether there is a difference in perceived liveability between both neighbourhoods.

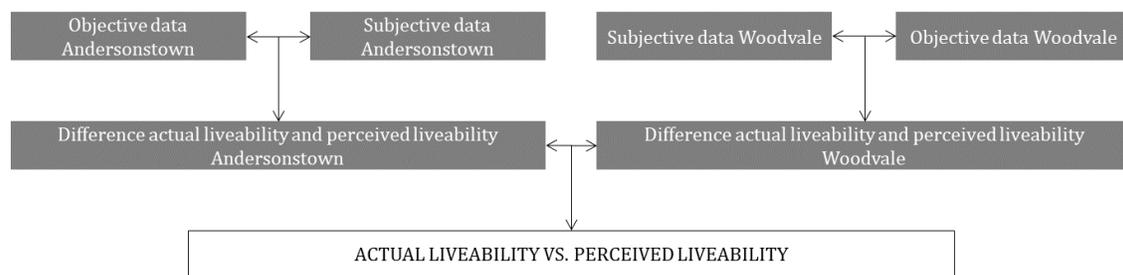


Figure 8: Scheme of analysis of the actual liveability versus the perceived liveability.

3.6 ETHICAL CONSIDERATIONS

During this research it is important to keep in mind that the past and the distinction between being a Protestant or being a Catholic is still a very sensitive topic. Therefore, it is very important to not make a mistake in saying in which type of neighbourhood you are, and to remain unbiased. Being an outsider in the topic, this is one the one hand a benefit, but on the other hand could also be a disadvantage. The benefit of being an unbiased person/researcher could be that you are welcome in both neighbourhoods. The disadvantage could be that you must be careful with saying things on this topic.

Another possible problem could be the privacy of the data of the respondents. As the research will be done on the scalar level of a neighbourhood, one cannot specifically relate the outcomes of the research/survey to one specific person. Therefore, the only person-related variable of the research/survey will be the neighbourhood they are living in. So, other variables like age or gender, will not be used in the surveys, so to decrease the personal sensitivity. However, as the division is made between a predominantly Protestant neighbourhood and a predominantly Catholic neighbourhood, it is important not to use any data which could provoke residents of the other neighbourhood, or related persons.

4. RESULTS

4.1 LIVEABILITY AT THE NEIGHBOURHOOD LEVEL

Norouzian-Maleki et al. (2018) argue that liveability of a neighbourhood is directly influenced by a residents' perception of the spatial environment. Furthermore, the authors state that it thus is important to research the perception of people of their own living environment, so that liveability of their neighbourhood can be improved. This supports the aim of this research to not only investigate objective indicators measuring the liveability of a neighbourhood, but also to research the perceived liveability of the residents of a neighbourhood.

Apart from this stance of Norouzian-Maleki et al. (2018), there is less known about the process of measuring liveability at the neighbourhood level. Some researches have investigated the role of a specific indicator on the neighbourhood level (e.g. Allen et al. (2018), Grasser et al. (2016) & Thomas et al. (2011)). However, there still is no clear guide developed on how to measure liveability at the neighbourhood level. Hence this research will measure liveability at the neighbourhood level based on previous researches, like Lowe et al. (2013), on liveability at the city level. This is in line with the statement made by Alderton et al. (2019), that there still are no good indicators for dissimilarities within cities.

4.2 INFLUENCE OF OBJECTIVE INDICATORS

Most of the data that is used in the research of the influence of objective indicators is retrieved from NISRA. The data used by this agency is mostly data, which is collected by other instances. This causes differences in years in which the data is collected. As a large amount of the outcomes of the data is in ratio to 100.000 persons, it is important to use the population level of the respective years. Therefore, the population levels for Belfast, Andersonstown and Woodvale are used according to the levels shown in *Table 5*, which is based on data from NISRA (2018).

Table 2: Table showing the population of Belfast, Andersonstown and Woodvale for the period 2014-2018

POPULATION	2014	2015	2016	2017	2018
<i>Inhabitants Belfast</i>	283166	285002	285687	286082	287532
<i>Inhabitants Andersonstown</i>	4778	4757	4739	4697	4642
<i>Inhabitants Woodvale</i>	3878	3966	4010	4073	4104

In *paragraph 3.4.1* it is mentioned that the objective data used consists of two parts. On the one hand there is data of which the values are related to the value of Belfast, which functions as a reference value. On the other hand, there are data, based on GIS-research, which values are percentages of the total area. In the next two paragraphs outcomes for both neighbourhoods will be shown divided amongst the distinction made based on the two types of data.

In case of the data used for the GIS-research, it is important to define several measures first and to determine how this data is collected. Therefore, an overview will be given below of the measures, their definitions and its data collection.

- **Access to public transport** is measured in share of area within 400 metres of a bus stop or within 800 metres of a train station (Lowe et al., 2013). For this indicator, only currently served bus stop or train stations are used, which are located within the neighbourhood or within respectively 400 metres or 800 metres distance from the neighbourhood.

- **Density of fast food restaurants** is measured in share of area within 1600 metres of a fast food restaurant. The choice for 1600 metres is based on the guidelines for healthy food by Design for Health (2008). According to Morgenstern et al. (2009), places are defined as fast food restaurants when they had at least two of the following characteristics: “expedited food service, takeout business, limited or no wait staff, or customers who pay prior to receiving food” (p.166). Based on in-field experiences and online research, places were designated as fast food restaurant if the fulfilled this criterion. Due to the size of the neighbourhood, in relation to the scale of the measure (1600 metres) it is decided to only research the fast food restaurants within the neighbourhoods or within 800 metres distance from the neighbourhoods.

- **Proximity of healthy food** is measured in share of area within 1600m of a healthy food store (Design for Health, 2008). According to Design for Health (2008), this can be measured by measuring supermarkets or fruits and vegetables stores, which they define as “a farmer's market or an establishment with a NAICS code of 445110 or 455230” (p.14). However, as NAICS-codes are only applicable to Northern American businesses, they cannot be used for Belfast. Businesses classified with the NAICS-code 445110 are “supermarkets and other grocery (except convenience) stores” (NAICS, 2019). According to the United States Census Bureau, the NAICS code 455230 does not exist. However, the NAICS code 445230 does exist and firms classified with this code are “fruit and vegetable markets” (NAICS, 2019). To make sure that businesses in Belfast can be classified as healthy food stores, based on this definition, in-field experiences will be done to select businesses that agree to this criterion. As with fast food restaurants, it is decided to only research healthy food stores within the neighbourhoods or within 800 metres distance from the neighbourhoods.

- **Amount of public open space** is measured in share of total area. According to Daker et al., public open space is defined as “land which has been reserved for recreation, sport activities and the preservation of natural environments” (2016, p.145). Additionally, they also state that a piece of land can only be defined as public open space when it is of a substantial size that it can be used for any of the activities listed above and that it is freely accessible to the public. Based on these criteria a selection of public open spaces within the neighbourhoods will be made based on in-field experiences and online research of aerial photos.

- **Biodiversity** is measured in green space as share of total area. According to Daker et al., green space is defined as “park, garden, cemetery (...) or an undeveloped open land with no buildings or built structures and accessible to the public” (2016, p.145). Based on these criteria a selection of public open spaces within the neighbourhoods will be made based on in-field experiences and online research of aerial photos.

As mentioned before, scalar levels of the indicators are substantially large relative to the size of the neighbourhood. To counteract any extreme values (e.g. a hundred percent area coverage), outcomes are also created with a decreased distance to the bus stops, train stations, healthy food stores and fast food restaurants. To enhance a better comparison between both neighbourhoods it has been chosen to use the outcomes for which both neighbourhoods have a value smaller than 100%.

Figure 9: List of indicators, used in the GIS-research, including level of measurement based on relating literature.

4.2.1 ANDERSONSTOWN

In relation to the reference value, *Appendix III* shows us that there are six out of fourteen indicators for which Andersonstown scores better than the reference value, Belfast. Three of these indicators are within the policy area of 'Crime and safety', whereas the other three indicators are divided over the policy areas 'Housing', 'Education' and 'Transport'. On the other hand, there are four indicators for which Andersonstown scores worse than the reference value, Belfast. Of those indicators, two belong to the policy area 'Employment and income', while the other two relate to the policy areas 'Education' and 'Transport'. The remaining four indicators are within a ten percent margin of the reference value and are thus seen as equal to the reference value.

The data from the GIS-researches shows us that, using the original definitions with the respective distances (400, 800 and 1600 metres), as stated in *Figure 9*, two out of five indicators completely cover Andersonstown, while a third indicator covers the neighbourhood for 99.75 percent. This means that 100, 100 and 99.75 percent of Andersonstown is within reach of respectively a fast food restaurant, healthy food store and a bus stop and/or train station, according to the given definitions. Adjusting these definitions, so that indicators cover a smaller area of the neighbourhood, should give a better insight in the coverage of Andersonstown, and thereby makes it easier to compare with other neighbourhoods. This is useful as the indicators were originally designed for liveability research on a city level, while this research is on a neighbourhood level, and thus a smaller scalar level, which makes justifiable to adjust the distances.

Distances are once (or twice) halved, until less than the complete area of the neighbourhood is covered by the indicator. In this way a proper comparison can be made between both neighbourhoods, which is not the case when both neighbourhoods are completely covered by a certain indicator. With these adjusted definitions, Andersonstown is better covered by healthy food stores, than by fast food restaurants, which is a positive outcome for the policy area 'Food and other local goods'.

Lastly, *Appendix IV* shows that a small part of Andersonstown is classified as public open space or green space, which accounts for respectively 3.33 and 3.41 percent of the total area (see *Appendices VIII & X*). It can thus be said that this is a negative outcome for the policy areas 'Public open space' and 'Natural environment'.

To summarize, Andersonstown has several policy areas for which its scores are good. This accounts for 'Crime and safety', 'Housing' and 'Food and other local goods'. It however also has some policy areas, for which it can use some improvement. This applies for 'Employment and income', 'Public open space' and 'Natural environment'. The remaining policy areas, 'Education', 'Health and social services' and 'Transport' are areas which are not exceeding, not positively, nor negatively.

4.2.2 WOODVALE

Looking at the data from Woodvale, related to the reference value, *Appendix V* shows us that there are five out of fourteen indicators for which Woodvale has a better score than the reference value, Belfast. These indicators are divided over the policy areas 'Crime and safety', 'Housing', 'Education', 'Health and social services' and 'Transport'. On the other hand, there are eight indicators for which Woodvale scores worse than the reference value, Belfast. Three of these indicators are within the policy area of 'Employment and income', while a further two relate to the policy area 'Crime and safety'. The remaining three indicators are divided over the policy areas 'Housing', 'Education' and 'Transport'. Lastly, there is only one indicator for which Woodvale scores equal to the reference value. This indicator belongs to the policy area 'Transport'.

Like the GIS-researches from Andersonstown, some indicators completely cover Woodvale using the original definitions with the respective distances. In contrast to Andersonstown this accounts for three out of five indicators. This means that 100 percent of Woodvale is within distance of both fast food restaurants and healthy food stores as for bus stops and/or train stations, according to the definitions.

Thus, the GIS-researches of Woodvale also require adjustment of the definitions, in the same way as is done for the GIS-researches of Andersonstown, with as a result that a larger part of Woodvale is covered by fast food restaurants than it is by healthy food stores, which is a negative result for the policy area 'Food and other local goods'.

Lastly, *Appendix VI* shows us that the open public space and green space account for respectively 17.03 and 13.33 percent of the area of Woodvale, which is not good nor bad (see *Appendices IX & XI*).

To summarize, Woodvale has two policy areas for which its scores are good. This accounts for 'Health and social services' and 'Transport'. It however also has several policy areas, for which it can use some improvement. This applies for 'Crime and Safety', 'Employment and income' and 'Food and other local goods'. The remaining policy areas, 'Housing', 'Education', 'Public open space' and 'Natural environment' are areas which are not exceeding, not positively, nor negatively.

4.3 PERCEPTION OF LIVEABILITY

4.3.1 ANDERSONSTOWN

The results of the research into the perceived liveability of Andersonstown show that residents of Andersonstown are positive about their neighbourhood. *Figure 10* shows that for all indicators at least 30 percent is satisfied or very satisfied, with eight out of nineteen indicators showing rates above 50 percent. Those eight indicators belong to the policy areas of 'Crime and safety', 'Education', 'Health and social services', 'Social cohesion and local democracy' and 'Leisure and culture'. The highest share of (very) satisfied ratings is 83 percent, which accounts for two indicators, which are linked to the policy areas 'Crime and safety' and 'Health and social services'.

Looking into the indicators with the lowest rate of satisfaction, the indicators for which respondents are unsatisfied or very unsatisfied, it is visible that only one out of nineteen indicators has a share of (very) unsatisfied above 50 percent. This indicator is linked to the policy area 'Public open space'. Furthermore, ten out of nineteen indicators have a share of less than 30 percent of (very) unsatisfied.

So, for Andersonstown it can be said that overall respondents are quite satisfied with their neighbourhood, especially with the policy areas 'Crime and safety', 'Education' and 'Health and social services'. On the other hand, the least valued policy areas are 'Public open space' and 'Natural environment'.

4.3.2 WOODVALE

Residents of Woodvale are overall less positive with their neighbourhood than residents of Andersonstown. Results of the research of perceived liveability in Woodvale show that only two out of nineteen indicators in Woodvale have a share of above 30 percent of (very) satisfied ratings. These two indicators are linked to the policy areas 'Crime and safety' and 'Leisure and culture'. A remarkable thing is the fact that for one indicator 0 percent of the respondents were (very) satisfied. This indicator belongs to the policy area 'Leisure and culture'.

On the other hand, looking at the share of (very) unsatisfied ratings, it can be seen in *Figure 11* that only five out of nineteen indicators have a share of less than 50 percent of (very) unsatisfied ratings, while the majority of those five indicators has a share very close to 50 percent. Only one indicator has a relatively low share of (very) unsatisfied ratings, and this indicator is linked to the policy area 'Crime and safety'. The indicators which have the highest share of (very) unsatisfied ratings belong to the policy areas 'Leisure and culture', 'Social cohesion and local democracy', 'Public open space' and 'Employment and income'.

Concludingly, it can be said that a substantially large number of respondents, and with that residents of Woodvale, are unsatisfied about their neighbourhood, which reflects in the given rating of satisfaction of the indicators. This accounts especially for the policy areas 'Employment and income' and 'Public open space', whereas on the other hand 'Crime and safety' and 'Transport' are the best valued policy areas, even though the rating of these policy areas is still not good.

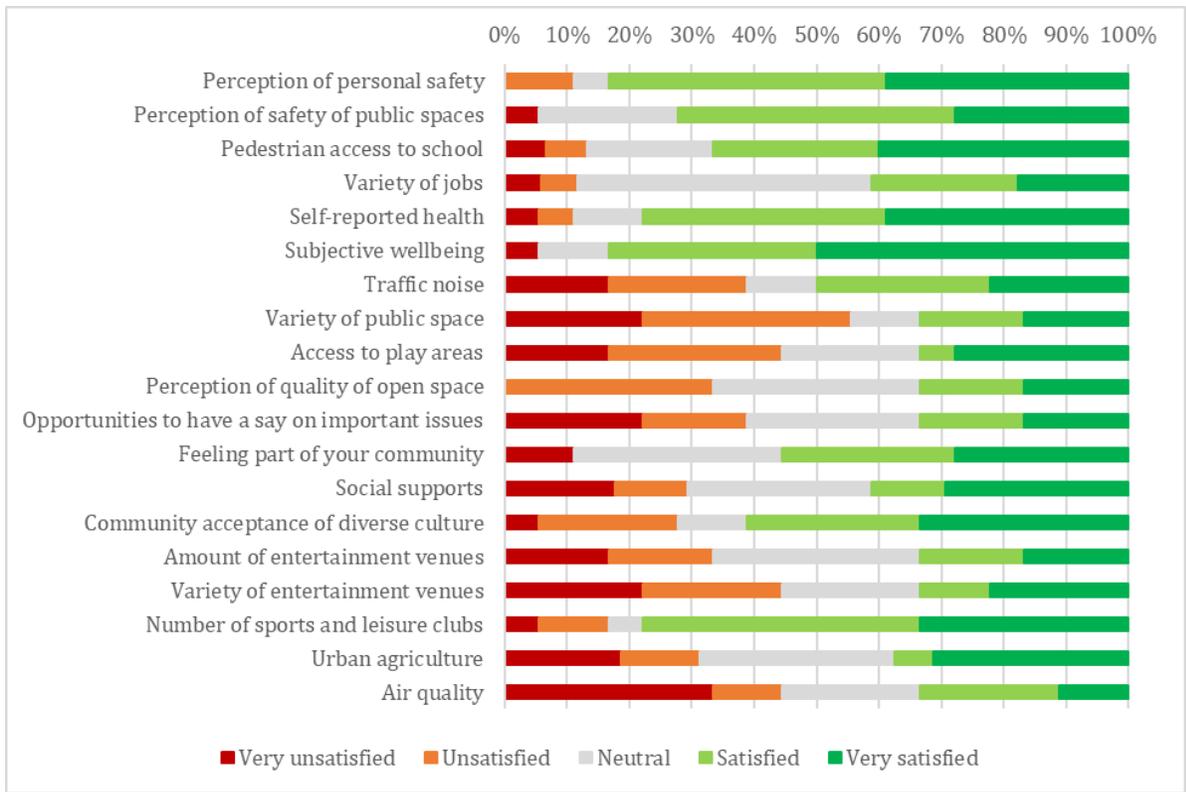


Figure 10: Graph showing the share of satisfaction (light and dark green) and dissatisfaction (red and orange) for Andersonstown.

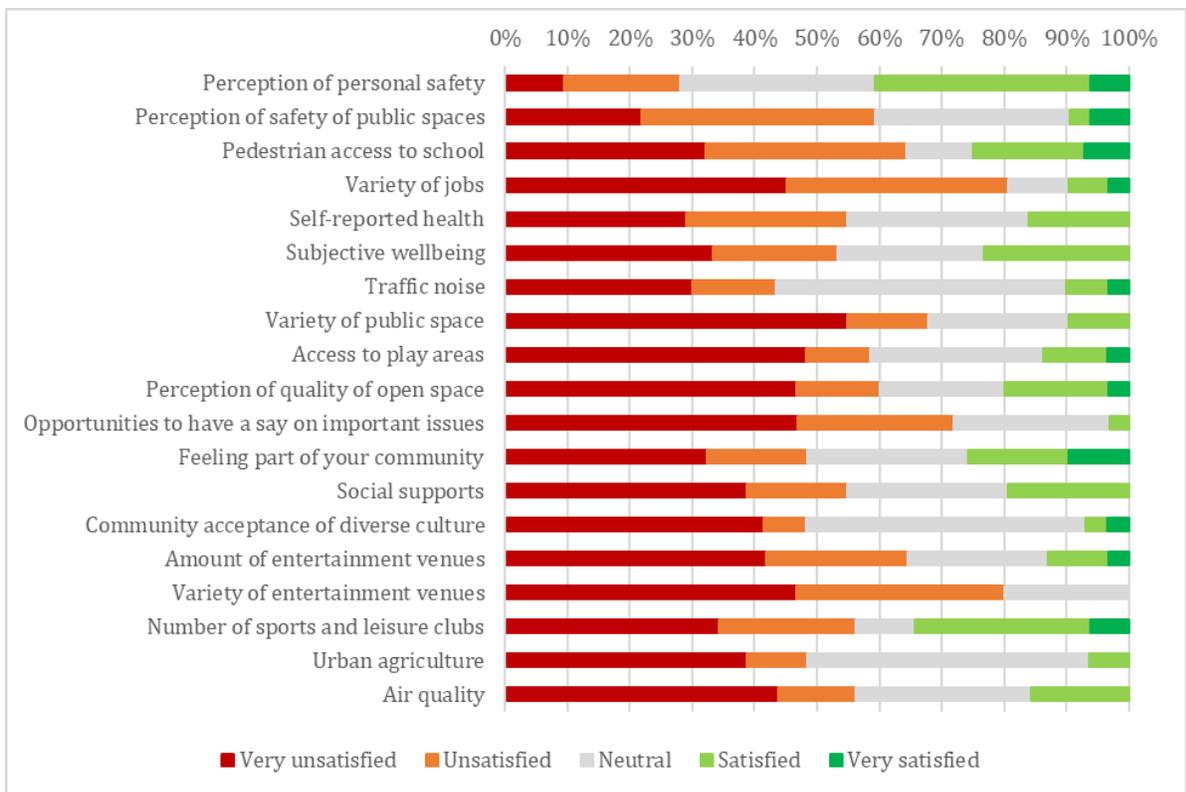


Figure 11: Graph showing the share of satisfaction (light and dark green) and dissatisfaction (red and orange) for Woodvale.

4.4 COMPARISON BETWEEN THE NEIGHBOURHOODS

This paragraph will make a comparison in (perceived) liveability between Andersonstown and Woodvale, based on the different policy areas. First, comparisons will be made between actual and perceived liveability within both neighbourhoods, after which the actual and perceived liveability will be compared between both neighbourhoods. Finally, for each policy area the results of the previous two paragraphs are combined into a graph, which shows the approximate relationship between perceived liveability (*Paragraph 4.2*) and actual liveability (*Paragraph 4.3*). The x-axis represents the perceived liveability, on a scale from 1 to 5, in relation to the results of the surveys. The y-axis, on the other hand, shows the actual liveability. The values on the y-axis are not exact values of the outcomes, but mere representations of the results, which is due to the ability of values to be distant from the reference value; there is no clear range of possible values. Besides that, different ranges of values of different indicators belonging to a respective policy area make it hard to combine it into a specific value on the y-axis. Thus, the location on the y-axis must be seen as a representation of the outcomes. *Figure 12* shows that when a policy area scores good on both perceived and actual liveability, it will be in the upper right quarter. When the combined value of a policy area is in the upper left quarter, it means that it scores good on the actual liveability, but it does not score good on the perceived liveability. For every policy area, the combined values of perceived and actual liveability of both Andersonstown and Woodvale are in a similar graph, with the symbol 'A' being the value of Andersonstown and the symbol 'W' being the value of Woodvale.

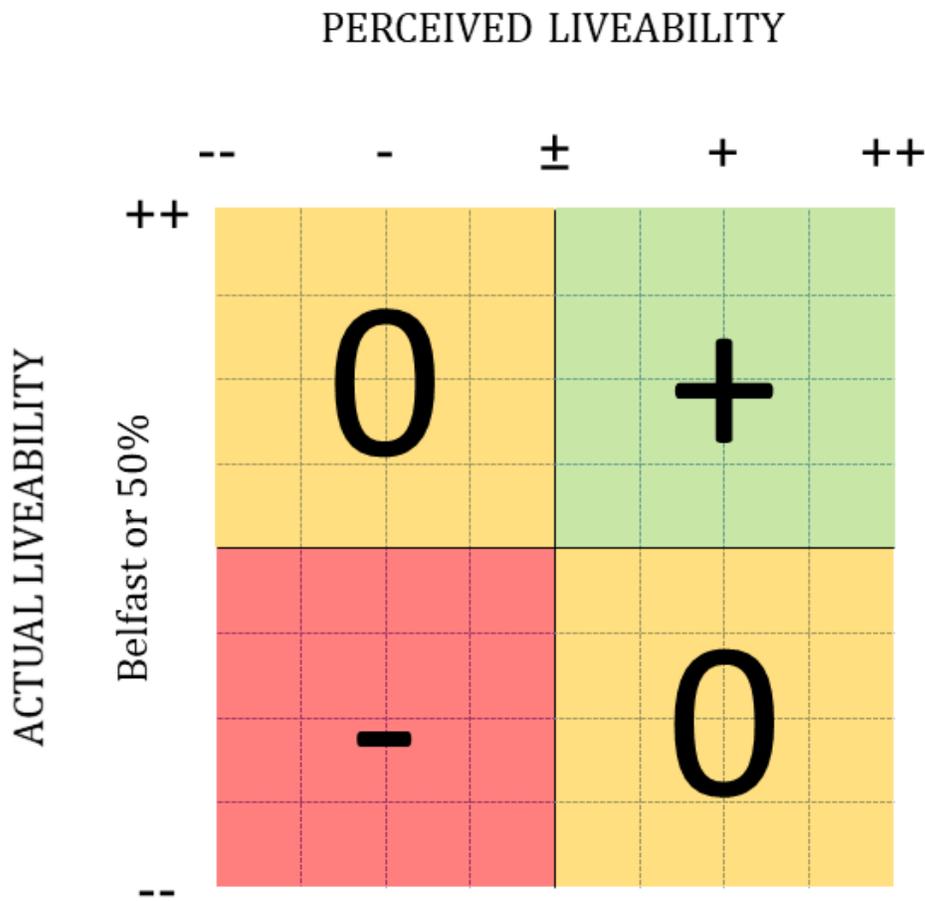


Figure 12: Graph showing the schematic overview of the relationship between perceived liveability and actual liveability.

Paragraphs 4.2.1 and 4.3.1 showed the results of both the actual liveability and the perceived liveability of Andersonstown. When comparing the best and least valued policy areas of the objective indicators (*Paragraph 4.2.1*) with the best and least policy areas of the perceived liveability (*Paragraph 4.3.1*), it becomes visible that some policy areas corresponds between both parts. This accounts for the policy areas 'Crime and safety', which is valued positively in both cases, 'Public open space' and 'Natural environment', which are both valued negatively in both cases. There is no substantially large dissimilarity in the valuation of policy areas, as there is no policy area which is valued positively on one side while being valued negatively on the other side, or vice versa.

In the case of Woodvale there are also some similarities between the best and least valued policy areas of the objective indicators (*Paragraph 4.2.2*) and the best and least valued policy areas of the perceived liveability (*Paragraph 4.3.2*). This applies to the policy areas 'Transport', which is valued positively in both cases, and 'Employment and income', which is valued negatively in both cases. In contrast, there is also one dissimilarity, which is the case for the policy area 'Crime and safety', which is valued negatively for the objective indicators, whereas it is valued positively for the perceived liveability.

So, concludingly, in most cases actual liveability and perceived liveability is valued the same for both neighbourhoods, except for the policy area of 'Crime and safety' for Woodvale. However, it must be noted that this is only relative to the other policy areas in each neighbourhood. Therefore, it is also important to show the differences between both neighbourhoods, which will be done below.

Looking at *Figures 13 up to and including 23*, it is visible that perceived liveability is better in Andersonstown than it is in Woodvale for all eleven policy areas. On the contrary, this is not the case for the actual liveability, where Woodvale scores better for seven out of eleven policy areas, excluding another policy area where both the scores of Andersonstown and Woodvale are equal. The only policy areas where Andersonstown has both a better actual and perceived liveability are 'Crime and safety', 'Employment and income' and 'Food and other local goods'.

As mentioned before in *Paragraph 4.2.2*, residents of Woodvale are overall unsatisfied with their neighbourhood, which is reflected in the figures below. There is no policy area for which Woodvale is in the right half of the graphs, which is all due to the low rate of satisfaction. This is remarkable because in approximately half of the policy areas the scores of Woodvale are in the upper half of the graph, which means the actual liveability is good. An example of a policy area for which Woodvale has a better actual liveability than Andersonstown, but where the perceived liveability is better in Andersonstown, is 'Public open space'. One of the objective indicators of this policy area is the amount of public open space. In *Figures 13 & 14* it can be seen that the amount of public open space is considerably larger in Woodvale than in Andersonstown. Nevertheless, 'Public open space' is perceived worse in Woodvale than in Andersonstown.

For Andersonstown this is the other way around, where only one policy area is in left half of the graph, meaning that only for this policy area, 'Natural environment', residents of Andersonstown are unsatisfied with it. The outcomes of the actual liveability do not reflect this view, as seven policy areas are in the lower half of the graph, which means a relatively low actual liveability.

To summarize it can be said that the perceived liveability is better for all policy areas in Andersonstown, while Woodvale has a better actual liveability in seven out of eleven indicators, while Andersonstown only has a better actual liveability for three indicators.



Figure 13: Public open space in Andersonstown.



Figure 14: Public open space in Woodvale.

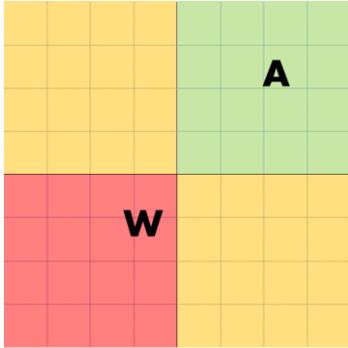


Figure 15: Crime and safety

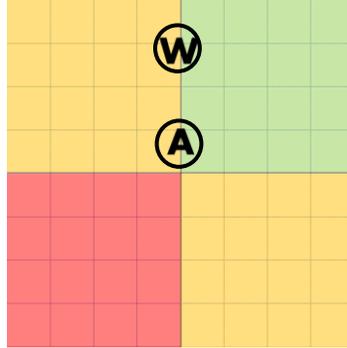


Figure 16: Housing

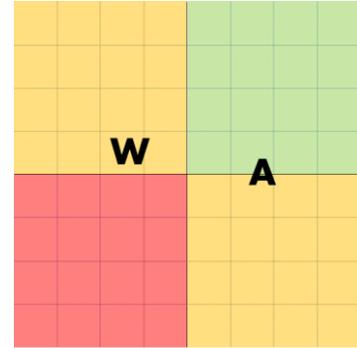


Figure 17: Education

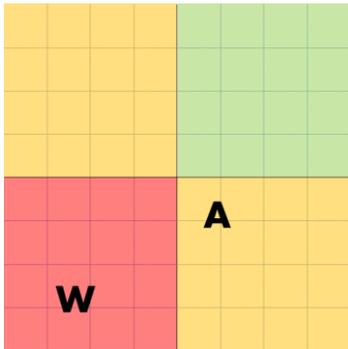


Figure 18: Employment and income

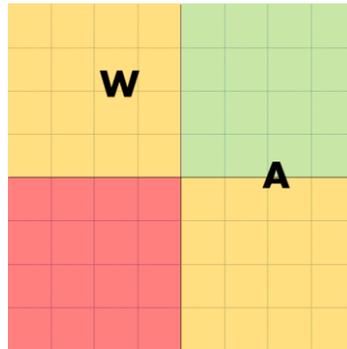


Figure 19: Health and social services

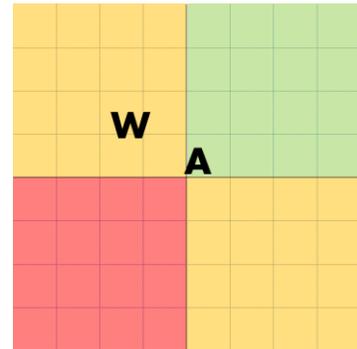


Figure 20: Transport services

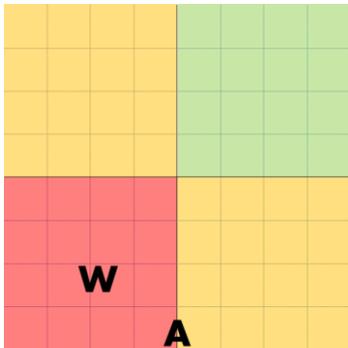


Figure 21: Public open space

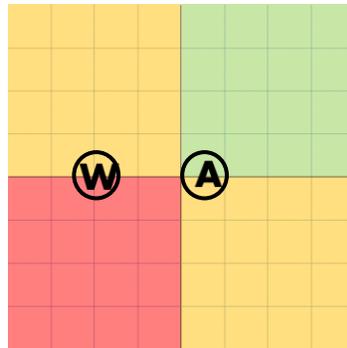


Figure 22: Social cohesion and local democracy

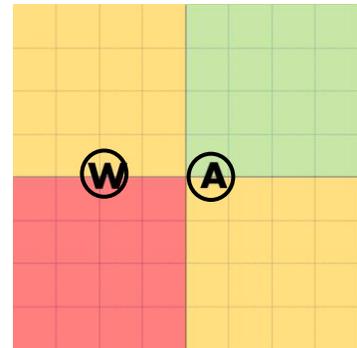


Figure 23: Leisure and culture

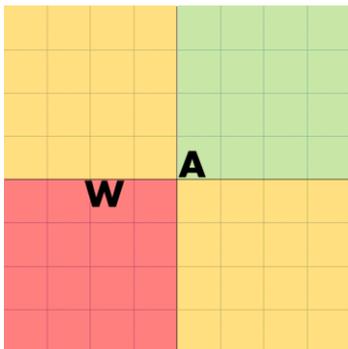


Figure 24: Food and other local goods

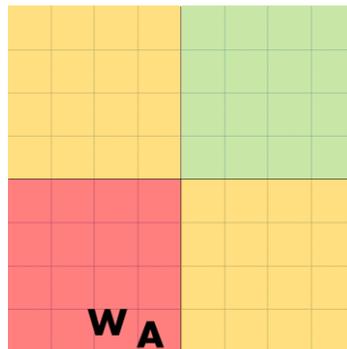


Figure 25: Natural environment

**Encircled positions of both Andersonstown and Woodvale are policy areas which has no objective or subjective indicator and thus no value. If so, these policy areas are placed respectively on the x-axis or the y-axis.*

5. CONCLUSION

The results of this research highlight that there still is not much known about how to research a difference in liveability between neighbourhoods. Therefore, it is chosen to perform this research based on indicators used for a research on liveability on a city level, instead of a neighbourhood level.

In this light, this research shows that there is a difference in both actual and perceived liveability between the researched Catholic and Protestant neighbourhood, in this case respectively Andersonstown and Woodvale. Within both neighbourhoods, actual liveability and perceived liveability are valued the same in most case, except for the policy area 'Crime and safety' for Woodvale, where the actual liveability is valued negatively, whereas the perceived liveability is valued positively.

When looking at the similarities and dissimilarities between both neighbourhoods, the results of this research highlight that there is a substantially large difference between actual and perceived liveability between both neighbourhoods. For all eleven policy areas, the Catholic neighbourhood, Andersonstown, has a better perceived liveability, whereas for seven out of the eleven policy areas, the Protestant neighbourhood, Woodvale has a better actual liveability. This accounts for the policy areas 'Housing', 'Education', 'Health and social services', 'Transport', 'Public open space', 'Leisure and culture' and 'Natural environment'.

However, it must be noted that all indicators used in the research for the determination of liveability are relative to Belfast or to the other neighbourhood. It thus can say anything about differences in (perceived) liveability between a Catholic neighbourhood and a Protestant neighbourhood in Belfast, but not necessarily about the actual liveability. In line with the statements of Cummins (2000) and Van Kamp et al. (2003) about the choice and requirement of several types of indicators (subjective and/or objective), this research does show that subjective indicators are important when the used reference value is not a clear reflection of a good actual liveability, which is the problem with Belfast as reference value.

Not only the choice to include both subjective and objective indicators has been an advantage for the research and its results, also the fact that the distinction based on policy areas is made, can be an advantage for the results of the research. This distinction makes it easy to see differences between different policy areas, which can be a good reflection of real-life situations. A certain distinction can be especially useful for policy integration as this is categorized based on a similar distinction.

However, this distinction can also negatively influence the process and the results of the research. This is since the amount of different policy areas can be quite large. This makes it that there needs to be an indicator available for both the actual and perceived liveability of all policy areas, in order to optimize the research and its results. Unfortunately, in this research there were not indicators (subjective or objective) available for all policy areas, which is a flaw in the research.

Furthermore, it must be noted that it would have been better to create a list of indicators for which all subjective indicators resemble a specific objective indicator, so that a better comparison can be made not only between indicators, but also between policy areas. Currently, slightly different indicators are compared within an policy area, which does not necessarily have to say something about a difference between perceived liveability and actual liveability.

For future research it could be wise to create a list of indicators, for which each subjective indicator can be related to a specific objective indicator, as this will result in a more valuable comparison between policy areas, because of the fact that objective and subjective indicators are based on the same grounds.

Looking at the quality of the data and the results, the quality of the data retrieved from the surveys can be improved either by increasing the amount of respondents, in case of Andersonstown, or by conducting the surveys at several different parts of the neighbourhood, in case of Woodvale. The latter one is because all results are retrieved by surveys handed in at the Woodvale Community Centre, which normally results in by the survey being filled in by one part of the society.

Next to this, when comparing the values of the objective indicator of the neighbourhoods to Belfast, there are some indicators, for which a high or low value can be seen in two ways. For example, the indicator 'population density' can be seen as a negative or a positive indicator, as a low population density can make a space more open and less crowded, while on the other hand, a high population density can work hand in hand with a high concentration of facilities, public transport, etcetera. Thus, in some cases a choice was made to choose one of both sides, in the case of population density it is seen as a positive indicator.

Finally, relating back to the research question *'Is there a difference in (perceived) liveability between (formerly) Protestant and Catholic neighbourhoods in Belfast, Northern Ireland?'*, it is important to note that the results of this research only relate to two specific neighbourhoods, one Protestant, one Catholic and does not necessarily say anything about the overall difference in (perceived) liveability between (formerly) Protestant and Catholic neighbourhoods in Belfast, Northern Ireland. It only is a small case selection which serves as an example of a difference between a Protestant and a Catholic neighbourhood. Other factors, like surrounding environment, spatial location, share of Protestant/Catholic inhabitants, can all differ between other Protestant or Catholic neighbourhoods, which makes it impossible to generalize the results from this research into an answer to the central research question. Concludingly, it can only be said, that in the case of those two specific neighbourhoods there is a difference in (perceived) liveability, but this cannot be generalized for a difference in (perceived) liveability between (formerly) Protestant and Catholic neighbourhoods in Belfast, Northern Ireland.

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Satisfaction with liveability indicators

The following statements are statements about several indicators of liveability. Please indicate how satisfied you are with each of the following aspects of liveability in your neighbourhood. (For example, if you are very satisfied with the personal safety in your neighbourhood, then cross the '5'-box, which stands for very satisfied).

Personal safety
Safety of public spaces
Ease of walking to school
Variety of jobs
Personal health
Personal wellbeing (so not only health)
Amount of traffic noise
Variety of public spaces
Access to play areas
Quality of open space
Opportunities to have a say on important issues
Feeling part of your community
Social support you can get
Acceptance of diverse cultures
Amount of entertainment venues
Variety of entertainment venues
Number of sports and leisure clubs
Availability of urban agriculture
Air quality

	<i>Very unsatisfied</i>	<i>Unsatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very satisfied</i>
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	

Many thanks for filling in this survey!

APPENDIX II – LIST OF ALL OBJECTIVE INDICATOR USED IN THE RESEARCH, INCLUDING THEIR RESPECTIVE MEASURES, DATA SOURCES AND VALUE IN THE DATA SOURCE

POLICY AREA	OBJECTIVE INDICATOR	MEASURE	DATA SOURCE	VALUE IN DATA SOURCE
<i>Crime and safety</i>	Rates of crime against the person	Per 100,000 persons (Belfast as reference value)	Police Service of Northern Ireland, 2018a	"Violence against the person, Sexual offences and Robbery"
	Property crime rates	Per 100,000 persons (Belfast as reference value)	Police Service of Northern Ireland, 2018a	"Burglary"; "Theft offences"; "Criminal damage"
	Rates of family violence	Per 100,000 persons (Belfast as reference value)	Police Service of Northern Ireland, 2018b	"Incidents Recorded with a Domestic Abuse Motivation"
<i>Housing</i>	Housing affordability	Mean capital value (Belfast as reference value)	Land and Property Services Statistics Branch & Department of Finance, 2018	"Average Capital Value"
	Population density	Persons per square kilometre (Belfast as reference value)	Northern Ireland Statistics and Research Agency, 2008 & 2018	"Persons" & "Kilometres Squared"
<i>Education</i>	Access to government primary schools	Amount of primary schools per 100,000 persons (Belfast as reference value)	Department of Education, 2018	"Primary"
	Access to government secondary schools	Amount of secondary schools per 100,000 persons (Belfast as reference value)	Department of Education, 2018	"Post-primary"
<i>Employment and income</i>	Long term unemployment	Share of total unemployed persons (Belfast as reference value)	Economic and Labour Markets Statistics Branch, 2017	"Claimant Count Long Term Unemployed Annual Averages"
	Unemployment rate	Share of population (Belfast as reference value)	Economic and Labour Markets Statistics Branch, 2018	"Claimant Count Annual Averages (%)"

POLICY AREA	OBJECTIVE INDICATOR	MEASURE	DATA SOURCE	VALUE IN DATA SOURCE
Employment and income (continued)	Access to jobs	Amount of jobs in neighbourhood per 100,000 persons (Belfast as reference value)	Business Register and Employment Survey Section, Economic and Labour Market Statistics Branch & Department of Finance, 2017	"Employee jobs"
Health and social services	Access to emergency centres	Mean travel time in minutes to the nearest emergency centre (Belfast as reference value)	Department of Health, Social Services and Public Safety, 2004	"Time to nearest Hospital with A&E including Minor Injury Units (average mins)"
Transport	Access to public transport	Share of area within 400m of a bus stop or within 800m of a train station (in %)	<i>~to be calculated using GIS, using both data inside/outside of the neighbourhood~</i>	N/A
	Road traffic fatalities	Per 100,000 persons (Belfast as reference value)	Police Service of Northern Ireland, 2017	"Killed"
	Road traffic injuries	Per 100,000 persons (Belfast as reference value)	Police Service of Northern Ireland, 2017	"Seriously injured"; "Slightly injured"
	Household car ownership	Per 100,000 persons (Belfast as reference value)	Driver & Vehicle Agency NI, 2016	"Licensed Cars"
Public open space	Amount of public open space	Share of total area (in %)	<i>~to be calculated using GIS~</i>	N/A
Social cohesion and local democracy			<i>No suitable indicators from Lowe et al. (2013)</i>	
Leisure and culture			<i>No suitable indicators from Lowe et al. (2013)</i>	

POLICY AREA	OBJECTIVE INDICATOR	MEASURE	DATA SOURCE	VALUE IN DATA SOURCE
Food and other local goods	Density of fast food restaurants	Share of area within 1600m of a fast food restaurant (in %)	~to be calculated using GIS, using both data inside/outside of the neighbourhood~	N/A
	Proximity to healthy food	Share of area within 1600m of a healthy food store (in %)	~to be calculated using GIS, using both data inside/outside of the neighbourhood~	N/A
Natural environment	Biodiversity	Green space as share of total area (in %)	~to be calculated using GIS~	N/A

APPENDIX III - TABLE SHOWING THE VALUES OF THE OBJECTIVE INDICATORS FOR ANDERSONSTOWN AND THEIR RELATIVE VALUE COMPARED TO BELFAST

POLICY AREA	INDICATOR	MEASURE	VALUE	BELFAST (REFERENCE VALUE)	ANDERSONSTOWN COMPARED TO BELFAST		
					BETTER	EQUAL (WITHIN 10%)	WORSE
Crime and safety	Rates of crime against the person	Per 100.000 persons	1659	4140			
	Property crime rates	Per 100.000 persons	2240	5991			
	Rates of family violence	Per 100.000 persons	1379	2953			
Housing	Housing affordability	Mean value	119647	120389			
	Population density	Persons per square km	4298	2503			
Education	Access to government primary schools	Per 100.000 persons	43.08	34.78			
	Access to government secondary schools	Per 100.000 persons	0	11.82			
	Long term unemployment	Share of total unemployed	32.20	29.25			
Employment and income	Unemployment rate	Share of population	3.20	3.29			
	Access to jobs	Per 100.000 persons	30019	78333			
	Access to emergency centres	Mean travel time in minutes	6.00	5.53			
Transport	Road traffic fatalities	Per 100.000 persons	0	1.05			
	Road traffic injuries	Per 100.000 persons	703	748			
	Household car ownership	Per 100.000 persons	36949	46882			

APPENDIX IV - OVERVIEW OF THE RESULTS OF THE GIS-RESEARCHES OF ANDERSONSTOWN

POLICY AREA	INDICATOR	MEASURE	VALUE	APPENDIX
<i>Transport</i>	Access to public transport	Share of area within 400m of a bus stop or within 800m of a train station (in %)	99.75	
		Share of area within 200m of a bus stop or within 400m of a train station (in %)	59.57	Appendix IX
<i>Food and other local goods</i>	Density of fast food restaurants	Share of area within 1600m of a fast food restaurant (in %)	100	
		Share of area within 800m of a fast food restaurant (in %)	100	
		Share of area within 400m of a fast food restaurant (in %)	65.68	Appendix XI
	Proximity of healthy food	Share of area within 1600m of a healthy food store (in %)	100	
		Share of area within 800m of a healthy food store (in %)	100	
		Share of area within 400m of a healthy food store (in %)	75.76	Appendix XIII
<i>Public open space</i>	Amount of public open space	Share of total area (in %)	3.33	Appendix XV
<i>Natural environment</i>	Biodiversity	Green space as share of total area (in %)	3.41	Appendix XVII

APPENDIX V - TABLE SHOWING THE VALUES OF THE OBJECTIVE INDICATORS FOR WOODVALE AND THEIR RELATIVE VALUE COMPARED TO BELFAST

POLICY AREA	INDICATOR	MEASURE	VALUE	BELFAST (REFERENCE VALUE)	ANDERSONSTOWN COMPARED TO BELFAST		
					BETTER	EQUAL (WITHIN 10%)	WORSE
Crime and safety	Rates of crime against the person	Per 100.000 persons	5336	4140			
	Property crime rates	Per 100.000 persons	4727	5991			
	Rates of family violence	Per 100.000 persons	6676	2953			
Housing	Housing affordability	Mean value	54524	120389			
	Population density	Persons per square km	7200	2503			
Education	Access to government primary schools	Per 100.000 persons	48.73	34.78			
	Access to government secondary schools	Per 100.000 persons	0	11.82			
	Long term unemployment	Share of total unemployed	41.00	29.25			
Employment and income	Unemployment rate	Share of population	7.20	3.29			
	Access to jobs	Per 100.000 persons	23103	78333			
	Access to emergency centres	Mean travel time in minutes	3.00	5.53			
Transport	Road traffic fatalities	Per 100.000 persons	0	1.05			
	Road traffic injuries	Per 100.000 persons	737	748			
	Household car ownership	Per 100.000 persons	30923	46882			

APPENDIX VI - OVERVIEW OF THE RESULTS OF THE GIS-RESEARCHES OF WOODVALE

POLICY AREA	INDICATOR	MEASURE	VALUE	APPENDIX
<i>Transport</i>	Access to public transport	Share of area within 400m of a bus stop or within 800m of a train station (in %)	100	
		Share of area within 200m of a bus stop or within 400m of a train station (in %)	82.15	Appendix X
<i>Food and other local goods</i>	Density of fast food restaurants	Share of area within 1600m of a fast food restaurant (in %)	100	
		Share of area within 800m of a fast food restaurant (in %)	100	
		Share of area within 400m of a fast food restaurant (in %)	90.50	Appendix XII
	Proximity of healthy food	Share of area within 1600m of a healthy food store (in %)	100	
		Share of area within 800m of a healthy food store (in %)	100	
		Share of area within 400m of a healthy food store (in %)	79.88	Appendix XIV
<i>Public open space</i>	Amount of public open space	Share of total area (in %)	17.03	Appendix XVI
<i>Natural environment</i>	Biodiversity	Green space as share of total area (in %)	13.33	Appendix XVIII

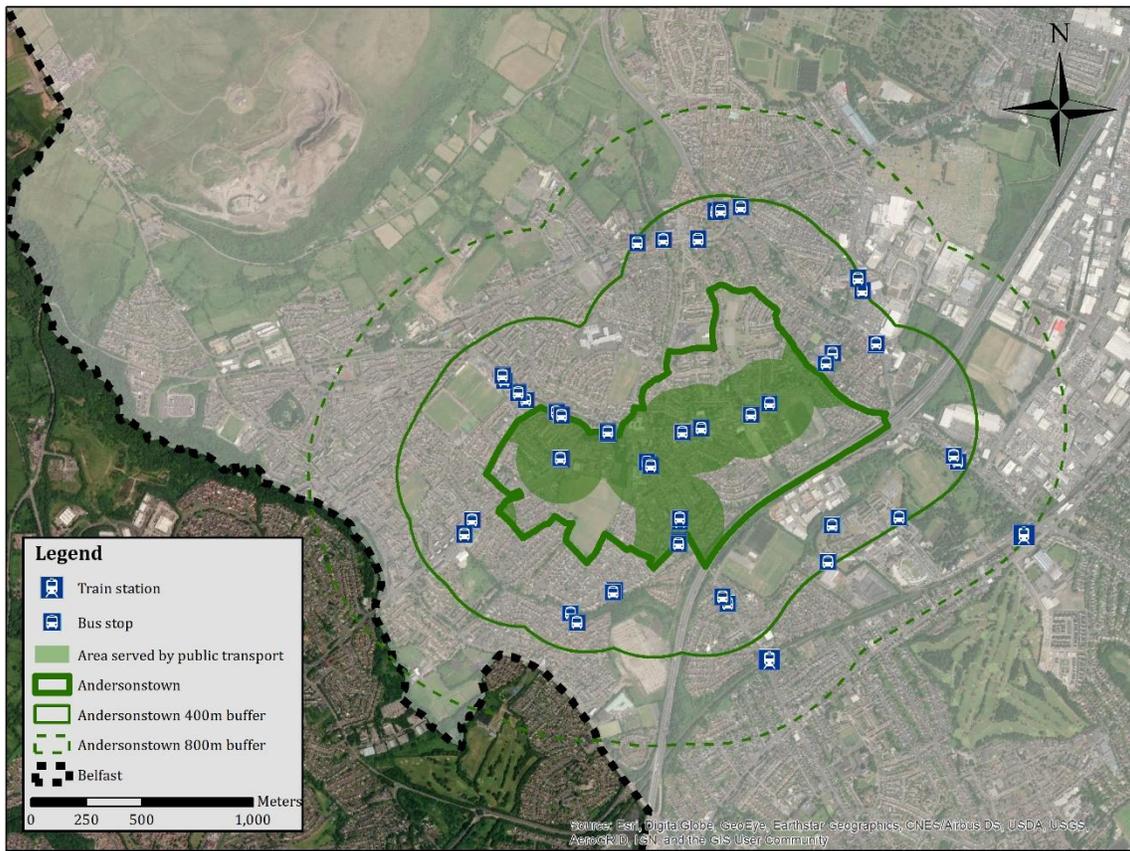
APPENDIX VII – OVERVIEW OF THE OUTCOMES FOR THE SURVEY OF ANDERSONSTOWN

POLICY AREA	INDICATOR	Very unsatisfied		Unsatisfied		Neutral		Satisfied		Very satisfied		Total (n)
			in%		in%		in%		in%		in%	
Crime and safety	Perception of personal safety	0	0.00	2	11.11	1	5.56	8	44.44	7	38.89	18
	Perception of safety of public spaces	1	5.56	0	0.00	4	22.22	8	44.44	5	27.78	18
Education	Pedestrian access to school	1	6.67	1	6.67	3	20.00	4	26.67	6	40.00	15
Employment and income	Variety of jobs	1	5.88	1	5.88	8	47.06	4	23.53	3	17.65	17
Health and social services	Self-reported health	1	5.56	1	5.56	2	11.11	7	38.89	7	38.89	18
	Subjective wellbeing	1	5.56	0	0.00	2	11.11	6	33.33	9	50.00	18
Transport	Traffic noise	3	16.67	4	22.22	2	11.11	5	27.78	4	22.22	18
Public open space	Variety of public space	4	22.22	6	33.33	2	11.11	3	16.67	3	16.67	18
	Access to play areas	3	16.67	5	27.78	4	22.22	1	5.56	5	27.78	18
	Perception of quality of open space	0	0.00	6	33.33	6	33.33	3	16.67	3	16.67	18
Social cohesion and local democracy	Opportunities to have a say on important issues	4	22.22	3	16.67	5	27.78	3	16.67	3	16.67	18
	Feeling part of your community	2	11.11	0	0.00	6	33.33	5	27.78	5	27.78	18
	Social supports	3	17.65	2	11.76	5	29.41	2	11.76	5	29.41	17
	Community acceptance of diverse culture	1	5.56	4	22.22	2	11.11	5	27.78	6	33.33	18
Leisure and culture	Amount of entertainment venues	3	16.67	3	16.67	6	33.33	3	16.67	3	16.67	18
	Variety of entertainment venues	4	22.22	4	22.22	4	22.22	2	11.11	4	22.22	18
	Number of sports and leisure clubs	1	5.56	2	11.11	1	5.56	8	44.44	6	33.33	18
Food and other local goods	Urban agriculture	3	18.75	2	12.50	5	31.25	1	6.25	5	31.25	16
Natural environment	Air quality	6	33.33	2	11.11	4	22.22	4	22.22	2	11.11	18

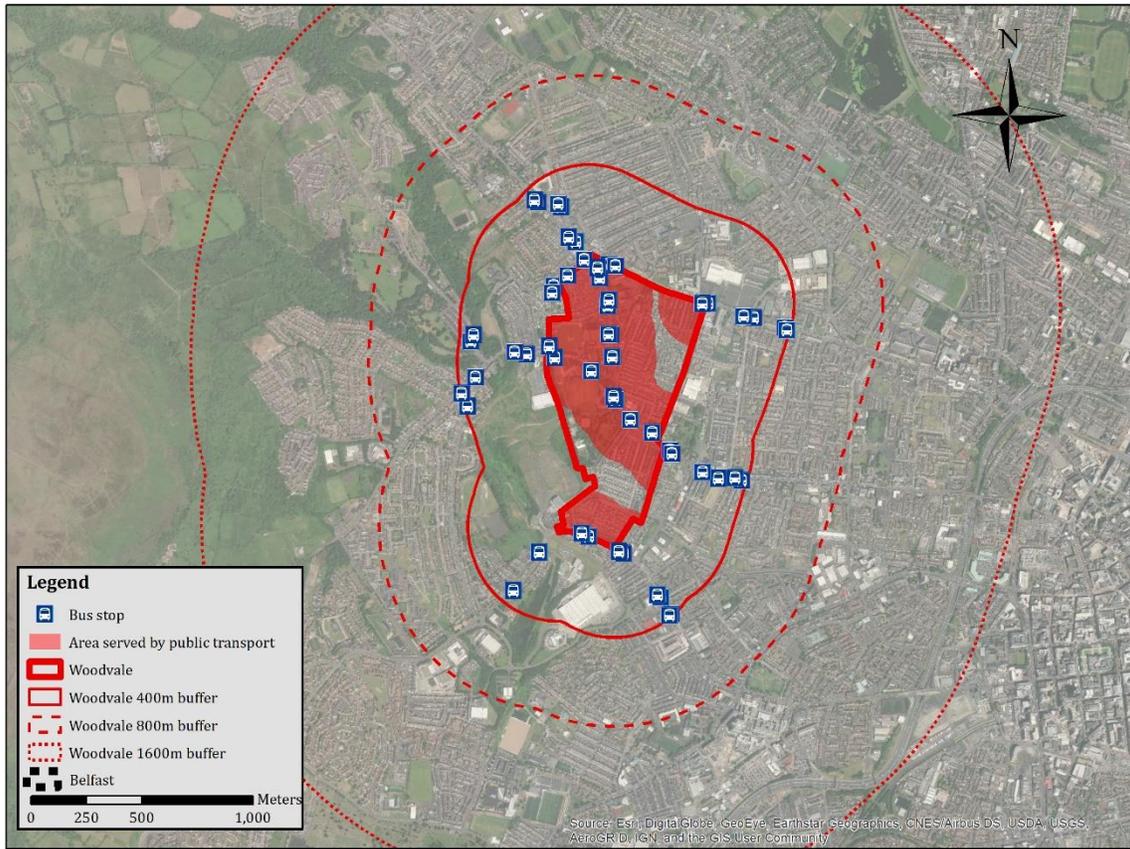
APPENDIX VIII - OVERVIEW OF THE OUTCOMES FOR THE SURVEY OF WOODVALE

POLICY AREA	INDICATOR	Very unsatisfied		Unsatisfied		Neutral		Satisfied		Very satisfied		Total (n)
		n	in%	n	in%	n	in%	n	in%	n	in%	
Crime and safety	Perception of personal safety	3	9.38	6	18.75	10	31.25	11	34.38	2	6.25	32
	Perception of safety of public spaces	7	21.88	12	37.50	10	31.25	1	3.13	2	6.25	32
Education	Pedestrian access to school	9	32.14	9	32.14	3	10.71	5	17.86	2	7.14	28
Employment and income	Variety of jobs	14	45.16	11	35.48	3	9.68	2	6.45	1	3.23	31
Health and social services	Self-reported health	9	29.03	8	25.81	9	29.03	5	16.13	0	0.00	31
	Subjective wellbeing	10	33.33	6	20.00	7	23.33	7	23.33	0	0.00	30
Transport	Traffic noise	9	30.00	4	13.33	14	46.67	2	6.67	1	3.33	30
Public open space	Variety of public space	17	54.84	4	12.90	7	22.58	3	9.68	0	0.00	31
	Access to play areas	14	48.28	3	10.34	8	27.59	3	10.34	1	3.45	29
	Perception of quality of open space	14	46.67	4	13.33	6	20.00	5	16.67	1	3.33	30
Social cohesion and local democracy	Opportunities to have a say on important issues	15	46.88	8	25.00	8	25.00	1	3.13	0	0.00	32
	Feeling part of your community	10	32.26	5	16.13	8	25.81	5	16.13	3	9.68	31
	Social supports	12	38.71	5	16.13	8	25.81	6	19.35	0	0.00	31
	Community acceptance of diverse culture	12	41.38	2	6.90	13	44.83	1	3.45	1	3.45	29
Leisure and culture	Amount of entertainment venues	13	41.94	7	22.58	7	22.58	3	9.68	1	3.23	31
	Variety of entertainment venues	14	46.67	10	33.33	6	20.00	0	0.00	0	0.00	30
	Number of sports and leisure clubs	11	34.38	7	21.88	3	9.38	9	28.13	2	6.25	32
Food and other local goods	Urban agriculture	12	38.71	3	9.68	14	45.16	2	6.45	0	0.00	31
Natural environment	Air quality	14	43.75	4	12.50	9	28.13	5	15.63	0	0.00	32

APPENDIX IX – PUBLIC TRANSPORT ANDERSONSTOWN



APPENDIX X – PUBLIC TRANSPORT WOODVALE



APPENDIX XI – FAST FOOD RESTAURANTS ANDERSONSTOWN



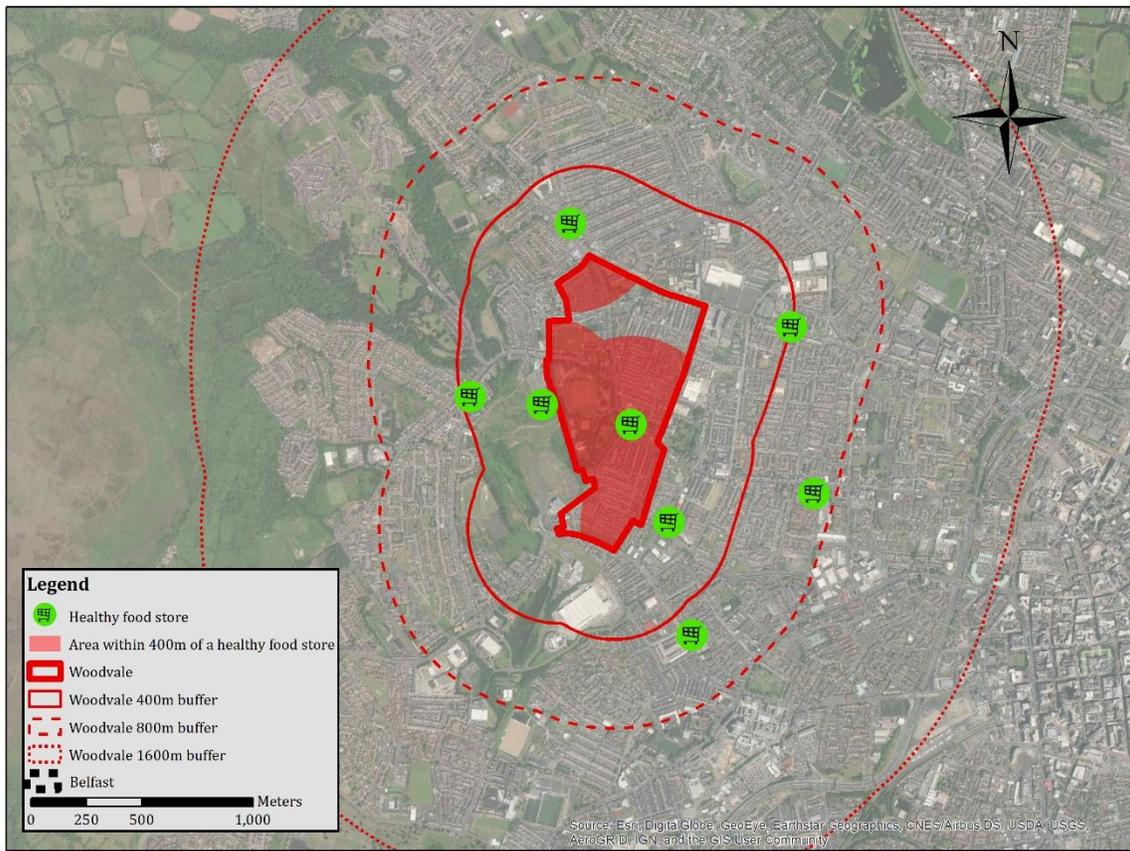
APPENDIX XII – FAST FOOD RESTAURANTS WOODVALE



APPENDIX XIII – HEALTHY FOOD STORES ANDERSONSTOWN



APPENDIX XIV – HEALTHY FOOD STORES WOODVALE



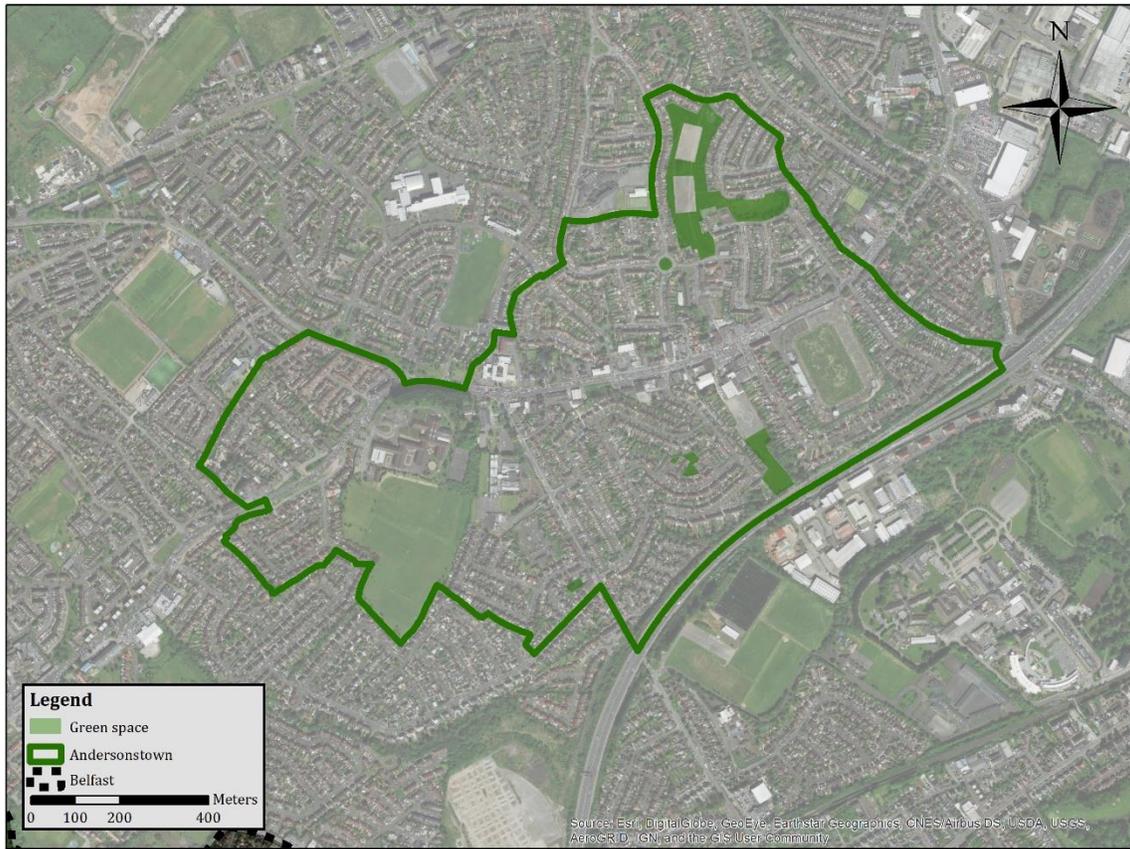
APPENDIX XV – PUBLIC OPEN SPACE ANDERSONSTOWN



APPENDIX XVI – PUBLIC OPEN SPACE WOODVALE



APPENDIX XVII – GREEN SPACE ANDERSONSTOWN



APPENDIX XVIII – GREEN SPACE WOODVALE

