



CHALMERS
UNIVERSITY OF TECHNOLOGY



Managing urban development based on human wellbeing

Master's Thesis in the Master's Programme International Project Management

Christopher Wisting

Department of Architecture and Civil Engineering
Division of Water Environment Technology
Urban Metabolism
CHALMERS UNIVERSITY OF TECHNOLOGY
Master's Thesis BOMX02-17-15
Gothenburg, Sweden 2017

MASTER'S THESIS BOMX02-17-15

Managing urban development based on human wellbeing

Master's Thesis in the Master's Programme International Project Management

Christopher Wisting

Department of Civil and Environmental Engineering

Division of Water Environment Technology

Urban Metabolism

CHALMERS UNIVERSITY OF TECHNOLOGY

Göteborg, Sweden 2017

Managing urban development based on human wellbeing

Master's Thesis in the Master's Programme International Project Management

Christopher Wisting

© Christopher Wisting, 2017

Examensarbete BOMX02-17-15/ Institutionen för bygg- och miljöteknik,
Chalmers tekniska högskola 2017

Department of Civil and Environmental Engineering

Division of Water Environment Technology

Urban Metabolism

Chalmers University of Technology

SE-412 96 Göteborg

Sweden

Telephone: + 46 (0)31-772 1000

Cover:

Urban crowd

Department of Civil and Environmental Engineering Göteborg, Sweden, 2017

Managing urban development based on human wellbeing

Master's thesis in the Master's Programme International Project Management

Christopher Wisting
Department of Civil and Environmental Engineering
Division of Water Environment Technology
Urban Metabolism
Chalmers University of Technology

ABSTRACT

The ongoing urbanisation trend have resulted in a consistent increase of inhabitants in cities around the globe. At the same time, the overall human health and wellbeing is decreasing. With these facts in mind, this thesis aims to create a framework which can measure how well urban areas provide their inhabitants with the conditions for good wellbeing. Such a measurement can thereby highlight aspects in a city that need to be enhanced, hence creating value to the urban development process and aid in decision- and policymaking. Initially, a desktop research described theories of human needs and wellbeing as well as identified existing measurement frameworks. From that research, a suggested measurement framework was developed based on the fundamental human needs theory. It consists of 36 indicators, some of which are taken from the existing frameworks and some which are newly developed, meant to measure the satisfiers of the needs. In order to demonstrate the applicability of the suggested framework, a case study for Gothenburg in Sweden was conducted. Information for the indicators was mainly collected from databases. The outcome of the case study generated information about the development of seven satisfiers which are connected to one need. From these observed developments, it is possible to identify three areas in need of improvement in the city; the situation on the labour market, the health system and the voter turnout. Suggestions on how these areas can be improved are given, which ultimately demonstrates that this type of wellbeing measurement framework can be used as a basis for urban development processes.

Key words: urban development, wellbeing, human needs, measurement framework

Contents

1	INTRODUCTION	1
1.1	Background	1
1.2	Aim of the thesis	2
1.3	Scope	2
1.4	Research questions	2
2	LITERATURE REVIEW	3
2.1	Wellbeing theories	3
2.1.1	Wellbeing definition	3
2.1.2	Maslow's hierarchy of needs	4
2.1.3	The ERG theory	4
2.1.4	Fundamental human needs	5
2.1.5	Subjective wellbeing	6
2.1.6	Evaluation of the theories	7
2.2	How to measure wellbeing	8
2.2.1	OECD wellbeing framework	8
2.2.2	The capabilities approach and Human Development Index	10
2.2.3	Genuine Progress Indicator	11
2.2.4	Satisfaction With Life Scale	12
3	METHOD	13
4	RESULTS AND DISCUSSION	16
4.1	Overview of the final list of indicators	16
4.2	Gothenburg case study	18
4.2.1	Social security	19
4.2.2	Family	20
4.2.3	Health systems	20
4.2.4	Work	21
4.2.5	Insurance systems	22
4.2.6	Rights	22
4.2.7	Savings	23
4.2.8	Connections between the indicators	23
4.2.9	The reliability of the indicators	24
4.3	Using the outcome for managing city development	24
5	CONCLUSION	26
6	REFERENCES	27

Preface

I want to acknowledge that even though I am the sole author of this thesis, I could not have completed it without the aid and support of my supervisor Leonardo Rosado. From the early stages of the process, throughout the shaping of the work and until its completion Leonardo helped me with inspiration, second opinions and valuable insights.

The idea for the topic of this thesis emerged from the ambition of finding a new perspective on what a sustainable city is. Ultimately, it puts the individual in the centre and focuses on the inhabitants' possibilities to achieve a good wellbeing. This approach naturally concerns the social aspect of sustainable development directly, but it also includes the environmental and economic aspect indirectly. This comprehensiveness is what I think makes this topic fascinating and intriguing to study.

Enjoy your reading!

Göteborg, June 2017

Christopher Wisting

1 Introduction

Since 2008 a majority of the world's population live in urban areas. Current predictions estimate that the urbanisation trend will continue to grow and by the year 2050 cities will inhabit almost 70% of the global population (UN, 2015). This trend generates new and complex environmental, economic and social challenges which need to be addressed in order to create a sustainable development. Along with growing urban areas there have also been documented increases in human health issues, both physical and mental (Kinver, 2014). These observations highlight the need to understand the correlation between urban lifestyles and human wellbeing. Urban development processes are therefore facing many important challenges, and the management of the processes is an essential task where these correlations can help decision-makers motivate their choices and therefore should be taken into consideration (OECD, 2015).

Research on how wellbeing can be identified and measured on a national and regional level have been conducted by both scientists and organisations (OECD, 2015; Anielski, 2001), but there are still some unanswered question regarding wellbeing on the urban level. These insights, in combination with the consequences of the urbanisation trend, implies that there is a need to identify urban wellbeing in order to achieve a sustainable development.

1.1 Background

The concept of sustainable development was first introduced in the report *Our Common future*, which was published by the World Commission on Environment and Development (WCED) in 1987. The report was sponsored by the United Nations (UN) and created the definition of sustainable development as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (WCED pg. 36, 1987).

In addition to the definition, the concept of sustainable development consists of three dimensions; the social, the environmental and the economic. The social dimension refers to the right for a dignified life for every human being in the world. It includes aspects such as standard of living, social protection systems, basic services access and clean, healthy and productive societies. Achieving inclusive prosperity within the limits of the world's ecological boundaries is connected to the environmental dimension of sustainable development. Managing the world's finite resources responsibly, decrease waste and mitigate climate change are aspects within this dimension. The economic dimension can be described as the balance between financial prosperity, environmental protection and social development. It refers to investments needed in order to produce and ensure social-, environmental-, and economic capital both for the present and for the future. These three dimensions correlate and affect each other and therefore they need to be managed with an integrated approach for a sustainable development to be achieved (unep.org, 2015).

In the effort of achieving a sustainable development, the UN created the “17 Sustainable Development Goals” (SDGs) which was adopted by world leaders in September 2015. These goals are supposed to be a guideline for all countries worldwide until 2030 and they address issues from all three dimensions of sustainable development, where individual wellbeing is one important parameter among others (un.org, 2017). Furthermore, the SDGs *highlight the importance of finding new ways to secure and improve wellbeing here and now, without placing at risk our children’s chances to enjoy wellbeing later* (OCED, 2015).

Since achieving sustainable development *requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life* (WCED, 1987), the wellbeing of people should be considered as an essential element of it, affecting all three dimensions.

1.2 Aim of the thesis

The aim of this thesis is to show if and how wellbeing measurement frameworks can be used as a basis for urban development processes and aid in decision- and policymaking.

1.3 Scope

The measurement framework suggested in this thesis will focus on the urban level in order to be more applicable. Furthermore, it will be designed based on the characteristics of a western society.

1.4 Research questions

1. Do any existing wellbeing measurement framework cover all human needs?
2. Which indicators should be included in a measurement framework in order to properly assess wellbeing at an urban level?
3. In which ways can a wellbeing measurement aid in urban development processes?

2 Literature Review

There are many different theories regarding what wellbeing is and how it should be approached, which has resulted in many papers about the subject that tries to define and measure it. Therefore, there is not one single, generally accepted and used definition of wellbeing, but instead almost every institute, organisation or national government has created their own. Although these definitions are not identical, the intentional meaning behind them are all practically the same.

This chapter aims to initially highlight some of the most common wellbeing definitions and summarise the content of them in order to clarify what wellbeing is. Thereafter, theories about human behaviour and wellbeing will be explained, followed by descriptions of developed methods for measuring wellbeing.

2.1 Wellbeing theories

In order to be able to develop and enhance the policies that creates the conditions for better lives of a country's inhabitants, a good understanding of people's wellbeing is essential (OECD, 2015). In this section, some wellbeing definitions will be presented. Furthermore, theories regarding human behaviour and wellbeing are described.

2.1.1 Wellbeing definition

In the book, *How's Life?* published by the Organisation for Economic Co-operation and Development (OECD), wellbeing is defined as a multidimensional state-of-mind, covering several different aspects of life. The combination and interaction between these aspects determine the perceived well-being of an individual (OECD, 2015). This definition is further supported by other organisations such as the International Council for Science (iscu.org, 2017).

According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO), wellbeing is "a state of successful performance throughout the life course integrating physical, cognitive and social-emotional function that results in productive activities deemed significant by one's cultural community, fulfilling social relationships and the ability to transcend moderate physiological and environmental problems. Wellbeing also has a subjective dimension in the sense of satisfaction associated with fulfilling one's potential" (Pollard and Davidson, 2001 pg. 10). Highlighted in this definition is the ecological approach to wellbeing as well as its subjective nature.

Another definition of wellbeing has been created by the Centres for Disease Control and Prevention (CDC). They state that wellbeing is "a dynamic and relative state where one maximizes his or her physical, mental, and social functioning in the context of supportive environments to live a full, satisfying and productive life" (Kobau et. al, 2010 pg. 274). CDC's concept of wellbeing corresponds with the World Health Organisation's definition of health and it also includes an ecological perspective, considering human's relationship to the environment (Kobau et. al, 2010).

2.1.2 Maslow's hierarchy of needs

One of the most common human behavioural theories is Maslow's theory of the hierarchy of needs (1954). In the theory, Maslow presents a model consisting of five basic human needs in an ascending hierarchical order. They are physiological needs, safety needs, love needs, esteem needs and the need for self-actualisation. The lowest level of the hierarchy is the physiological needs which are the basic requirements for human survival, such as air, water, food, clothes and shelter. The safety needs mainly refer to security regarding personal economics and mental and physical health. The need for love could be explained as a feeling of belongingness. Humans want to be a part of a group, such as family, social clubs, co-workers, sport-teams and religious groups. To feel love towards and being loved by the members of these groups are also included in this need. The esteem needs are derived from the human desire to be accepted and valued by other individuals. This desire can be achieved in various ways, for example through recognition from a profession or a hobby. The need for self-actualisation is the highest level of Maslow's hierarchy and can be described as the realisation of a person's full potential, to become the most that one can be. The order of these needs is determined by their importance towards personal survival and individual motivation, so once a lower level need is satisfied people strive for the next need in the hierarchy.

2.1.3 The ERG theory

Clayton Alderfer (1972) created a theory which further develops Maslow's hierarchy of needs. This theory is called the ERG theory and categorises Maslow's five needs into three groups: Existence, Relatedness and Growth. The existence category concerns the human strive of obtaining the requirements for basic materialistic existence, thereby it consists of Maslow's physiological and safety needs. The needs for love and external self-esteem belong in the relatedness category of the ERG theory. Interactions and interpersonal relationships are required in order to satisfy this category. The last category, growth, highlight the desire of personal development and includes Maslow's needs for external self-esteem and self-actualisation. These categories are not generally sorted in any specific order, contrarily to Maslow's theory, and the importance of them may vary between individuals. Therefore, it is not effective to focus on solely one need but instead the satisfaction of multiple needs should be simultaneously strived towards (Alderfer, 1972).

The ERG theory includes one more important component. If an individual is unable to satisfy a higher-level need, that person will invest more energy into a lower need. This phenomenon is called the regression principle and it can, according to Alderfer, to some extent explain human behaviour (Alderfer, 1972).

2.1.4 Fundamental human needs

In difference with Maslow's theory, Manfred Max-Neef et al. (1992) states that human needs should be interpreted as an interrelating and interactive system. According to Max-Neef, needs are finite and constant, it is only the means by which the needs are satisfied that changes across cultures and through time. Thereby trade-offs, simultaneity and complementarity characterises the process of needs satisfaction. Initially, human needs are organised into two categories: existential and axiological. By this division, nine fundamental needs have been classified by Max-Neef as; subsistence, protection, affection, understanding, participation, leisure, creation, identity and freedom. With subsistence (to remain alive) as the only exception, these needs are not structured in a hierarchy. As the next step, these axiological needs are compiled with four existential needs: being, having, doing and interacting. Their interactions are demonstrated in a matrix consisting of 36 cells (or dimensions) as described in Table 1. The *Being* column explains personal or collective attributes. These are expressed as nouns. The *having* column include functions such as laws, mechanisms, norms and non-material tools among others. Personal or collective actions belong to the *doing* column and are expressed as verbs. The *interacting* column explains locations in terms of times and spaces (Max-Neef et al., 1992).

Table 1 - Table of needs and satisfiers (Max-Neef et. al, 1992)

	Being	Having	Doing	Interacting
Subsistence	<i>Physical and mental health, equilibrium, sense of humour, adaptability</i>	<i>Food, shelter and work</i>	<i>Feed, procreate, work and rest</i>	<i>Living environment and social setting</i>
Protection	<i>Care, adaptability, autonomy, equilibrium, solidarity</i>	<i>Social security, family, health systems, work</i>	<i>Co-operate, prevent, plan, help, take care of</i>	<i>Living space, social environment</i>
Affection	<i>Self-esteem, respect, generosity, passion, sensuality, sense of humour, solidarity, tolerance, receptiveness, determination, sensuality</i>	<i>Friendships, family, relationship with nature</i>	<i>Take care of, express emotions, share, make love, appreciate</i>	<i>Privacy, intimacy, home</i>
Understanding	<i>Receptiveness, curiosity, astonishment, discipline, intuition, rationality, critical conscience</i>	<i>Literature, teachers, educational and communicational policies</i>	<i>Investigate, study, experiment, educate, analyse, meditate</i>	<i>Settings of formative interactions, schools, universities, academies, communities, family</i>
Participation	<i>Adaptability, receptiveness, solidarity, willingness, determination, respect, passion, sense of humour, dedication</i>	<i>Rights, responsibilities, duties, privileges, work</i>	<i>Become affiliated, co-operate, propose, share, dissent, obey, interact, agree on, express opinions</i>	<i>Settings of participative interactions, associations, communities, family</i>
Leisure	<i>Curiosity, receptiveness, imagination, sensuality, sense of humour</i>	<i>Games, spectacles, clubs, parties, peace of mind</i>	<i>Day-dream, recall old times, fantasies, relax, have fun</i>	<i>Free time, privacy, intimacy, spaces of closeness, surroundings, landscapes</i>

Creation	<i>Passion, determination, imagination, curiosity, rationality, inventiveness, autonomy, intuition, boldness</i>	<i>Abilities, skills, method, work</i>	<i>Work, invent, build, design, compose, interpret</i>	<i>Productive and feedback settings, workshops, audiences, spaces for expressions, temporal freedom</i>
Identity	<i>Sense of belonging, self-esteem, consistency, differentiation, assertiveness</i>	<i>Symbols, language, religions, habits, customs, reference groups, values, sexuality, norms, work</i>	<i>Commit oneself, integrate oneself, confront, decide on, recognise oneself, grow</i>	<i>Settings which one belongs to, everyday settings, social rhythms</i>
Freedom	<i>Self-esteem, autonomy, passion, determination, tolerance, rebelliousness, assertiveness, open-mindedness, boldness</i>	<i>Equal rights</i>	<i>Dissent, choose, be different from, disobey, develop awareness</i>	<i>Temporal and spatial plasticity</i>

The needs and satisfiers do not have a one-to-one interaction. A need can require several satisfiers in order to be met, and at the same one satisfier can simultaneously contribute to the satisfaction of various needs. Therefore, it is motivated that the fundamental human needs are the same on a global scale. Max-Neef further argue that the choice of satisfiers is one aspect which determine a society's culture. A cultural change is thereby the effect of new satisfiers being pursued whilst traditional ones are dropped.

2.1.5 Subjective wellbeing

"Everyone is different" is a commonly used phrase which emphasises that all individuals are unique. In this spirit, Diener et. al (1999) argues that people react differently to the same circumstances, making the subjective element an essential part of wellbeing. The subjective form of wellbeing has been explained by Shin and Johnson (1978), as presented in Diener et. al (1984), as "a global assessment of a person's quality of life according to his or her own chosen criteria" (pg. 543). Although several other explanations exist, this one shows their aggregated meanings.

Diener et. al (1984) further describes that subjective wellbeing have three attributes. It is subjective, meaning that it is based on the individual's own experiences. It includes positive measures, not only negative ones. And it includes a global assessment of all aspects of a person's life. Other than these attributes, Diener et. al (1999) state that subjective wellbeing consists of a set of components which should be researched and investigated separately in order to understand the subject. Based from the components, some sub-divisions of subjective wellbeing are identified as shown in Table 2.

Table 2 - Components of subjective wellbeing (Diener et. al, 1999)

Pleasant affects	Unpleasant affects	Life satisfaction	Domain satisfactions
Joy	Guilt and shame	Desire to change life	Work
Elation	Sadness	Satisfaction with current life	Family
Contentment	Anxiety and worry		Leisure
Pride	Anger	Satisfaction with past	Health
Affection	Stress	Satisfaction with future	Finances
Happiness	Depression	Significant other's views of one's life	Self
Ecstasy	Envy		One's group

2.1.6 Evaluation of the theories

Almost all wellbeing definitions highlight its multidimensional nature, stating that it is a consequence of a combination of interacting aspects and functions (OECD, 2015; Pollard and Davidson, 2001). These definitions thereby support and connect to the ideas behind the ERG theory and the theory regarding Fundamental human needs (Alderfer, 1972; Max-Neef et al., 1992). Since both these theories are derived from Maslow's hierarchy of needs (1954), that theory is not entirely irrelevant but, with the physiological needs as the only exception, human needs should not be perceived as levels or steps in the context of understanding wellbeing. Although Maslow's five needs have been developed and expanded over time, he was the first researcher to identify them. Max-Neef et al. (1992) even argues that the needs are finite and constant all around the globe and that it is just the choices of satisfiers that differ among countries and cultures. Moreover, besides Diener et al. (1984; 1999) the subjective element of wellbeing has been identified in several definitions (Pollard and Davidson, 2001; Kobau et al., 2010). The ERG theory discusses this element and highlight it as an important feature which could explain human behaviour (Alderfer, 1992). The theory of Fundamental human needs fail to mention individual differentiation regarding human needs satisfaction, but instead focuses on the cultural differences (Max-Neef et al., 1992). An important notion though is that both these theories argue that differences across the globe regarding wellbeing values may, and will most likely occur.

Comparing the above-mentioned theories with the available definitions of wellbeing, it is clear that the ideas behind Fundamental human needs are the most developed and relevant ones. Max-Neef et al. (1992) argues that needs are not structured in a hierarchy, but instead interacts with each other in an interrelating system. This argument corresponds with the definitions of wellbeing. Thereby, the needs and satisfiers presented by Max-Neef et al. (1992) could create a basis for identifying which indicators that should be used to measure wellbeing. With the aim of this thesis in mind, it will be enough to consider the *Having* needs in this process, thereby excluding the *Being*, *Doing* and *Interacting* categories. The first one is the most significant and can possibly generate enough wellbeing indicators into a measurement framework without mitigating the reliability of the outcome.

2.2 How to measure wellbeing

Traditionally, measuring a country's gross domestic product (GDP) per capita was used as a sole indicator for how good it's inhabitants' wellbeing was. This method however, has during the recent years been considered as inadequate and misleading since a lot of aspects are not taken into consideration (Wen et al., 2007; Anielski, 2001; Hamilton and Saddler, 1997). In fact, the wellbeing of two countries can differ considerably even though they have the same GDP per capita (OECD, 2015).

2.2.1 OECD wellbeing framework

The aim of *How's Life?* (OECD, 2015) is to promote "better policies for better lives" through measuring the wellbeing of individuals. In this effort, a framework was created. It was initially introduced by the OECD in 2011 and consist of a broad set of metrics aimed to measure the process of societies. Statistics from national and international initiatives was used as input to the framework. As presented in Figure 1, the framework includes eleven factors or dimensions divided into two groups, material conditions and quality of life. The "material conditions" group consist of the dimensions *income and wealth*, *jobs and earnings* and *housing*. The dimensions belonging to the "quality of life" group are *health status*, *work-life balance*, *education and skills*, *social connections*, *civic engagement and governance*, *environmental quality*, *personal security* and *subjective wellbeing*. Included into these eleven dimensions are 24 indicators which are used to conduct the actual measurement of the framework (OECD, 2015).

One important feature of the framework is to not only measure wellbeing development overall, but also to show whose life is getting better. This means that there are distinctions between men and women, older and younger people, higher and lower income groups and people of different levels of education. Furthermore, the framework considers the resources, or capital, existing in countries. This refers to the amount of natural, human, economic and social capital there is available and which together creates the foundation for, and supports, wellbeing outcome over time (OECD, 2015).

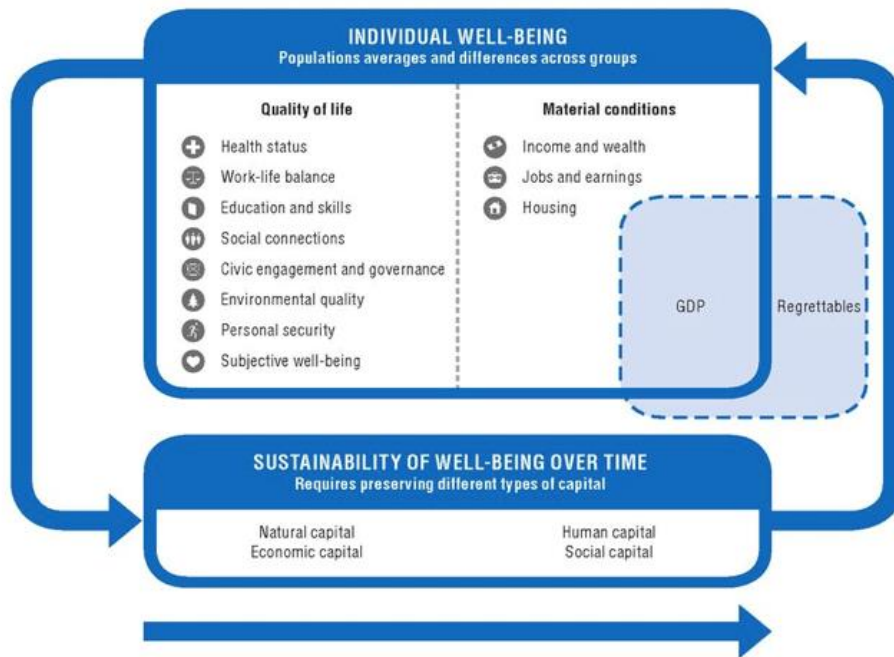


Figure 1 - The OECD framework for measuring wellbeing (OECD, 2015)

As described above, the OECD framework aim to establish for whom life is getting better. In order to achieve this aim, individuals and households are put in the centre of the assessment, focusing on their perception and experiences of wellbeing. Moreover, the wellbeing outcomes are highlighted in the framework instead of the inputs and outputs used to deliver those outcomes. It is important to keep in mind that these outcomes have both an objective side and a subjective side. Both these sides, along with the distribution of wellbeing across the distinctions of people, need to be recognised in the assessment for a realistic measurement to be conducted (OECD, 2015).

Moreover, the OECD (2015) highlight the need of conducting local-area measurements of wellbeing since national averages may mask regional variances within a country. Evidence show that local circumstances, such as environment, access to public services and well-functioning infrastructure, are important elements that shape the wellbeing of the people living in the area. By performing wellbeing measurements on a smaller scale, it is possible for a local government to set up effective policies to meet the challenges a certain region faces (Anielski, 2001; OECD, 2015). The regional measurement framework suggested in *How's Life?* consists of 9 dimensions which are almost the same as the ones presented in figure 1. The dimensions not accounted for at a regional level are *social connections*, *work-life balance* and *subjective wellbeing*. Instead a new dimension is added, *accessibility to services* (OECD, 2015). These nine dimensions include 24 indicators

With the two above mentioned measurement frameworks, it will be possible to determine and pinpoint the wellbeing of a country's inhabitants and creating suitable, local-specific policies which can make their lives better. But in order for these frameworks to be realistic and properly applicable, citizen participation in the execution of the measurements, and sometimes even in the development of some of the measured indicators (Anielski, 2001), is vital. In addition to making

the measurement outcomes more reliable, it empowers citizens. Their trust in the local government may be strengthened if policies that meet their needs and expectations are implemented (OECD, 2015). Finally, it needs to be highlighted that the OECD framework lacks critical reviews regarding how reliable and truthful it is on a national level.

2.2.2 The capabilities approach and Human Development Index

As described by Kuklys (2005) in the book *Amartya Sen's capability approach: theoretical insights and empirical applications*, the capability approach is a framework aimed to evaluate an individual's welfare. The framework was created by the French scientist Amartya Sen who had identified the limitations of only using GDP per capita when comparing the development of countries. Therefore, the capability approach assesses a person's welfare by focusing on his or her functionings and capabilities. With functionings Sen refers to what a person is, manages to and achieve. In other words, functionings are a person's activities and state of being, i.e. being educated, being employed, being healthy or moving about freely. Capabilities are defined by Sen as the functionings that a person potentially can achieve in the future. Thereby it involves a person's freedom of choice for his or her life. With these two components, the capability approach describes welfare on two levels: one of realised welfare, measured and evaluated by functionings, and one of potential welfare, measured by capabilities (Kuklys, 2005).

The basic idea of Sen's capability approach has, since 1990, been adopted and used for the Human Development Index (HDI), which is a measurement tool created by the UN (Kuklys, 2005). The HDI is another attempt to go beyond the traditional GDP per capita indicator when identifying a country's development. It includes and analyses three dimensions: health, education and standard of living. Life expectancy at birth is used as an indicator to measure the health dimension. To measure the education dimension, mean of years of schooling for adults aged 25 or more is used along with expected years of schooling for children yet to enter school. Lastly, the gross national income per capita (GNI) is used to measure the standard of the living dimension. When these three dimensions have been assessed, the results are aggregated into the HDI of a country which then can be used to conduct broader comparisons of the development of countries. Furthermore, the HDI can identify and question the effects of national policies by showing different development outcomes of countries with the same level of GDP and GNI (undp.org, 2017).

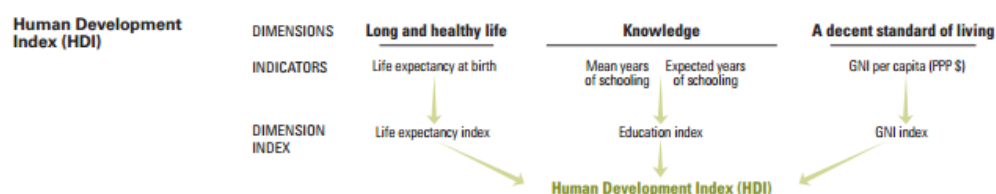


Figure 2 - Human Development Index (undp.org, 2017)

As an attempted improvement of the GDP, the HDI fulfils its purpose. But like the GDP, the HDI is limited regarding measuring the realistic wellbeing of a country's

inhabitants. The main reason for this limitation is the lack of environmental indicators in the HDI's calculation. As a consequence, the structure of the HDI could be considered to be biased (EL-Din, 2005).

2.2.3 Genuine Progress Indicator

As mentioned earlier in this section, the GDP of a country is traditionally the most frequently used indicator for a country's development and the wellbeing of its inhabitants. One attempt to create a tool which goes beyond the GDP, and better reflect reality, resulted in the Genuine Progress Indicator (GPI). In difference with the GDP, the GPI measures not only economic indicators, but also environmental impacts and social conditions of a nation (Hamilton and Saddler, 1997). It thereby takes into consideration the costs and benefits generated by economic activity, something that is ignored in GDP. The number of indicators that should be included in the GPI have varied over time, mostly because of the differences of availability of data, but generally they are 25 in total. These indicators can either be negative or positive, meaning that they either increase or reduce the value of the GPI. All indicators are valued in monetary terms (Lawn, 2003). Table 3 demonstrates how the GPI calculation is performed and lists the indicators included.

Table 3 - GPI Indicators (Lawn, 2003)

Personal consumption expenditure	+
Index of distributional inequity	+/-
Cost of consumer durables	-
Services yielded by consumer durables	+
Services yielded by publicly provided human-made capital	+
Services yielded by volunteer work	+
Services provided by non-paid housework	+
Cost of noise pollution	-
Cost of commuting	-
Cost of crime	-
Cost of underemployment/unemployment	-
Cost of lost leisure time	-
The cost of household pollution abatement	-
The cost of vehicle accidents	-
The cost of family breakdown	-
Net capital investment	+/-
Net foreign lending/borrowing	+/-
Loss of farmland	-
Cost of resource depletion	-
Cost of ozone depletion	-
Cost of air pollution	-
Cost of water pollution	-
Cost of long-term environmental damage	-
Loss of wetlands	-
Loss of old-growth forests	-
Total = Sum of all indicators = GPI	

Even though the GPI is a significantly better system than the GDP in terms of measuring wellbeing, it still could be improved (Wen et al., 2007; Hamilton and Saddler, 1997). Initially, it has been highlighted by several researchers that some of the indicators included in the GPI, such as cost of pollution and vehicle crashes, are difficult to evaluate and translate into monetary term (Wen et al., 2007; Anielski, 2001). The consequence of this issue, in combination with the risk of a lack of available data, is that some assumptions and approximations may have to be done, mitigating the reliability of the GPI (Anielski, 2001). Moreover, the basic GPI structure in itself do not include qualitative data which are needed to measure the subjective part of wellbeing. Finally, the choices of indicators have, in some previous studies, been observed to be biased since opinions regarding what should be considered important for wellbeing vary. A proposed solution to this problem is to let citizens participate in the development of the GPI and thereby making it possible to identify the local values of wellbeing. Applying this process will create case-to-case adaptations of the system, making it more relevant and applicable for each situation (Anielski, 2001).

2.2.4 Satisfaction With Life Scale

Initially introduced in 1985, the Satisfaction With Life Scale (SWLS) is a multi-item tool used to identify and measure the happiness of individuals. The SWLS is based on the ideas around the concept of subjective wellbeing, meaning that it centres the individuals own judgement regarding the satisfaction criteria they set up for themselves and their lives. It consists of five items, or statements, on which the respondent can answer using a scale of 1-7 where 1 is “strongly disagree” and 7 is “strongly agree” (Diener et. al, 1985). The results from the scale can thereby range between 5-35 where 20 represents a neutral line of the scale. Scores below 20 indicate that an individual is more or less dissatisfied with their life whereas scores above 20 on the other hand indicate that the individuals are satisfied. The SWLS scores has been shown to strongly correlate with measures of mental health, identifying issues of it and predicting future behaviour of individuals. Therefore, it is considered highly applicable in measuring global cognitive judgements on individual life satisfaction (midss.org, 2017; Pavot et al., 1991).

1. In most ways my life is close to my ideal
2. The conditions of my life are excellent
3. I am satisfied with my life
4. So far, I have gotten the important things I want in life
5. If I could live my life over, I would change almost nothing

Figure 3 - SWLS items (Diener et. al, 1985)

3 Method

Initially, a desktop research was performed, through which an issue was observed regarding growing urban populations and decreasing human health and wellbeing (Kinver, 2014). This issue highlighted the potential of using wellbeing measurement as a possible basis for managing urban development and improve the situations in the cities (Anielski, 2001; OECD, 2015).



Figure 4 - Method process overview

As a starting point, the term “wellbeing” was analysed through a desktop research and then its theory and definition could be explained. Moreover, a connection between the wellbeing theories and theories of human needs was observed, hence descriptions about them was considered to be necessary. Through further research, four human needs theories were explained; Maslow’s hierarchy of needs, since it is one of the oldest human behavioural and needs theory (Maslow, 1954), the ERG theory, a further development of Maslow’s theory (Alderfer, 1972), the Fundamental human needs theory (Max-Neef et. al, 1992) and the theory of subjective wellbeing, which highlight the subjective nature and aspect of how people perceive their wellbeing (Diener et. al, 1999). The next step was to select the most relevant theory to use in a measurement framework. The Fundamental human needs theory (Max-Neef et. al, 1992) was observed as the most developed theory and was thereby selected for this purpose.

Table 4 - Description of needs, satisfiers and indicators

Needs	Satisfiers	Indicators
The <i>needs</i> of humans. In the FHN theory there are nine needs.	The things that can fulfil and <i>satisfy</i> the needs.	The <i>indicators</i> are used in order to measure the satisfiers.

Thereafter, existing wellbeing measurement frameworks were researched and explained. The GDP was identified as the simplest and most commonly used tool for measuring a country’s wellbeing (Hamilton and Saddler, 1997). But since the GDP had observed limitations, other frameworks were studied through desktop research. Ultimately, four measurement frameworks were identified and described; OECD’s wellbeing measurement framework (OECD, 2015), the HDI (Kuklys, 2005), the GPI (Lawn, 2003) and the SWLS (Diener et. al, 1985). The first three were all striving to go beyond the GDP and provided a more realistic measurement of a country’s wellbeing and were thereby considered relevant for this thesis.

Once both the measurement frameworks and the human needs theories were selected and described, the next step of connecting them could begin. Initially, the content and meaning of each of the nine fundamental human needs was analysed.

Furthermore, it was decided that only the satisfiers of the *Having* category of the fundamental human needs theory would be used for the suggested measurement framework. After analysing the four categories, that one was considered to be enough in order to fulfil the purpose of the thesis. Moreover, an analysis of all indicators for each of the existing frameworks was performed with the purpose of understanding their origin. By conducting these analyses, it became possible to identify and evaluate which indicators from the frameworks that could be used to measure the satisfiers for all needs. In order to create a coherent method throughout this process, four questions were used for the evaluation of each indicator:

1. Evaluate the indicators with a city perspective
2. Is it directly related to the satisfier and in itself useful? (++)
3. Is it relevant but needs to be adjusted somehow in order to be useful? (+)
4. Is it not relevant or useful at all? (-)

This evaluation process was conducted framework by framework and resulted in three tables describing the outcome. These tables are presented in Appendix A, B and C. Once the indicator evaluation was completed, the process of creating a final list of indicators was initiated. As a first step, it was decided that each indicator should be measured from two aspects, how easy it is to *Access* and how good its *Quality* is. By having these two aspects, it could be ensured that the suggested final list of indicators created a comprehensive framework capable of generating a reliable measurement. As a second step, three new questions were used as a guideline in order to ensure a coherent methodology for all indicators:

1. Can the indicator be used directly? (++)
2. Can it be used directly if it gets adapted? (+)
3. Can it be used indirectly? (+)

If the answer was “no” for all these question, then a new indicator had to be created which could accurately measure the satisfier. When this process was completed, it resulted in a final list of indicators as shown in Table 4.

In order to demonstrate the applicability of the created framework, it was used in a case study. Due to location, size and the availability of data, the city of Gothenburg was chosen for this activity. Early in the process it was decided that only the satisfiers for the Protection need should be included in the case study, since they would generate a well enough result to fulfil the case study’s purpose. Furthermore, the investigated time period was set to examine data between the years 2000-2016 in order to get recent information. To commence, data for all indicators was collected. This activity was conducted by accessing databases from various organisations, but primarily Statistiska Centralbyrån. Surveys and interviews could possibly have increased the information gathered, thus enhancing the analysis of it. However, due to a limitation in time it was decided that the databases could provide good enough information in order to properly perform the case study. In some cases, as discussed in Chapter 4.2, the initially suggested indicators were not possible to apply due to lack of available data. In those cases, new indicators were created. Subsequently, the collected data was analysed indicator by indicator. The analysis was conducted by understanding the

development of the indicators during the investigated timeframe and from the analysed data, trends could be observed. By identifying trends, it was possible to understand the development of the Participation needs and thereby create a basis for deciding which, and how, areas need to be improved in the city.

Finally, it was possible to find and suggest possible measures which can complete the improvements of the Participation needs in Gothenburg. Being able to perform this activity is the ultimate purpose of this thesis and makes it possible to manage urban development based on human wellbeing.

4 Results and discussion

In this chapter of the thesis, the results will be described along with an analysis and discussion. The section is divided into three parts. First, a table with the final list of indicators will be presented together with an overview analysis of it. Second, the Gothenburg case study will be described and discussed, analysing the satisfiers for the Protection need. Third, some examples will be given on how the investigated information can be used for managing the development of a city.

4.1 Overview of the final list of indicators

The results of connecting the theory of fundamental human needs (Max-Neef, 1992) with the various wellbeing measurement frameworks, is presented in Table 4.

Table 5 - Final list of indicators

<u>Needs</u>	<u>Satisfiers</u>	<u>Indicator wish list</u>	<u>Indicators from existing frameworks</u>	<u>Final list of indicators</u>
Subsistence	<i>Food</i>	1. Average % of income spent on food 2. Satisfaction with food and water quality	1. - 2. Satisfaction with water quality +	1. Amount of charity meals handed out per capita 2. Satisfaction with water and food quality (Q)
	<i>Shelter</i>	1. Number of people who does not have a long-term dwelling 2. Dwellings without basic facilities	1. - 2. Dwellings without basic facilities ++	1. Number of people who does not have a long-term dwelling 2. Dwellings without basic facilities
	<i>Work</i>	1. Employment rate 2. Average annual earnings per employee	1. Employment rate ++ 2. Average annual earnings per employee ++	1. Employment rate 2. Average annual earnings per employee
Protection	<i>Social security</i>	1. How large % of the people receive some type of monetary assistance 2. How much government money is spent on social security for people in the city	1. - 2. -	1. % of the population receiving monetary assistance 2. Cost of social security per capita
	<i>Family</i>	1. & 2. How many people feel that they have people who support them (Social network support)	1. & 2. Social network support ++	1. & 2. Social network support (Q)
	<i>Health systems</i>	1. How easy is it for individuals to receive help regarding their health issues 2. Life expectancy at birth	1. - 2. Life expectancy at birth ++	1. Average waiting time to book a doctor appointment 2. Life expectancy at birth
	<i>Work</i>	1. Employment rate 2. % of people with secure jobs	1. Employment rate ++ 2. Employment rate +	1. Success rate of employments through support organisations 2. Secure employment rate
	<i>Insurance systems</i>	1. % of income spent on insurances 2. % of insurance cases which have a positive outcome for the individual	1. GNI per capita + 2. -	1. GNI per capita compared with average insurance costs per capita 2. % of insurance cases with positive outcomes
	<i>Rights</i>	1. & 2. Voter turnout in elections	1. & 2. Voter turnout ++	1. & 2. Voter turnout
	<i>Savings</i>	1. & 2. Average annual earnings per employee	1. & 2. Average annual earnings per employee +	1. & 2. Average annual earnings per employee

Affection	<i>Friendships, Family, Partnership</i>	1. & 2. Social network support	1. & 2. Social network report ++	1. & 2. Social network support (Q)
	<i>Relationship with nature</i>	1. & 2. Access to green spaces	1. & 2. Access to green space ++	1. & 2. Access to green spaces
Understanding	<i>Teachers, Method, Literature</i>	1. Number of students per teacher 2. Number of graduating individuals each year	1. - 2. Competences in adult population ++	1. Number students per teacher 2. Competences in adult population
	<i>Educational and communicational policies</i>	1. How long are students expected to stay in school (years) 2. Competences among the city's inhabitants	1. Expected years of schooling ++ 2. Students' cognitive skills ++	1. Expected years of schooling 2. Students' cognitive skills
Participation	<i>Rights</i>	1. % of employees who are members in a union 2. Voter turnout	1. - 2. Voter turnout ++	1. % of employees who are members in a union 2. Voter turnout
	<i>Responsibilities, Duties, Work</i>	1. & 2. Employment rate	1. & 2. Employment rate ++	1. & 2. Employment rate
	<i>Privileges</i>	1. & 2. What % of the population are members in a club (social, sports, cultural etc.)	1. & 2. -	1. & 2. % of the population who are members in a club (Q)
Leisure	<i>Games, Clubs, Spectacles, Parties</i>	1. What are the possibilities in the city to attend/arrange various fun activities 2. How much free time do people have	1. - 2. Time devoted to personal care and leisure ++	1. Accessibility of leisure activities in the city (Q) 2. Time devoted to personal time and leisure
	<i>Peace of mind</i>	1. & 2. The satisfaction with life	1. & 2. Satisfaction with Life Scale ++	1. & 2. SWLS (Q)
Creation	<i>Abilities, Skills, Method</i>	1. & 2. Number of creative classes (crafts, other) offered in the city per capita	1. & 2. -	1. & 2. Creative classes offered to the people per capita
	<i>Work</i>	1. Number of new companies started per year 2. % of the population who believe that their job allows them to be creative	1. - 2. -	1. Number of new companies started per year 2. % of employees with creative jobs (Q)
Identity	<i>Language, Religions, Habits, Customs, Reference Groups, Sexuality, Values, Norms, Work</i>	1. & 2. % of the population who believe that they have somewhere in the city they can express their personality	1. & 2. -	1. & 2. Accessibility of identity expression (Q)
Freedom	<i>Equal rights</i>	1. Voter turnout 2. Income distribution	1. Voter turnout ++ 2. GINI-Index ++ 2. Index of distributional income equity ++	1. Voter turnout 2. Gini-Index

The final list of indicators is, to a large extent, based on the OECD wellbeing framework (OECD, 2015), but they are complemented with a few indicators from the HDI (undp.org, 2017) as well as the SWLS (Diener et. al, 1985). The only existing measurement framework from which no indicators are used, is the GPI (Lawn, 2003). Most of the indicators from the existing frameworks can be used directly as they provide accurate measurements of the satisfiers. In some cases however, they can only be used indirectly meaning that they need some form of adjustment in order to be applicable. Together, the HDI, SWLS and OECD measurement frameworks cover most of the satisfiers from the fundamental human needs theory but some gaps were identified, resulting in the need for creating new indicators. To ensure the reliability and accuracy of some of the new indicators, data about them should be collected through a survey. This method can be both time consuming and resource demanding but will help to enhance the efficiency of the framework (Alshenqeeti, 2014).

The needs which were most difficult to create indicators for were *Creation* and *Identity*. None of the existing frameworks had considered these needs in an effective way, therefore all new indicators had to be developed. The majority of the needs however, consists of a mix between already existing indicators and new ones. An example are the indicators for the *Work* satisfier to the Subsistence need where *Number of people who does not have a long-term dwelling* is a new indicator whereas *Dwellings without basic facilities* is from the OECD framework. In the cases where new indicators have been created, the existing ones were either too indirect, generating misleading data, or did not measure the satisfier at all. An example of that is the *Average waiting time to book a doctor appointment* indicator to the *Health systems* satisfier which was created due to the lack of a good existing indicator measuring the access aspect of that satisfier. Even though this was the most common practise for the development of the final list of indicators, there is one satisfier that is measured by an indirect existing indicator, the *Savings* satisfier for the *Protection* need. The data needed for the quality aspect of this satisfier is too complex for a single, direct indicator to measure and it could therefore provide misleading data. With this risk identified, the usage of an indirect indicator is a more reliable option. Furthermore, a few indicators are based on existing ones but they needed some adjustment in order to be applicable. An example is *Secure employment rate*. It is based on OECD's indicator *Employment rate* but it was adjusted to more efficiently measure the quality aspect of the *Work* satisfier to the Protection need. To summarise the indicator list, 17 are directly taken from existing frameworks, 15 new ones were created, one indirect and three adjusted existing indicators are used.

An important aspect to keep in mind is that satisfiers to the nine fundamental human needs varies between cultures. The indicators listed in Table 4 are based on the satisfiers in a western society as suggested by Max-Neef (1992) but if the framework is to be applicable to cities around the globe its satisfiers, and thereby also possibly its indicators, may need to be adjusted. This necessity of case-to-case adaption regarding measurement frameworks have also been highlighted by Anielski (2001).

4.2 Gothenburg case study

In order to demonstrate the applicability of the suggested measurement framework for the fundamental human needs at an urban level, a case study focusing on the Protection need was conducted for the city of Gothenburg in Sweden. Overall, the framework was efficient to use and produced accurate data by which the situation in Gothenburg could be identified. Data between the years 2000-2016 was collected which made it possible to observe the development and identify the trends of the satisfiers in the city. By the identified trends, it is possible to decide whether the situation is static, improving or getting worse.

Most of the suggested indicators were applicable to Gothenburg. There were just a few that needed to be adjusted or changed in order to produce reliable data. Below are the results of the *Protection* need data collection for Gothenburg presented.

4.2.1 Social security

The access indicator for the social security satisfier investigates the *percentage of the population who receive monetary assistance*. Data for this indicator was available between the years 2000-2011 and was collected at an urban level. The main reasons why people need social security is that they either are unemployed or suffer from illness. In Sweden, the government agency National board of health and welfare is the organisation responsible for distributing monetary assistance (socialstyrelsen.se, 2017).

Table 6 - Percentage of the population who receive social security (socialstyrelsen.se, 2017)

2000	2001	2002	2003	2004	2005
7,62 %	6,93 %	6,36 %	5,93 %	5,73 %	5,45 %
2006	2007	2008	2009	2010	2011
5,24 %	4,76 %	4,60 %	5,05 %	5,11 %	4,70 %

The trend that these numbers demonstrates is that, with the exception of 2009 and 2010, less and less people need social security. The most probable reason for the increase in those two years is the economic crisis that occurred in 2008. But even though this data suggests an overall positive development, the city of Gothenburg have, in an analytic report conducted by Tropp Vilén et. al (2014), observed large variances at sub-city levels. Furthermore, in their report it is stated that the number of people who need monetary assistance on a short-term are decreasing whereas the people who have a long-term need are increasing. The major reason for the long-term need of social security is unemployment due to lack of competences among adult population (Tropp Vilén et. al, 2014).

The idea of the quality indicator of the Social security satisfier is to calculate the average cost of social security per inhabitant and per year in Gothenburg. The results are presented below in Table 6 and data for this indicator was available between the years 2003-2015.

Table 7 - Social security cost per capita (socialstyrelsen.se, 2017)

2003	2004	2005	2006	2007	2008	
2 136kr	2 168kr	2 074kr	2 032kr	1 912kr	1 925kr	
2009	2010	2011	2012	2013	2014	2015
2 249kr	2 388kr	2 293kr	2 189kr	2 221kr	2 158kr	2 049kr

From the early years of the second millennia until 2008 the cost was steadily decreasing, showing a positive trend. But between 2008 and 2009 there was a sudden increase of a little over 300kr. The major reason behind the sudden increase was diminishing employments due to the economic crisis. After 2010, the cost per capita have slowly mitigated, once more showing a positive development. The national and global economic situation, changes in population and the situation of the labour market are the main determinant factors of the need for social security (socialstyrelsen.se, 2017).

4.2.2 Family

The indicator chosen for this satisfier is based on the *social network support* survey from OECD (2015). However, the survey is conducted on a national level, hence making its data unusable for the Gothenburg case study. Therefore, a new survey, using the same questionnaire as the OECD indicator, needs to be performed at the city level in order to retrieve reliable data.

4.2.3 Health systems

The suggested access indicator for this satisfier, *Average waiting time to book a doctor appointment*, had to be changed due to lack of available data. The new indicator that was created is based on the Swedish national warranty for health and measures the *percentage of people who received their first doctor appointment within seven days*. The Swedish warranty for health is regulated by law and states that it is the right of every individual in Sweden to meet a doctor within seven days (vantetider.se, 2017).

Data for this indicator are available between the years 2009-2016. These numbers represent the results for the Västra Götaland region and not just Gothenburg. They should therefore be considered as proxies rather than precise reflection of the situation in the city. However, since Gothenburg is the largest urban area in the Västra Götaland region, consisting of a third of the region's total population (scb.se, 2017a), it is reasonable to assume that the collected data is, to a large extent, affected by the situation in Gothenburg and hence creates a reliable proxy.

Table 8 - Percentage of people receiving their first doctor appointment within seven days (vantetider.se, 2017)

2009	2010	2011	2012	2013	2014	2015	2016
97,50 %	96 %	96,50 %	96,50 %	94,50 %	93,50 %	92,50 %	93 %

Even though this rate is close to 100%, which naturally would be the ideal outcome, it has steadily been decreasing during the investigated time frame. Therefore, this indicator highlight the need to address this negative development before it becomes even worse. One reason behind the trend could simply be that the demand for health care has increased (Vårdanalys, 2015). An analysis of the underlying causes for the increase in demand would require its own report and is therefore not included in this thesis. Another reason behind this negative trend could be that the health institutions are not able to increase the number of patients they treat, due to logistical issues and lack of personnel (Vårdanalys, 2015).

The quality indicator for the Health systems is *life expectancy at birth*. The data was collected in three time periods of four years each, which together created a total time frame of ten years. These numbers, which represent Gothenburg city, are presented in years and show a small but steady increase. Scientists argue that the major cause to the increase of the life expectancy is a greater availability of treatments and medicines which help people to live longer (scb.se, 2012).

Table 9 - Life expectancy at birth (goteborg.se, 2013a)

	2002–2006	2006–2010	2008–2012
Men	78,09	78,4	78,9
Women	82,53	82,9	83,1
Average	80,31	80,65	81

4.2.4 Work

The access indicator of the work satisfier is the *percentage of successful employments through a supportive organisation*. For Gothenburg that organisation is Arbetsförmedlingen. The organisation operates on a national level and is, through their mission of connecting employers with job-applicants, the biggest job-distributor in Sweden (arbetsformedlingen.se, 2017a). The data available for this indicator is provided by Arbetsförmedlingen and shows the development between the years 2000-2016. The results are based on a calculation of new employments assigned with the aid of Arbetsförmedlingen each year, in comparison to how many people are registered in the organisation at the end of each year.

Table 10 - Success rate of employments through Arbetsförmedlingen (arbetsformedlingen.se, 2017b)

2000	2001	2002	2003	2004	2005	2006	2007	
7,0 %	6,1 %	7,0 %	7,4 %	7,4 %	7,3 %	7,5 %	8,8 %	
2008	2009	2010	2011	2012	2013	2014	2015	2016
7,4 %	5,5 %	6,3 %	6,4 %	6,0 %	5,9 %	5,9 %	5,7 %	5,8 %

The trend that these results demonstrate is that the success rate each year was stable before the economic crisis in 2008. When that occurred, there was a drop of new employments and the success rate has not recovered since. A major issue in recent years have been to meet the employers need in terms of competences. Even though a company is looking to employ new people, they are not able to since they are having trouble to find people with the required competence (arbetsformedlingen.se, 2017c). Arbetsförmedlingen oversee the strife of connecting job-applicants with employers and they should always work towards increasing their success rate. However, the municipality of Gothenburg also have a responsibility to offer and provide the city's inhabitants the possibility to widen their competences, enabling them to meet the employers' demands.

The calculation used for this indicator generates a reliable result. However, by using this setup it is assumed that the number of people who are registered at Arbetsförmedlingen are only changing due to new employments being assigned from the organisation itself. In reality there are probably other causes as well such as, employments are generated without the help of Arbetsförmedlingen or that people are leaving the organisation for other reasons. But even though this assumption regarding the calculation of the data exists, the outcome should be considered as accurate in the purpose of identifying a trend.

The quality indicator of the work satisfier shows the percentage of people in the city who have permanent employments. It is calculated by comparing Gothenburg's yearly population with the number of people who have permanent employments. Data was available between 2005 and 2016.

Table 11 - Secure employment rate (scb.se, 2017b)

2005	2006	2007	2008	2009	2010
35,9 %	36,5 %	38,0 %	38,0 %	36,7 %	36,5 %
2011	2012	2013	2014	2015	2016
37,3 %	37,9 %	37,4 %	37,3 %	38,3 %	39,5 %

The development of secure employments during the past ten years is positive, with the highest yearly rate recorded in 2016. An analysis of the Swedish labour market in 2016 states that unemployment is decreasing due to an overall improving economic situation, which is supported by the Gothenburg statistics presented in Table 10 (arbetsförmedlingen.se, 2017c).

4.2.5 Insurance systems

Both the suggested access and quality indicators for this satisfier are not possible to use in this case study. Since there are many independent companies offering insurance services to the public, it is difficult to collect the data needed to provide a reliable understanding of the overall situation. Because of this issue, the use of proxies to identify trends can, in this case, be unreliable and therefore no new indicator should be created to substitute the initial ones. However, another possibility would be to conduct a questionnaire to gather the data from. Questions included in it could be "how much of your income do you spend on insurances?" and "how many insurances cases have had a positive outcome for you?".

4.2.6 Rights

For this satisfier, one indicator is used to measure both access and quality, and it identifies how large share of Gothenburg's inhabitants utilised their right to vote in the governmental election. Since the election is held every four years, statistics for the four most recent ones are used.

Table 12 - Voter turnout in Gothenburg (scb.se, 2017c)

2002	2006	2010	2014
77,5 %	79,5 %	82,7 %	82,8 %

The results presented in Table 11 show a positive development. However, according to Erica Litzén, who in 2010 was the manager of Gothenburg city's unit for analysis and statistics, this development is believed to be caused more by an increased distinction between the political parties than by an observed change in society (vartgoteborg.se, 2010). In another analysis, which was conducted by SCB (2017c), it is stated that voter turnout differs a lot between both people of different educational levels and by age.

4.2.7 Savings

The suggested indicator, for both access and quality, for this satisfier needed to be changed for the case study because of lack of available data. Initially, OECD's indicator *average annual earnings per employee* was going to be used, but instead data from the municipality of Gothenburg (goteborg.se, 2017a) highlighted the need for a minor change of the indicator to *average annual earnings per capita*. Since this indicator measures the satisfier indirectly, the change does not affect the ability to identify a trend. The idea is to make the assumption that if a person earns more, he/she is able to save more money.

Table 13 - Average annual earnings per capita (goteborg.se, 2017a)

2007	2008	2009	2010
229 295kr	237 972kr	236 560kr	239 799kr
2011	2012	2013	2014
248 445kr	256 685kr	262 912kr	269 503kr

As demonstrated in Table 12, the development from year to year have been consistently positive, except from 2008 to 2009. The reason for this temporary decrease is the economic crisis in 2008. The municipality of Gothenburg states that these results are in direct correlation with the current employment rate in the city (goteborg.se, 2013b).

4.2.8 Connections between the indicators

Initially, the case study identifies that many of the satisfiers to the Protection need were affected by the economic crisis that occurred in 2008. As discussed in paragraphs earlier in this chapter, the consequences have been all through negative. However, in some cases those dips were quickly turned around again whereas some indicators show that a few have not recovered as of yet. For example, *average annual earnings per capita* demonstrated a fast recovery after the crisis, in contrast to the *success rate of employments through Arbetsförmedlingen* which still is lower than it was before 2008.

Moreover, the satisfiers which have most observable correlations between each other are *Social security*, *Work* and *Savings*. These are all directly affected by the situation on the labour market. In theory, if there is a positive development on the labour market it will result in more employments. An increased *employment rate* will generate higher *average annual earnings per capita* (goteborg.se, 2013b). And since employment rate have been identified as the main contributing factor affecting monetary assistance (socialstyrelsen.se, 2017), the need for and cost of social security will decrease. The findings of these indicators, and their identified trends, in the case study support the assumptions the theory states regarding the correlation between them.

Furthermore, an interesting connection between the decrease of the *success rate of employments through Arbetsförmedlingen* and the increase of the *secure*

employment rate was identified. These trends suggest that companies and job-applicants are more and more using other methods, than going through Arbetsförmedlingen, in their efforts of matching up. An assumption to what cause this observation could have, is that Arbetsförmedlingen might be seen as an ineffective actor to utilise and is therefore increasingly overlooked by companies and job-applicants in the recruitment process.

Finally, it should be mentioned that if a case study of all nine fundamental human needs were to be conducted for Gothenburg, it would probably be possible to identify more connections between satisfiers for the different needs.

4.2.9 The reliability of the indicators

It should be discussed to what extent each of the indicators measure the satisfiers. In some cases, the satisfiers are difficult to measure in numbers, hence making the task of creating reliable indicators for them complex. Even so, most of the indicators covers the satisfiers in an effective and comprehensive manner, such as *Voter turnout* for the Rights satisfier and both of the indicators for Social Security. However, a few indicators are more indefinite in their measurement and one example is, as mentioned in Section 4.1, the *Average annual income per capita* indicator which does not create a precise representation of the Savings satisfier. Moreover, the access indicator for the Work satisfier is somewhat limited in its measurement since Arbetsförmedlingen, whilst being the largest, is not the only aiding organisation in its business area. Other than these mentioned indicators, the final framework used in the case study is reliable.

4.3 Using the outcome for managing city development

Identifying current situations and trends over time for the satisfiers makes it possible to use the information in order to enhance city development (Anielski, 2001; OECD, 2015). First, it provides the city with an indication whether it is on the course towards sustainability. Second, the information can highlight which areas that need improving, helping decision-makers to motivate their choices for future progress. Third, the identified trends over time can help examine the impact previous implemented measures have had and makes it possible to evaluate whether the measures are progressing as intended or if new ideas need to be developed and implemented instead. To summarise, this kind of measurement can be of great aid for policy-makers (Anielski, 2001; OECD, 2015)

A major issue identified in the case study is the situation of the labour market, which mostly concerns the *Work* satisfier but also affects *Social security* and *Savings*. The connections between these three are explained in Section 4.2.8. Arbetsförmedlingen have, since 2015, put a larger focus on establishing close relationships with employers. One of the outcomes these relationships aim to achieve is for Arbetsförmedlingen to have a better understanding of the needs and demands the labour market have on competences. By knowing what skills and abilities are on demand, their objective of connecting employers and job-applicants can become more efficient (arbetsformedlingen.se, 2017c). As the results in Table 9 show, there has not been much effect of their strife as of 2016. A

problem identified by them is that there is a general lack of desired competences among job-applicants. By making it possible for people to educate themselves, this problem could be addressed and the competence gaps satisfied (arbetsformedlingen.se, 2017c). The department at Göteborg Stad which is responsible for adult education, is called Utbildningsförvaltningen (goteborg.se, 2017b). If Arbetsförmedlingen and Utbildningsförvaltningen co-operated, adult education spots could be created and designed based on identified competence gaps on the labour market. By doing so, the likelihood of job-connections being done should become enhanced.

Another negative trend that was observed in the case study is the increasing waiting times for the doctor appointments. As presented in Section 4.2.3, the waiting times have increased steadily since 2009. The population of Gothenburg have increased during these years and thereby also the demand for healthcare. Evidently, the health system has not been able to correspond to the rising demand and the need for implementing measures is therefore highlighted. According to Vårdanalys (2015), a solution could be to create more efficient work processes for the doctors and thereby mitigating time wasting activities. By doing so, it is possible to maximise the available resources and in the end, make healthcare more accessible for the inhabitants of the city. Furthermore, Vårdanalys (2015) suggests that problems caused by absence of personnel need to be remedied. During certain seasons of the year, waiting times have been observed to increase dramatically due to this issue. Therefore, the staffing at each healthcare institution should be able to foresee these periods and should make sure that the appropriate amount of personnel is available. The organisation responsible for the public healthcare system in Sweden operate on a regional level. The area in which Gothenburg is included, is called Region Västra Götaland (vgregion.se, 2017) and they are the major responsible actor for creating and implementing these measures. However, for the measures to be efficiently realised, each healthcare institution need to actively apply them (Vårdanalys, 2015).

Finally, the trend of the voter turnout has been identified as a minor issue. Even though it has increased during the past four elections, it could still be improved. Ahead of elections, the municipalities in Sweden usually receive an amount of money from the government meant for financing information campaigns. These campaigns are then conducted by the municipalities and aims to increase each individual's interest in utilising their right to vote (vartgoteborg.se, 2010). Since it is observed that the voter turnout is higher among people with a higher education (scb.se, 2017c), these campaigns should be especially focused towards people with lower level education. By successfully addressing the latter group, the overall voter turnout could possibly increase dramatically.

5 Conclusion

Through the process of this thesis, it has been concluded that none of the existing measurement frameworks, in their original design, completely cover the nine fundamental human needs. However, OECD's framework is fairly applicable and can be used as a basis for the final suggested framework which consists of a total of 36 indicators, 18 from existing frameworks and 18 newly created ones. In order to collect data for eight of the suggested indicators, surveys need to be conducted. Once the required data have been collected, it can be used to identify trends within the studied urban area. The trends provide information on how well the studied area satisfies its inhabitants' fundamental human needs. This information can then be used as a basis for decision-makers in their efforts of developing and improving the city further and striving to achieve a sustainable development.

The main findings in this thesis show interesting correlations between some satisfiers connected to the labour market. The information provided by the measurement conducted suggest that by increasing the communication between the organisations responsible for each of these satisfiers, it can be possible to adapt some of their functions which in turn will strengthen them. Furthermore, shortcomings in the health care system were identified. Present institutions have not been prepared for the consistent population increase during the recent years and therefore more personnel need to be employed along with the implementation of more efficient work processes. Lastly, in the effort of increasing the voter turnout in national elections, information campaigns aimed to certain target groups need to be conducted.

In order to enhance the study conducted in this thesis, further research should be focused on especially two things. First, a case study should be performed by using the complete suggested measurement framework. From such a research, it will be possible to determine the usefulness of it. Second, satisfiers and indicators for other cultures should be developed. By doing so, this type of measurement can be used for urban areas all around the globe, helping to strive towards creating better cities and a sustainable development.

6 References

- Alderfer, C. P. (1972), *Existence, Relatedness, and Growth; Human Needs in Organizational Settings*, New York: Free Press
- Alshenqeeti, H. (2014). Interviewing as a data collection method: a critical review. *English Linguistics Research*, 3(1), pp. 39-45.
- Anielski, M. (2001). *The Alberta GPI Blueprint; The genuine progress indicator (GPI) sustainable well-being accounting system*. Alberta: Pembina Institute
- Arbetsförmedlingen (2017a) *Om oss*.
<https://www.arbetsformedlingen.se/Om-oss.html> (08 May 2017)
- Arbetsförmedlingen (2017b) *Statistik och publikationer: Tidigare Statistik*.
<https://www.arbetsformedlingen.se/Om-oss/Statistik-och-publikationer/Statistik/Tidigare-statistik.html> (08 May 2017)
- Arbetsförmedlingen (2017c) *Årsredovisning 2016*.
<https://www.arbetsformedlingen.se/Om-oss/Statistik-och-publikationer/Rapporter/Arsredovisningar/2017-02-23-Arbetsformedlingens-arsredovisning-2016.html> (08 May 2017)
- Centers for Disease Control and Prevention (2017). *Well-being concepts*.
<https://www.cdc.gov/hrqol/wellbeing.htm> (07 Feb. 2017)
- Diener, E.D., 1984. Subjective well-being. *American Psychological Association*, 95(3), pp. 542-575.
- Diener, E.D., Emmons, R.A., Larsen, R.J. and Griffin, S., 1985. The satisfaction with life scale. *Journal of personality assessment*, 49(1), pp.71-75.
- Diener, E.D., Suh, E.M., Lucas, R.E., Smith, H.L., 1999. Subjective well-being: Three decades of progress. *American Psychological Association*, 125(2), pp. 276-302.
- El-Din, G. (2005). *Human development index adjusted for environmental indicators: case study in one Egyptian village*. *Eastern Mediterranean Health Journal*, 11, 1124-1127.
- Evidence-Based Review of Moderate to Severe Acquired Brain Injury, (2017). *Satisfaction with Life Scale*.
<http://www.abiebr.com/set/17-assessment-outcomes-following-acquiredtraumatic-brain-injury/satisfaction-life-scale> (12 Mar. 2017)
- Göteborg Stad (2013a) *Publiceringsplan: Livslängdstabeller för stadsdelsnämnderna i Göteborg*.
<http://www4.goteborg.se/prod/Ginfo/statistik.nsf/34f4087fac810b1ac1256cdf003efa4b/d477308b8741a70ec1257c62003e56e6!OpenDocument> (24 April 2017)

Göteborg Stad (2013b) *Publiceringsplan: Inkomster - Medelinkomst*
<http://www4.goteborg.se/prod/g-info/statistik.nsf/34f4087fac810b1ac1256cdf003efa4b/b75413fcde3c788cc1257ceb00461763!OpenDocument> (09 May 2017)

Göteborg Stad (2017) *Statistikdatabasen: Inkomster och utbildning*.
<http://statistikdatabas.goteborg.se/pxweb/sv/Delområden/Befolkning-Bostäder-Arbete-Inkomster-Utbildning/?rxid=feec9980-915e-4bb4-bc3f-540584a3257f> (09 May 2017)

Hamilton, C., & Saddler, H. (1997). The Genuine Progress Indicator. *A new index of changes in well-being in Australia*, (14).

International Council for Science (2017) *Health and Wellbeing in the Changing Urban Environment: a Systems Analysis Approach*. <http://www.icsu.org/what-we-do/interdisciplinary-bodies/health-and-wellbeing-in-the-changing-urban-environment> (07 Feb. 2017)

Kinver, M. (2014) Global science programme to focus on urban wellbeing. *BBC*.
<http://www.bbc.com/news/science-environment-30381476> (06 Oct. 2016).

Kuklys, W. (2005), *Amartya Sen's capability approach: theoretical insights and empirical applications*, 1st edn, Springer, New York

Kobau, R., Snizek, J., Zack, M. M., Lucas, R. E., & Burns, A. (2010). *Well-being assessment: An evaluation of well-being scales for public health and population estimates of well-being among US adults*. *Applied Psychology: Health and Well-being*, 2(3), 272-297.

Lawn, P. A. (2003), *A theoretical foundation to support the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and other related indexes*. *Ecological Economics*, 44, 105-118.

Max-Neef, M., Elizalde, A., & Hopenhayn, M. 1992, *Development and human needs*. *Real-life economics: Understanding wealth creation*, 197-213.

Maslow, A.H. (1954), *Motivation and Personality*. New York: Harper & Row.

Midss (2017) *The satisfaction with life scale*.
<http://www.midss.org/content/satisfaction-life-scale-swl> (06 Mar. 2017)

Organisation for Economic Co-operation and Development (2015), *How's Life?: Measuring Wellbeing*. Paris: OECD Publishing

Pavot, W. G., Diener, E., Colvin, C. R., & Sandvik, E. (1991). *Further validation of the Satisfaction with Life Scale: Evidence for the cross-method convergence of well-being measures*. *Journal of Personality Assessment*, 57, 149-161.

Pollard E. L. and Davidson L. (2001). *Foundations for Child Well-being*. UNESCO Education Sector. Paris: Early Childhood and Family Education Unit

Shin, D.C., Johnson, D.M. (1978). *Avowed Happiness as the Overall Assessment of the Quality of Life*. Social Indicators Research, 5, 475–492.

Socialstyrelsen (2017) *Ekonomiskt bistånd*.
<http://www.socialstyrelsen.se/ekonomisktbistand> (07 May 2017)

Statistiska Centralbyrån (2012) *Medellivslängden ökar stadigt*.
http://www.scb.se/sv_/Hitta-statistik/Artiklar/Medellivslangden-okar-stadigt/
(05 May 2017)

Statistiska Centralbyrån (2017a) *Statistikdatabasen: Folkmängd*.
http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START_BE_BE0101_BE0101A/BefolkningNy/?rxid=7e01321d-9416-4c7e-b931-a9ab0b0e4f42 (23 April 2017)

Statistiska Centralbyrån (2017b) *Statistikdatabasen: Sysselsatta från och med 2005*.
http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START_AM_AM0401_AM0401I/NAKUSysslarbAr/?rxid=195162d9-caed-48ca-9ba1-93f2f8aab913 (28 April 2017)

Statistiska Centralbyrån (2017c) *Statistikdatabasen: Valdeltagande*.
http://www.vartgoteborg.se/prod/sk/vargotnu.nsf/1/val_2010,valdeltagandet_okade_i_goteborg_men_stora_lokala_skillnader (09 May 2017)

Tropp Vilén, S., Holmlund, L., Larsson, Kaj., Hjerdt, R. (2014). *Antalet hushåll i långvarigt beroende av försörjningsstöd ska minska i Göteborgs Stad*.
<https://goteborg.se/wps/wcm/connect/fe9cd760-d073-439f-d99f6d2fc1012cb/F%C3%B6rs%C3%B6rjningsst%C3%B6d,%2Brapport.pdf?MOD=AJPERES>

United Nations (2017) *The sustainable development agenda*.
<http://www.un.org/sustainabledevelopment/development-agenda/> (10 Feb. 2017)

United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Urbanization Prospects: The 2014 Revision*.

United Nations Development Programme (2017) *Human Development Index (HDI)*. <http://hdr.undp.org/en/content/human-development-index-hdi> (21 Feb. 2017)

United Nations Environment Programme (2015) *The three dimensions of sustainable development*.

<http://web.unep.org/ourplanet/march-2015/unep-work/three-dimensions-sustainable-development> (06 Feb. 2017)

Vårdanalys (2015). *Varierande väntan på vård*. Myndigheten för vårdanalys. Stockholm: TMG Sthlm

Vårt Göteborg (2010) *Valdeltagandet ökade i Göteborg*.

http://www.vartgoteborg.se/prod/sk/vargotnu.nsf/1/val_2010,valdeltagandet_okade_i_goteborg_men_stora_lokala_skillnader

Väntetider i vården (2017) *Läkarbesök i primärvården*.

<http://www.vantetider.se/Kontaktkort/Vastra-Gotalands/PrimarvardBesok/> (24 April 2017)

Västra Götalandsregionen (2017) *About Region Västra Götaland*.

<http://www.vgregion.se/en/about/> (05 May 2017)

Wen, Z., Zhang, K., Du, B., Li, Y., Li, W. (2007). *Case study on the use of genuine progress indicator to measure urban economic welfare in China*. Ecological economics, 63, 463-475.

World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press.

Appendix A – Evaluation of OECD’s indicators

<u>Needs</u>	<u>Satisfiers</u>	<u>OECD Framework Indicators</u>	<u>My motivation for the choice of indicators</u>
Subsistence	<i>Food</i>	- Household adjusted disposable income + *- Satisfaction with water quality +	- Shows how much money people can spend on things such as food - Indicates whether drinking water is good or not in the city
	<i>Shelter</i>	- Number of rooms per person - - Household adjusted disposable income + *- Housing expenditure + *- Dwellings without basic facilities - *- Household net financial wealth + ** - Gini Index - - Air quality -	- Not relevant for the city - Shows how much money people have to spend on houses - How expensive are homes in the city? Should be compared with <i>Household adjusted disposable income</i> - Could be useful to determine the standard of the dwellings in the city - Not really relevant, other indicators are better - Shows income distribution → what types of dwellings to build - Not relevant
	<i>Work</i>	- Employment rate - - Long-term unemployment rate - - Probability of becoming unemployed - - Household adjusted disposable income + *- Average annual earnings per employee ++ ** - Gini Index - *- Competences in adult population - *- Social network support -	- Not relevant under <i>Subsistence</i> - Not relevant under <i>Subsistence</i> - Not relevant under <i>Subsistence</i> - Shows how much money the city households are earning - Good indicator. Shows earnings per person. - Shows distribution of earnings, thereby identifying income gaps - Not relevant under <i>Subsistence</i> - Not relevant under <i>Subsistence</i>
Protection	<i>Social security</i>	- Homicide rate (deaths by assault) - *- Self-reported victimisation - ** - Car theft rate - ** Mortality due to transport accidents - ** - Gini Index - - Employment rate - - Long-term unemployment rate ++ - Probability of becoming unemployed - * Employees working very long hours -	- Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Can identify how large % of the population need social security (Need to be used along with other indicators identifying people with disabilities, sick leaves etc.) - Not relevant here - Not relevant here
	<i>Family</i>	- Number of rooms per person - *- Social network support +	- Not relevant here - Can identify how many people are feeling lonely → the city can act to mitigate this number by providing support (In the end lower crime?)
	<i>Health systems</i>	- Life expectancy at birth ++ *- Perceived health ++ ** Age adjusted mortality rate ++ *- Satisfaction with water quality - ** Average distance to closest hospital ++ ** Unmet medical needs ++ - Air quality -	- Identifies how good the health systems are - The individuals’ opinion on how good/reliable the health systems are - Identifies how good the health systems are - Not relevant here - Indicates how “conveniently” located the hospitals in a city are - Can highlight problems in the health systems - Not relevant here
	<i>Work</i>	- Employment rate ++ - Long-term unemployment rate - - Probability of becoming unemployed + - Household adjusted disposable income - ** - Gini Index - - Educational attainment - *- Competences in adult population -	- Shows how many people have jobs in the city - Not relevant here (other indicator are better) - Can identify trends of job availability in the city - Not relevant here - Not relevant here - Not relevant here - Not relevant here
	<i>Insurance systems</i>	- Household adjusted disposable income + ** - Gini Index +	- Indicates how much money people can spend on insurances - Indicates the income distribution → how many of the population can afford insurances
	<i>Rights</i>	- Voter turnout + *- Government stakeholder engagement -	- How well is the democracy executed - Maybe not relevant at city level
	<i>Savings</i>	- Average annual earnings per employee - - Household adjusted disposable income + *- Housing expenditure - *- Household net financial wealth + ** - Gini Index -	- There are better indicators for this satisfier - Indicates how much money people are able to put away and save - Not relevant here - Not relevant here - Identifies distribution of income → connect with the other indicator here

Affection	<i>Friendships</i>	*- social network support + - Employment - - Long-term unemployment rate - * Employees working very long hours - * - Time devoted to personal care and leisure -	- How many people feel that they have friends - Not relevant here - Not relevant here - Not relevant here - Not relevant here
	<i>Family</i>	*- Social network support + - Number of rooms per person - * Employees working very long hours - * - Time devoted to personal care and leisure -	- Shows how people perceive their social support is from their family - Not relevant here - Not relevant here - Not relevant here
	<i>Partnerships</i>	- Number of rooms per person - * Employees working very long hours - * - Time devoted to personal care and leisure - *- Social network support +	- Not relevant here - Not relevant here - Not relevant here - Could make sense to add here. Same motivation as for family and friendships
	<i>Relationship with nature</i>	- Air quality - * Perceived health - * - Time devoted to personal care and leisure + **-. Loss of forest and vegetation - **-. Municipal waste recycled - **-. Access to green space +	- Not relevant here - Not relevant here - Could indicate how much time people can spend out in the nature, thereby fulfilling the affection need - Not relevant here - Not relevant here - Connected to the “leisure time” indicator. How easy is it for inhabitants to spend their time in the nature?
Understanding	<i>Literature</i>	- Educational attainment - *- Competences in adult population -	- Not relevant here - Not relevant here (- should this instead by something like “accessibility to libraries and/or the internet”?)
	<i>Method</i>	- Students’ cognitive skills - * Perceived health - * - Time devoted to personal care and leisure +	- Not relevant here - Not relevant here - Could indicate how much time people can spend on learning
	<i>Teachers</i>	- Educational attainment - - Students’ cognitive skills -	- Not relevant here - Not relevant here
	<i>Educational and communicational policies</i>	- Educational attainment ++ - Students’ cognitive skills ++ *- Competences in adult population ++	- Show how well the schools are working - Shows how well the educational methods are working - Shows if there is a need to increase possibilities for adults to educate themselves (especially interesting with the current immigration situation → how to introduce/use the new labour force?)
Participation	<i>Rights</i>	- Voter turnout + *- Government stakeholder engagement - - Students’ cognitive skills -	- Might indicate how well the democracy system is working - Not relevant at city level - Not relevant here
	<i>Responsibilities</i>	- Employment rate - - Long-term unemployment rate - - Educational attainment +	- Not relevant here - Not relevant here - Add this to show how many students attend their education?
	<i>Duties</i>	- Employment rate - - Long-term unemployment rate -	- Not relevant here - Not relevant here
	<i>Privileges</i>	* - Time devoted to personal care and leisure - - Educational attainment - **-. Broadband connection + **-. Access to public transport +	- Not relevant here - Not relevant here - A vital aspect of being a part of the modern society. Can show how many people can use it. - Can indicate how easy it is for people to travel to various activities which they participate in
	<i>Work</i>	- Employment rate ++ - Long-term unemployment rate - - Probability of becoming unemployed - * Perceived health -	- Shows how many people participate in a job - Other indicator are better - Not relevant here - Not relevant here
Leisure	<i>Games</i>	- Life satisfaction - * Perceived health - *- Time devoted to personal care and leisure +	- Not relevant here - Not relevant here - How much time people can spend on games
	<i>Spectacles</i>	- Life satisfaction - * Perceived health - * - Time devoted to personal care and leisure +	- Not relevant here - Not relevant here - How much time people can spend on spectacles

	<i>Clubs</i>	- Life satisfaction *- Social network support * Perceived health * - Time devoted to personal care and leisure	- - - +	- Not relevant here - Not relevant here - Not relevant here - How much time people can spend on club-activities
	<i>Parties</i>	- Life satisfaction *- Social network support * Perceived health * - Time devoted to personal care and leisure	- - - +	- Not relevant here - Not relevant here - Not relevant here - Time to spend on going to/arranging parties
	<i>Peace of mind</i>	*- Social network support - Number of rooms per person - Life satisfaction * - Time devoted to personal care and leisure * Perceived health * Employees working very long hours - Educational attainment - Air quality **- Access to green space	- - + - - - - - -	- Not relevant here - Not relevant here - Identifies how happy people are with their lives. If they are at peace. - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here
Creation	<i>Abilities</i>	*- Competences in adult population - Time devoted to leisure and personal care * Perceived health	- - -	- Not the best indicator for this satisfier - Not relevant here - Not relevant here
	<i>Skills</i>	- Educational attainment *- Competences in adult population - Employment rate - Long-term unemployment rate * Perceived health	- + - - -	- Not relevant here - Shows how large part of the adult population have skills (not which skills though...) - Not relevant here - Not relevant here
	<i>Method</i>	- Number of rooms per person * Perceived health - Students' cognitive skills **- Access to public transport	- - - +	- Not relevant here - Not relevant here - Not relevant here - Can show how easy it is for people to get to a place where they can express/utilise their creativity
	<i>Work</i>	- Educational attainment *- Competences in adult population - Employment rate - Long-term unemployment rate - Probability of becoming unemployed * Perceived health	- - + - - -	- Not relevant here - Not relevant here - Shows how many people can/could use their job as a way to express/utilise their creativity - Not relevant here - Not relevant here - Not relevant here
Identity	<i>Symbols</i>	- Educational attainment *- Social network support	- -	- Not relevant here - Not relevant here
	<i>language</i>			
	<i>religions</i>	*- Social network support	-	- Not relevant here
	<i>habits</i>	*- Social network support - Employment rate - Long-term unemployment rate - Number of rooms per person * Perceived health **- Broadband connection **- Access to public transport	- - - - - - -	- Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here
	<i>customs</i>			
	<i>reference groups</i>	*- social network support - Educational attainment - Employment rate - Long-term unemployment rate	+ - + -	- Could be relevant by identifying how many individuals have people around them as a reference group - Not relevant here - People can refer to their coworkers as their reference group. - Not relevant here
	<i>sexuality</i>			

	<i>values</i>	- Number of rooms per person - Educational attainment	- -	- Not relevant here - Not relevant here
	<i>norms</i>			
	<i>historical memory</i>			
	<i>work</i>	*- Social network support - Educational attainment - Employment rate - Long-term unemployment rate - Probability of becoming unemployed * Perceived health	- - + - - -	- Not the best indicator here - Not relevant here - Same motivation as on <i>reference group</i> - Not relevant here - Not relevant here - Not relevant here
Freedom	<i>Equal rights</i>	- Voter turnout *- Government stakeholder engagement *- Time devoted to personal care and leisure - Students' cognitive skills **- Access to public transport	++ - - + + +	-Can everyone vote? (Maybe specify this indicator a bit) - Not relevant here - Not relevant here - Can the student who are doing "bad" in school get the help they need to improve? - Can people with disabilities access the public transport with the same ease as people without disabilities?

Appendix B – Evaluation of GPI’s indicators

<u>Needs</u>	<u>Satisfiers</u>	<u>GPI Indicators</u>		<u>My motivation for the choice of indicators</u>
Subsistence	<i>Food</i>	<ul style="list-style-type: none"> - Personal consumption expenditure - Services yielded by consumer durables - Net capital investment - Loss of farmland - Cost of resource depletion - Cost of water pollution 	+ - - + - +	<ul style="list-style-type: none"> - Indicates how much money individuals can spend on food - Not relevant here - Not relevant here - Could indicate how food-production possibilities change (“Are the food-production capabilities of the city enough to supply the people?”) - Other indicators are better - Could be used to see how water accessibility is affected
	<i>Shelter</i>	<ul style="list-style-type: none"> - Personal consumption expenditure - Index of distributional income equity - cost of consumer durables - Services yielded by consumer durables - Services yielded by publicly provided human-made capital - Net capital investment - Cost of air pollution 	+ - + - - - -	<ul style="list-style-type: none"> - Show how much money individuals can spend on housing - Shows gaps in the population as to what types of houses they can afford - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here
	<i>Work</i>	<ul style="list-style-type: none"> - Personal consumption expenditure - Index of distributional income equity - Cost of underemployment - Net capital investment - Cost of resource depletion 	+ + - - -	<ul style="list-style-type: none"> - Gives an indication on how much money individuals are earning - Shows income gaps among the inhabitants - Not relevant here - Not relevant here - Not relevant here
Protection	<i>Social security</i>	<ul style="list-style-type: none"> - Index of distributional income equity - Services yielded by consumer durables - Cost of crime - Cost of vehicle accidents - Net capital investment - Cost of family breakdown - Cost of under/unemployment 	- - - - - ++ +	<ul style="list-style-type: none"> - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Shows how much money is spent on helping people in “family failure” situations - Shows how much money is spent on helping unemployed people
	<i>Family</i>	<ul style="list-style-type: none"> - Cost of lost leisure time - Cost of family breakdown 	- -	<ul style="list-style-type: none"> - Not relevant here - Not relevant here
	<i>Health systems</i>	<ul style="list-style-type: none"> - Services yielded by consumer durables - Services yielded by publicly provided human-made capital - Cost of lost leisure time - Cost of noise pollution - Net capital investment - Cost of air pollution - Cost of water pollution - Cost of ozone depletion 	- + - - - - - -	<ul style="list-style-type: none"> - Not relevant here - If adjusted, it could show how much public health care is provided to the inhabitants in a city - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here
	<i>Work</i>	<ul style="list-style-type: none"> - Personal consumption expenditure - Index of distributional income equity - Cost of under/unemployment - Net capital investment 	- - + -	<ul style="list-style-type: none"> - Not relevant here - Not relevant here - Shows the effect of underemployment - Not relevant here
	<i>Insurance systems</i>	<ul style="list-style-type: none"> - Personal consumption expenditure - Index of distributional income equity - Services yielded by consumer durables - Net capital investment 	+ + - -	<ul style="list-style-type: none"> - Shows how much money people can spend on insurances - Shows the gaps in how much people can spend on insurances (who can afford what?) - Not relevant here - Not relevant here
	<i>Rights</i>			
	<i>Savings</i>	<ul style="list-style-type: none"> - Personal consumption expenditure - Index of distributional income equity 	- +	<ul style="list-style-type: none"> - Not relevant here - Shows gaps in income → how much are people able to save?
	<i>Friendships</i>	<ul style="list-style-type: none"> - Cost of lost leisure time 	-	- Not relevant here
Affection	<i>Family</i>	<ul style="list-style-type: none"> - Cost of lost leisure time 	-	- Not relevant here

	<i>Partnerships</i>	- Cost of lost leisure time	-	- Not relevant here
	<i>Relationship with nature</i>	- Cost of air pollution - Cost of water pollution - Cost of long-term environmental damage - Loss of wetlands - Loss of old-growth forests - Cost of lost leisure time	- - - + + +	- Not relevant here - Not relevant here - Not relevant here - Could indicate the accessibility people have to nature - Could indicate the accessibility people have to nature - Could indicate how much time people can spend fulfilling their affection need by being in the nature
Understanding	<i>Literature</i>	- Services yielded by publicly provided human-made capital - Net capital investment	++ -	- Shows how many libraries etc. are available - Not relevant here
	<i>Method</i>	- Services yielded by publicly provided human-made capital - Net capital investment - Cost of lost leisure time	- - +	- Not relevant here - Not relevant here - Could indicate how much time people have to spend on learning new things
	<i>Teachers</i>	- Services yielded by volunteer work - Net capital investment	- -	- Not relevant here - Not relevant here
	<i>Educational and communicational policies</i>	- Services yielded by publicly provided human-made capital - Services yielded by volunteer work	++ -	- What are the policies regarding learning possibilities in the city? - Not relevant here
Participation	<i>Rights</i>			
	<i>Responsibilities</i>			
	<i>Duties</i>			
	<i>Privileges</i>	- Services yielded by consumer durables	-	- Not relevant here
	<i>Work</i>	- Services yielded by volunteer work - Cost of underemployment	+ -	- Could show how engaged/participative people are in various activities - Not relevant here
Leisure	<i>Games</i>	- Services yielded by publicly provided human-made capital - Cost of lost leisure time	- +	- Not relevant here - How much time people can spend on games
	<i>Spectacles</i>	- Services yielded by publicly provided human-made capital - Cost of lost leisure time - Net capital investment	- + -	- Not relevant here - How much time people can spend on spectacles - Not relevant here
	<i>Clubs</i>	- Cost of lost leisure time	+	- How much time people can spend on club-activities
	<i>Parties</i>	- Cost of lost leisure time	+	- How much time people can spend on arranging/attending parties
	<i>Peace of mind</i>	- Services yielded by consumer durables - Services yielded by publicly provided human-made capital - Cost of lost leisure time - Cost of long-term environmental damage - Loss of wetlands - Loss of old-growth forests	- - - - - -	- Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here - Not relevant here
Creation	<i>Abilities</i>	- Cost of lost leisure time	-	- Not relevant here
	<i>Skills</i>			

	<i>Method</i>	<ul style="list-style-type: none"> - cost of consumer durables - Services yielded by consumer durables - Services yielded by publicly provided human-made capital - Cost of commuting - Net capital investment 	<ul style="list-style-type: none"> - + + - - 	<ul style="list-style-type: none"> - Not relevant here - Possibilities for people to fulfil their creation needs - Possibilities for people to fulfil their creation needs - Not relevant here - Not relevant here
	<i>Work</i>	<ul style="list-style-type: none"> - Cost of underemployment 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - Not relevant here
Identity	<i>Symbols</i>			
	<i>language</i>			
	<i>religions</i>			
	<i>habits</i>			
	<i>customs</i>			
	<i>reference groups</i>			
	<i>sexuality</i>			
	<i>values</i>			
	<i>norms</i>			
	<i>historical memory</i>			
	<i>work</i>	<ul style="list-style-type: none"> - Services yielded by volunteer work - Cost of underemployment 	<ul style="list-style-type: none"> + - 	<ul style="list-style-type: none"> - Could show how people identify themselves through volunteer work - Not relevant here
Freedom	<i>Equal rights</i>			

Appendix C – Evaluation of HDI's indicators

<u>Needs</u>	<u>Satisfiers</u>	<u>HDI Indicators</u>		<u>My motivation for the connection</u>
Subsistence	<i>Food</i>	- GNI per capita	+	- How much money people have to spend on items such as food
	<i>Shelter</i>	- GNI per capita	+	- How much money people have to spend on items such as housing
	<i>Work</i>	- GNI per capita	++	- How much money people earn
Protection	<i>Social security</i>			
	<i>Family</i>			
	<i>Health systems</i>	- Life expectancy at birth	++	- Indicates how well functioning the health systems are
	<i>Work</i>	- GNI per capita	-	- Not relevant here
	<i>Insurance systems</i>	- GNI per capita	+	- How much people reasonably can spend on insurances
	<i>Rights</i>			
	<i>Savings</i>	- GNI per capita	+	- Indicates how much people are able to spend
Affection	<i>Friendships</i>			
	<i>Family</i>			
	<i>Partnerships</i>			
	<i>Relationship with nature</i>			
Understanding	<i>Literature</i>	- Expected years of schooling - Mean years of schooling	- -	- Not relevant here - Not relevant here
	<i>Method</i>			
	<i>Teachers</i>			
	<i>Educational and communicational policies</i>	- Expected years of schooling - Mean years of schooling	++ ++	- Indicates schooling policies - Indicates actual effects of the policies

Participation	<i>Rights</i>			
	<i>Responsibilities</i>			
	<i>Duties</i>			
	<i>Privileges</i>			
	<i>Work</i>			
Leisure	<i>Games</i>			
	<i>Spectacles</i>			
	<i>Clubs</i>			
	<i>Parties</i>			
	<i>Peace of mind</i>			
Creation	<i>Abilities</i>	- Mean years of schooling	-	- Not relevant here
	<i>Skills</i>	- Mean years of schooling	-	- Not relevant here
	<i>Method</i>			
	<i>Work</i>	- Mean years of schooling	-	- Not relevant here
Identity	<i>Symbols</i>	- Mean years of schooling	-	- Not relevant here
	<i>language</i>			
	<i>religions</i>			
	<i>habits</i>			
	<i>customs</i>			
	<i>reference groups</i>	- Mean years of schooling	-	- Not relevant here
	<i>sexuality</i>			

	<i>values</i>	- Mean years of schooling	-	- Not relevant here
	<i>norms</i>			
	<i>historical memory</i>			
	<i>work</i>	- Mean years of schooling	-	- Not relevant here
Freedom	<i>Equal rights</i>			