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The Spatial Determinants of Well-Being in South African Cities

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ABBREVIATIONS

CEPD	Centre for Education and Policy Development
CoGTA	Cooperative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
EIU	Economist Intelligence Unit
GCR	Gauteng City Region
GCRO	Gauteng City Region Organisation
GHS	General Household Survey
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
HSRC	Human Sciences Research Council
IUDF	Integrated Urban Development Framework
LSM	Living Standards Measure
LM	Local Municipality
NDP	National Development Plan
NIDS	National Income Dynamics Study
NLI	Neighbourhood Living Index
NPC	National Planning Commission
NUA	New Urban Agenda
OECD	Organisation for Economic Co-operation and Development
QoL	Quality of Life
RDP	Reconstruction and Development Programme
TAT	Town Area Typology
SA	South Africa
SACN	South African Cities Network
SAIMD	South African Index of Multiple Deprivation
SAIRR	South African Institute of Race Relations
SALDRU	Southern Africa Labour and Development Research Unit
SAMPI	South African Multi-dimensional Poverty Index
SASAS	South African Social Attitudes Survey
SASPRI	Southern African Social Policy Research Institute
StatsSA	Statistics South Africa
SDG	Sustainable Development Goals
UN	United Nations
UCT	University of Cape Town
WISP	Weighted Index of Social Progress

A. OVERVIEW AND CONTEXT

1. Introduction

In accordance with its mandate, the South African Cities Network (SACN) seeks to encourage the growth of inclusive cities where all citizens can equitably reap the social and economic benefits of living in cities. To support this drive, it was considered important to gain a greater understanding of human well-being and its spatial determinants as well as any specific spatially relevant barriers or 'unfreedoms' that potentially prevent people from obtaining a high level of well-being. Well-being is commonly considered to be one of the fundamental outcomes of inclusive growth and development.

The CSIR was commissioned by the SACN to undertake a study contributing to a greater understanding of the spatial and non-spatial influences of well-being that includes objective and subjective indicators as well as the physical and non-physical contributing components that influence the well-being of different communities and places. The study, which is exploratory in nature, will propose a possible framework and indicators that can most productively be used to measure the differential well-being of residents at a sub-city level to monitor progress with respect to different components of human well-being and development. There is specifically a need for a greater understanding of what the key determining spatial factors are and whether there are any specific barriers that are related to the spatial geography of places that limit citizens in making progress with respect to improving their lives. In post-apartheid South Africa it is also valuable to explore this concept in terms of spatial justice across and within city spaces.

1.1. Background

There is growing interest and concern in the planning world regarding not just the economic and environmental health of our cities but more specifically on measuring and monitoring the social well-being and overall improvement in the lives of people in urban areas. There is clear evidence that aspects of well-being can be directly linked to the kinds of places and neighbourhood spaces in which people are born, grow-up and live in. That is, how the spatial geography of places influences the well-being of residents. A greater understanding of well-being and specifically spatial influences can be used to more effectively inform the measurement and tracking of critical components of well-being at a specific spatial level and this can in turn inform city governance and policy.

Cities have become undisputable centres of both the economic and political growth of any country and, spatially, the areas of the greatest creation of wealth and employment.

However, urban areas and cities face significant challenges that relate to the negative aspects of urban development and these include poverty, unemployment, physical and environmental degradation, social exclusion and insecurity and traffic congestion, all of which, while not being the only significant factors that determine the extent to which residents derive benefits from living in cities, do nevertheless contribute directly to low levels of quality of life (Rezvani et al, 2012). Cities are regarded as complex systems made up of different heterogeneous parts, some of which give greater support in the attainment of well-being to certain residents rather than others.

Well-being and the quality of life in urban centres are significantly influenced by the nature and quality of the type of urban development. This impacts on the living environment of city dwellers and influences their capacity to respond to their circumstances and to reap the benefits of the city. It has been noted since the 2011 census (Statistics South Africa (StatsSA), 2011) that a great deal of improvement has been made with respect to delivering basic services in many areas and that South Africa has seen a reduction in poverty levels especially though the extension of the social grants to over a third of the population in the country. Despite these efforts and despite overall improvements, on the provincial and city level South Africa continues to see an increase in inequality within spaces, especially in our cities.

The increased level of attention given to the topic of well-being is evident in the increasing importance of quality of life studies internationally in monitoring public policies and the role policies play as effective tools in urban management and planning. In addition to the development of quality of life indicators, social scientists, planners and geographers also seek to identify and understand the geographical or spatial patterns of urban life indicators in relation to human well-being and quality of life. As such, numerous frameworks have been developed worldwide to understand and measure aspects of human well-being. These include: Maslow's *hierarchy of needs*, Max Neef's *Framework on Fundamental Human Needs*, the United Nation's *Sustainable Development Goals*, the European Union Commission's *Well-Being Index*, the *Social Progress Indicator*, the *Integrated Urban Development Framework* in South Africa, as well as many other approaches that have been used to inform such frameworks, such as Sen's capability based approach *Development as Freedom*.

Well-being is often described from the perspective of the self – that is, how individuals (or sometimes households) experience a place and if that place meets the needs of either the individual or the household. From a policy perspective, it is often informed by evidence-based research and frequently follows the Organisation for Economic Cooperation and Economic Development's (OECD) eight dimensions of life. These include health, education and learning, employment and the quality of life, time and leisure, command over goods and services, the physical environment, social environments and personal safety, all of which are deemed to be essential to well-being (Christchurch City Council, 2005) and which are

measurable through statistical approaches at selected scales. The latter is largely dependent on the richness of the data sources and scale of measurement, sample size, frequency and quality of the data collection of specific countries. While some research has found links or correlations between subjective and objective well-being, this relationship is often not simple and is impacted by a range of contextual and societal factors which may or not have any spatially specific relevance. In other instances, the components of these dimensions have a clear geographic footprint, if not with respect to the input factors but as regards to where the impact is experienced. However, the scale of where the determinants or inputs are positioned and where in space the benefits manifest may not necessarily be the same and this requires careful consideration of the scale at which measurement can and should be made in order to be meaningful to policy input. This is indeed a complex and multi-facetted issue.

1.2. Purpose and relevance

A number of plans and policies in South Africa, including the National Development Plan (NDP), the Integrated Urban Development Framework (IUDF) and the New Urban Agenda (NUA) have raised the issues of spatial justice and transformation and refer to a range of related concepts or issues including quality of life, well-being, deprivation and liveability, most of which have a specific spatial manifestation. In undertaking this study, the SACN strives to contribute to informed debate and the monitoring of progress with respect to human well-being through informed evidence based city planning, It is anticipated that the research and monitoring of trends of well-being can impact policy development and public investment to achieve greater well-being, social and spatial justice and equitable access to opportunities for all.

1.3. Project scope

The main purpose of this study is thus to explore the literature and develop a comprehensive understanding of the complex range of components of well-being, to review different frameworks for understanding and monitoring well-being, and to propose and test a framework that could be used for spatially relevant monitoring and mapping of selected indicators at an appropriate spatial scale to evaluate differences of well-being within South African cities over time.

A basic study of the topic provides a sufficient indication that the well-being of citizens goes well beyond the now-outdated approach of using GDP per capita as a measure of well-being and also shows it is not only influenced by local spatial factors but includes a host of other factors both physical and spatial as well as non-physical and non-spatial. Well-being includes components of life satisfaction related to, amongst other things, freedom of movement within a city to seek employment and access to a range of social and economic opportunities but also the ability to move though space over time. Social mobility enables sequential

changes of spaces as homes are traded-up (or down or side-ways); whether from informal settlements or backyard dwellings to permanent RDP (Reconstruction and Development Programme) homes, from inner-city rentals to suburban family homes, from RDP homes to the suburbs, or from rental apartments to three-bedroom houses in leafy suburbs. These changes are dependent not only on where you were born and started life but are also related to a complex set of factors, choices, regulations, governance issues, social issues and broader economic circumstances. The literature is clear that the well-being of people is also strongly influenced by non-spatial factors such as networks, agency, role models or other intrinsic and extrinsic social factors that may either help or hinder individuals to breach spatial divides.

Different parts of the city play different roles with respect to different people and meeting different needs at different times. It is self-evident that most people are not able to meet all their needs within their own residential spaces and must travel to other areas of the city to do so (for instance, travelling to a hospital for specialist treatment). When measuring well-being, the scale at which the measurement of the different components is done or how the indicator is derived with respect to the neighbourhood's relative location in a city and its linkage to other parts of the city is thus critical. The framework developed through this project will attempt to incorporate ways to include such indicators of well-being as they impact on how residents respond to the city and the neighbourhoods in which they find themselves. It will also map a range of indictors suitable for measurement at a local scale to evaluate their suitability to understand the impact of different levels of the well-being components on well-being. The study further makes recommendations regarding future approaches that can be explored to enhance the monitoring and evaluation of this aspect of city development as it relates to differential well-being within city spaces to more fully unpack the impact of quality of places on human well-being.

1.4. Project objectives

The aim of the project is to improve the spatial monitoring of well-being in order to support the goal of transformation within South African cities. The objectives of the project include:

1. Clearly outlining the concept of well-being and its components through a literature review
2. Reviewing different frameworks for measuring well-being
3. Identifying specific spatially-determined barriers to well-being or any limits on accessing well-being development
4. Proposing a framework for evaluating spatially relevant well-being and specific indicators to provide spatial evidence of differential well-being and/or progress with respect aspects of transformation and inclusion at a suitable scale

5. Testing the proposed measurement framework for a selected case study area through the mapping of selected indicators. The study will also attempt to show how this is manifested differently across the city landscape
6. Making recommendations with regard to additional indicators or evidence of well-being to be measured, as well as how to collect the associated data. This may include:
    a. Providing recommendations with regard to alternative/additional **objective indicators** that can be gathered and indications of the appropriate scales of measurement of new indicators to reflect the different components of well-being
    b. Outlining methods for gathering subjective data of well-being that is relevant for understanding (at a minimum) city level well-being. Where necessary, proposals will be made and examples provided of alternative approaches that could be piloted or used to better establish other societal or non-physical/non-spatial factors that influence well-being
    c. Identifying any fundamental barriers to 'freedoms' that may limit access to city benefits, specifically as they relate to basic needs
7. Contributing to urban research by establishing a greater understanding of the spatially specific determinants of well-being, as well as any 'unfreedoms', through the identification of both physical and non-physical determinants of well-being.

The ultimate aim of the project is to provide an evidence base to be used for monitoring and evaluating improvements in cities by tracking their progress over time, especially with regard to the upliftment of the most marginalised parts of cities. Within this specific context, the project will contribute to an enhanced understanding of the key spatial determinants of well-being and, in so doing, inform planning interventions aimed at achieving the broader goals of spatial transformation, social and spatial justice and well-being.

1.5. Project approach

The project started with a literature study (see Sections B and C) to develop a clear understanding of the different components and aspects of well-being; particularly those that are linked to the spatial geography of places. Policy documents and institutional contexts, highlighting the most relevant or critical components for considering urban well-being in South African cities were reviewed. A historical review of previous studies related to the measurement of well-being in South Africa was also undertaken.

Based on this understanding, the project team identified which of the spatially specific components that form part of the city fabric can be measured and at what scale for the measures to be meaningful. This also considered available data sources. The study identified factors that create barriers to achieving well-being. The literature study seeks to clarify other contributing factors (non-spatial/non-physical) that may contribute to the empowerment of

citizens to make choices that enable them to be able to better reap the benefits of urban life. The project seeks to identify determinants or contributing factors that strongly reflect within the inequality of the spatial fabric in our cities.

A key focus of the literature component of this project was to explore the different understandings and components of human well-being as well the institutional context before considering a range of different monitoring and evaluation frameworks for well-being, not-all of which have been used for evaluation at a spatial level and almost none for detailing an intra-urban evaluation of well-being., most have been used for comparison at a county scale.

The research questions developed by the study are framed with respect to what factors are considered to be determining or at least related factors, and especially those that relate to the differences that exist between spaces that impact the attainment of well-being or at least a minimum level of quality of life. In addition to this, the study is framed specifically to what is quantifiable or measurable within and between city spaces. The study also aims to identify other non-spatial and non-physical factors that may be influencing or contributing factors to the attainment or non-attainment of well-being before making recommendations on how data on these aspects can be gathered should this be considered necessary (the measurement or evaluation of these non-spatial components falls outside of the scope of the current project and will require more qualitative assessment to further fully explore). The report suggests alternative approaches that may be used to more fully explore any spatial relevance especially where they are seen as critical stumbling blocks to achieving the good life. The components include, but are not restricted to aspects such as community cohesion, personal agency, family and community influences, or private sector financial policies.

The key focus will be, firstly, to refine a definition of well-being and its key components based on the literature. Within each component, any spatial determinants and relevant indicators will be identified for use within the South African SACN context as related to quality of life, well-being or Inclusivity with an indication of relative spatiality.

Based on the literature review, local circumstances and available data sources, a framework for analysis/evaluation of the major spatial determinants of well-being will be developed for discussion and testing in a case study context to the extent that available data and time will allow. The purpose is to develop a tested evaluation framework of spatially quantifiable determinants and well-being indicators that can be used for evaluating all cities in the same manner. This will be tested though mapping a range of quantitative indictors in one or more cities to test their usefulness with respect to tracking different components of quality of life/spatial justice/well-being, preferably reflected through a sub-urban level analysis. In

addition, the selected city scale indicators will be used to test and reflect variances of well-being over time for use as possible indicators of inclusivity.

The aim is to use this framework to critically assess and compare progress with respect to improving well-being and achieving a desired level of transformation. The research is intended to inform policy actions required to achieve better well-being and quality of life for all people living in urban areas, but more especially the poor and economically marginalised, and to influence key spatial determinants for patterns and programmes of action that may help cities make the shift towards more inclusive growth. The framework will also indicate other qualitative and less tangible indicators of well-being that will require different methodologies/approaches to better understand the wider range of determining factors on urban well-being.

Given the complexity of the topic at hand, the project can be considered as largely explorative in nature. It is anticipated that the project will provide a supporting evidence base for:

1. Exploring the different dimensions of well-being;
2. Understanding and assessing how and to what extent elements of the spatial environment are key determinants of urban well-being;
3. Identifying any key spatial barriers to achieving 'freedoms';
4. Identifying which spatially relevant factors which have an impact on well-being and quality of life can be used to measure and monitor progress in South African cities with respect to achieving greater inclusivity/transformation, how it can be measured and at what scale; and
5. Establishing a basic understanding of non-physical/material and non-spatial factors and choices that lead to residents not being fully able to access the city and its benefits.

1.6. Structure of the report

Before specifically reviewing spatially specific indicators and the appropriate scale of mapping in order to make meaningful conclusions, the following sections provide a literature summary of all the different components of well-being, specifically focusing on the more recent trend to more inclusive measurements of indicators that go beyond Gross Domestic Product (GDP) measures. A summary of the current South African context is provided as well as examples of previous studies and spatial mapping of indicators in the country. Following this, a brief review of alternative measurement frameworks is provided before putting forward a proposed framework for measuring relevant aspects of well-being in South African Cities that have spatially relevant influences on the well-being of people in cities. The conceptual framework for understanding well-being includes a range of factors (as explored in the literature section) such as spatial justice, access to knowledge, civic participation and

economic opportunities. In the study will also consider each data set with respect to usable indicators of well-being within specific spatial scales.

1.7. Caveats and risks

In measuring well-being and in developing a framework it is important to consider a few relevant risks and concerns in dealing with the topic of well-being (that is, the relative measures that should be taken into consideration when evaluating well-being and related concepts):

- ⇒ *While well-being can be measured, it is not a fixed target that can be reached.*
- ⇒ *Whether it relates to objective or subjective measures of the well-being of any space, it is only in the relative value compared to others or over time that it has relevance. It is likely to be a moving target.*
- ⇒ *While measurement of improvements in basic, objectively measured indicators is possible and is subject to availability at a suitable scale and level of statistical confidence, subjective well-being may remain low due to relative inequalities between people and places. It is further noted that the level of subjective well-being is likely to be inversely proportional to the distance between two unequal groups, even if the closeness to the areas of higher well-being provide higher levels of access to opportunity. (In other words, relative inequalities are likely to be more negatively perceived when people are closely related in space.) Priorities with regard to what different target groups may consider important for achieving higher levels of well-being is context specific and will depend largely on the current level of well-being attained, comparisons to others, as well as expectations and changing exposure to other cultures and socio-economic groups and life stage or even gender. Thus, measuring well-being can highlight variations in the understanding of well-being, and where and how to intervene is likely to require a great deal than just the measurement of differences.*

2. Setting the Scene (the South African context)

The historical legacy of apartheid continues to be felt in South Africa's current socio-economic outcomes. Despite significant social changes since 1994, poverty is still found in many areas of our cities and there are high levels of inequality amongst city residents. Impoverished areas and informal settlements with poor levels of well-being contrast sharply with the 'leafy well-off' suburbs. South Africa is rated as one of the most unequal societies in the world with a Gini coefficient of 0.70 in 2008, 0.65 and 0.69 in 2014 (World Bank, 2017). On the Social Progress Index Ranking, South Africa is ranked 66th out of 128 countries (with a score of 67.15 out of 100) in achieving social progress based on a wide range of indicators that form a composite score (Social Progress Index, 2017).

The imbalances in South African cities and urban areas are mostly driven by historic spatial inequalities. The spatial landscape of South Africa was socially engineered to create a racially divided spatial geography and this has had profound and long-lasting effects (Bhorat and Kanbur, 2005): inequality still remains deeply imbedded in space and in the structure of the economy and labour markets. This has manifested in unequal access to opportunities and the resultant poor human development outcomes. Distorted settlement geographies have given rise to various social problems as people are often located far from employment areas or areas of entrepreneurial opportunity. The provision of low-income housing has continued to follow the developmental patterns applied under the apartheid regime with very limited change in location of where low-cost housing is provided that can improve access to opportunity.

Furthermore, cities and towns continue to face the challenges required to address inequalities resulting from pressures and risks associated with growing populations, slower growth and lagging economies, increasing service delivery and housing backlogs, or pressures associated with livelihoods and material transformation. Metropolitan areas in South Africa (i.e. Gauteng, Cape Town, eThekwini and Nelson Mandela Bay) have become home to more than 42 per cent of South Africa's population (see Figure 1) while a further 10 per cent live in the other cities and in the very large regional service centres (stepSA Town Area Typology, 2016). Within these areas, there are huge differences in the ways in which people live in some parts of the city when compared with others. These differences are evident in access to basic services and clean water provision, housing types, levels of education, access to health care, food security, nutrition and levels of employment.

According to the World Bank (2017), South Africa has made considerable strides towards improving the material/objective well-being of many of its citizens since the mid-1990s, especially in terms of a broader distribution of basic services and social grants; however, backlogs and disparities still remain. Owing to, in part, poor macro-economic factors and rising unemployment, the gap between the rich and poor has widened. In 2011, 16.6% of South Africans lived in poverty and, according to World Bank estimates; this has barely changed as the level of poverty only dropped marginally to 15.9% in 2016. High unemployment also remains a key challenge and this is evident in SA's unemployment rate which stood at 27.3% in the 3rd quarter of 2016 and is estimated to be even higher among the youth (close to 50%) (World Bank, 2017).

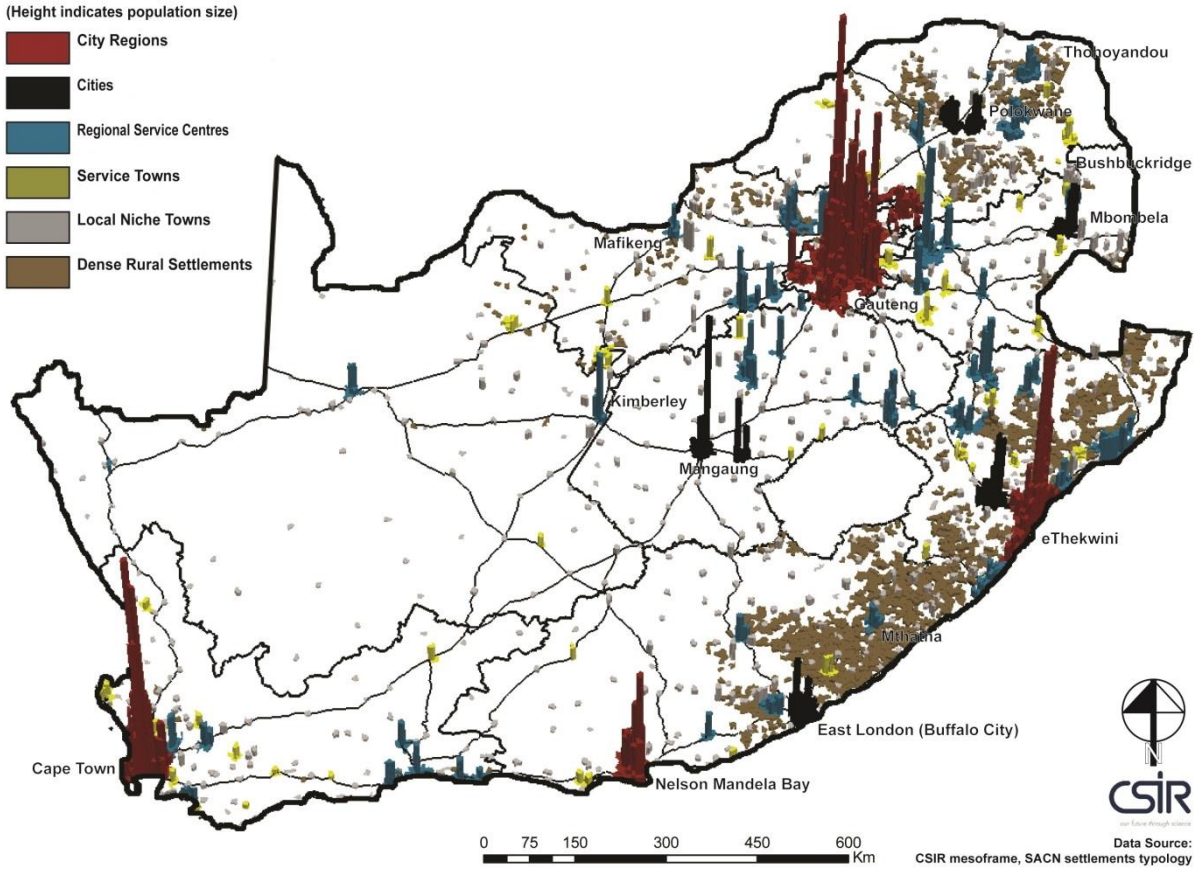

Figure 1: stepSA Town Area Typology (TAT, 2016)

Despite improved urban infrastructure (Stats SA, 2016) and progress with service delivery that directly affects the quality of life in cities and towns across South Africa (South African Cities Network, 2016), investment into disadvantaged areas and interventions to boost employment and access to services is still required**.** It is especially **critical** that in the **absence of employment opportunities** authorities ensure the other factors influencing well-being such as **access to basic services, affordable housing options, social security, safety, equal education and health, and environmental protection** are in place**,** especially in **marginalised communities.**

In the words of Philip, et al. (2014):

> In a context in which poverty directly impacts on people's lives and well-being, the question is often posed: why focus on inequality? … Inequality matters in its own right because of the ways it limits people's access to human rights, to opportunities, and on people's ability to reach their full potential. All of these impact in turn on who is most likely to be poor – and on the types of barriers they face in exiting from poverty.

The post-apartheid landscape therefore presents opportunities to examine, in depth, the dynamic relationship between inequality and space, the key spatial determinants and how this translates to the well-being of its citizens.

B. INSTITUTIONAL ASSESSMENT

3. International

There are several key international policy documents that highlight issues of well-being. These include the **New Urban Agenda** and the United Nation's **Sustainable Development Goals** where issues of heightened inequality and extreme poverty are highlighted and where the socio-economic well-being of people becomes an important consideration as a first step in dealing with the challenges. The issues addressed in these documents are likely to have specific measurable footprints.

Within the vision of developing prosperous cities that are centres of well-being, the **New Urban Agenda** (United Nations, 2016) – the outcome document agreed upon at the Habitat III cities conference in Quito, Ecuador, in October 2016 – makes a commitment to, among others, provide basic services for all people, ensure that all citizens have access to equal opportunities and face no discrimination, promote measures that support cleaner cities, promote safe, accessible and green public spaces, strengthen resilience in cities to reduce the risk and the impact of disasters, and fully respect the rights of refugees, migrants and internally displaced persons regardless of their migration status.

The Agenda also provides guidance for achieving the **Sustainable Development Goals** (SDGs) which have been developed by the United Nations and adopted by 193 countries in 2015. The SDGs are a collection of 17 goals which cover a range of social and development goals and are targeted to be achieved in 2030. They were developed to replace the Millennium Development Goals which ended in 2015. A number of the goals have an influence on the well-being of people. The broad goals are interrelated though each has its own targets to achieve and many can be measured on a sub-city scale if data is collected.

The goals speak to the eradication of poverty (Goal 1), eliminating hunger and the achievement of food security (Goal 2), ensuring healthy lives and promoting well-being for people of all ages (Goal 3), inclusive and equitable quality education for all people (Goal 4), gender equity and the empowerment of women and girls (Goal 5), clean water and sanitation (Goal 6), affordable and clean energy (Goal 7), and many more. However, for the purposes of this report, the following are the most relevant.

Goal 1 refers to poverty as more than just a result of a lack of income or resources. People live in poverty if they lack basic services such as healthcare and education – access to which is clearly a spatial determinant. The poor also experience hunger, social discrimination and

exclusion from decision making processes. According to the United Nations (2015), growing inequalities may stand in the way of the achievement of this goal.

Goal 2 of the SDGs is aimed at **eliminating hunger and achieving food security** and improved nutrition. According to the United Nations (2015), one in nine people living around the globe are undernourished, and a large proportion of these people are from developing countries. **Goal 3** speaks to ensuring healthy lives and promoting well-being for people of all ages. In pursuit of this goal, several targets have been set and significant strides have been made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. Major progress has been made on increasing access to clean water and sanitation, reducing malaria, tuberculosis, polio and the spread of HIV/AIDS. The spatial determinants in meeting these goals are linked directly to the provision of basic water and sanitation at a local level and the provision of **core basic health facilities** close to poor communities as well as the quality of services. However, many other efforts (which may not be spatially relevant) are needed to fully eradicate a wide range of diseases and address many a range of the persistent and emerging health issues that limit people's productive participation in life and the economy.

Quality education, **Goal 4**, targets the achievement of **inclusive and equitable quality education** for all by 2030. The goal refers to the importance of **access to** education and it aims at ensuring that all children, boys and girls, complete (free), equitable, and quality primary and secondary education. However, the goal also recognises that access does not always equate to quality or the completion of school (United Nations, 2015). While some aspects of this component are spatial, others are influenced by non-spatial factors such as socio-economic conditions and willingness and aptitude of teachers.

According to the United Nations (2015), providing women and girls with equal access to education, health care, decent work, and representation in political and economic decision-making processes will benefit societies and humanity at large. In many countries, gender discrimination is still woven into the fabric of legal systems and social norms. Women are also considered to be more vulnerable than their male counterparts to issues such as crime, sex trafficking and sexual exploitation. Thus, the aim of **Goal 5** is to **achieve gender equality and empower all women and girls** by 2030. While gender equality is guaranteed by the South African constitution women's equal access to opportunities remains a concern. The wage gap between men and woman is a non-spatial determinant but it does have an impact on the income of female-headed households and clusters of such households may be found in certain places in a city. In addition, the lack of childminding facilities, poor sanitation provision at schools and high crime rates in some areas can limit the participation of women and girls in society.

Goal 6 speaks to **clean water and sanitation.** The targets of the goal relate to the provision of safe drinking water and hygienic toilets with the aim of protecting people from diseases. The main indicator for the sanitation target is the "proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water" (United Nations, 2015). The goal stands out as a precursor to achieving many of the other SDGs. It ties in closely with, for example, Goal 3 which speaks to health, and Goals 4 and 8 where specific reference has been made to the importance of clean water and sanitation for undisrupted school and work. The provision of safe drinking water and hygienic toilets at homes and schools in poor areas is a direct spatial determinant of well-being and one that is easily measured and monitored at a sub-city scale in South Africa by making use of StatsSA census data.

Goal 7 which is aimed at **affordable and clean energy** aims to ensure access to affordable, reliable, and modern energy for all. Fortunately in South Africa, nearly 90% of households in the country have access to electricity (Eskom, 2016) and this is again easily measured and mapped at a fine scale of spatial data using census data. **Goal 8** targets the achievement of **inclusive and sustainable economic growth, full and productive employment and decent work for all** and it is aimed at achieving an increase of at least seven per cent gross domestic product (GDP) annually in the least developed countries. This is an indicator that speaks to the development of an entire country and is measurable at a country scale. Since cities are the main drivers of economic growth in South Africa, a growth target for each of the cities' growth may also conceivably be seven percent by implication; however, this is not an indicator that should or can be measured at a sub-city scale. Currently the economic growth rate for South Africa is less than 2% per annum.

Related to Goal 8, **Goal 10** is targeted at **reducing income inequalities** in the least developed countries. Income inequality is an indicator regularly measured at sub-city level, as evidenced by the many measures of deprivation or poverty, as it is at this level that the stark differences in spatial inequality are most evident in South Africa.

Last, but not least, of the SDGs which relate to the context of the project is **Goal 11** which is aimed at **making cities and human settlements inclusive, safe, resilient and sustainable** through **access to affordable and safe housing**. Goal 11 particularly speaks to the proportions of urban populations living in informal settlements (United Nations, 2015). This is one of the key challenges for South African cities as a large proportion of the urban poor are found in informal settlements.

The spatial concentration of informal areas and their location relative to other parts of the city can be illustrated by mapping the dominant housing types or the location of informal settlements at a sub-city scale. However, it is at a city-wide scale that it is possible to measure trends with regards to the percentage of informal dwellings as well as the growth

and decline of such settlements. It is useful to note that informal settlements per se are not necessarily “bad” in all contexts. While the provision of decent housing for all is desirable, it would appear that currently informal housing may need to be considered part of the basic housing stock for a while longer as it provides the poor migrants and the unemployed with affordable housing options mostly on the periphery of the city and provides a foothold in the city. That being said the location of informal settlements on land that is well located to opportunities in the city, together with the general upliftment of informal areas through the provision of basic services and security, can make a positive contribution to sustainable development as it provides greater choice of housing options. The formalisation of informal settlements and the recognition of informal houses as legitimate housing stock with a market value will greatly contribute to the well-being of its inhabitants. Thus, when we develop indicators in terms of inclusivity and affordable and safe housing the actual measures that can, and should, be used are complex and related to policy goals and perspectives. In fact, growth in the informal sector of a city may reflect greater access to opportunities from a national perspective in that more people have access to city opportunities, while others may see it as a negative factor indicating the cities the inability to meet housing demand. Ideally, cities that are well planned should be able to anticipate growth and provide well located land and basic services at a rate at least equal to city growth.

Indicators for consideration for achieving these goals vary for each of the goals although there may be overlaps between them. These indicators could be disaggregated by sex, age or other key groupings (race/disability/vulnerability) if required. Examples of city or sub-city level spatial indicators may for example include:

- ⇒ The proportion of people living below the poverty line;
- ⇒ The proportion of the population which is covered by social protection systems/grants;
- ⇒ The proportion of the population living in households that have access to basic services;
- ⇒ The proportion of the population with secure tenure rights to land;
- ⇒ Prevalence of undernourishment, malnutrition or food insecurity in the population;
- ⇒ The maternal mortality ratio;
- ⇒ The proportion of births that have been attended by skilled health personnel;
- ⇒ The number of new HIV infections per 1 000 uninfected population;
- ⇒ Tuberculosis, malaria or Hepatitis B incidents per 1 000 people (100 000 for Hepatitis);
- ⇒ Suicide rate;
- ⇒ Murder rate;
- ⇒ The mortality rate attributed to cardiovascular diseases, chronic respiratory diseases or diabetes;

- ⇒ The number of people who are covered by a public health system or health insurance per 1 000 people;
- ⇒ The infant mortality rate;
- ⇒ The proportion of children and young people who are at the end of primary/lower secondary school and who have achieved at least a minimum proficiency in reading and mathematics;
- ⇒ The participation rate of youth and adults in FET education and training in the last year;
- ⇒ The proportion of schools with access to electricity, the Internet, computers, sanitation facilities, safe drinking water and handwashing facilities;
- ⇒ The number of teachers with the minimum teacher training at the relevant level;
- ⇒ The proportion of women and children who have been subjected to sexual, physical or psychological violence in the last year;
- ⇒ The proportion of the population using safely managed drinking water and sanitation services, and living in areas were wastewater is safely treated;
- ⇒ The proportion of the population with access to electricity;
- ⇒ Annual growth rate of real GDP per capita;
- ⇒ Annual growth rate of real GDP per employed person;
- ⇒ Number of formal jobs available;
- ⇒ Unemployment rate;
- ⇒ Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population;
- ⇒ Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities;
- ⇒ The proportion of the urban population living in informal settlements, slums, or inadequate housing;
- ⇒ The proportion of population that has convenient access to public transport;
- ⇒ The proportion of cities with a direct participation structure of civil society in urban planning and management that operates regularly and democratically;
- ⇒ The proportion of urban solid waste regularly collected and with adequate final discharge;
- ⇒ The average share of the built-up area of cities that is open space for public use for all.

4. South Africa

In South Africa, the most important legislation, policies, frameworks and key strategic documents that start shaping the well-being agenda include **The Constitution of the Republic of South Africa** (Act 108 of 1996), **The National Development Plan 2030** (NPC,

2011), **The Integrated Urban Development Framework** (CoGTA, 2014) and the South African Cities Network **State of the Cities Reports.**

Chapter 2 of the Constitution of the Republic of South Africa is the Bill of Rights which is seen as a cornerstone of democracy and enshrines the rights of all people living in the country. It sets out the fundamental rights of all South Africans, including the right to dignity and the right to equality. According to the International Labour Organisation (2012), countries, especially those that are developing, should provide some form of "minimum" social protection to their citizens. This may refer to basic income security and access to health care and other nationally agreed public goods and services which are considered necessary for human life. The organisation further states that this form of social protection should primarily be aimed at the poor or those people who do not have the means to earn their own livelihoods. This usually includes the most vulnerable groups in society such as old people, the very young, people with disabilities and people who have remained unemployed for long periods of time.

For South Africa, in particular, the consensus around the need to work towards a minimum social protection floor is supported by a rights-based approach informed by the Constitution. This includes section 27 which determines that every South African has the right to have access to health care services, sufficient food and water and social assistance if they are unable to support themselves, and section 28 which outlines the basic rights of children (including the right to care, nutrition, shelter, basic health care and social services) some of which are the fundamental components of what the literature defines as well-being.

The Constitution of South Africa also envisages in the Bill of Rights (section 24) that "everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and the use of natural resources while also promoting the economic and social development of people". In addition to this is the right to housing (section 26) and the right to education (section 29), which, among others, have been said to have correlations with people's levels of well-being within the places in which they live.

The South African government is conscious of the immense challenges it has to overcome, especially those concerned with the social and developmental challenges it currently faces and efforts to accelerate progress and build a more inclusive society**. The National Development Plan 2030 (NPC, 2011)** comprises two main strategic goals of **reducing the inequalities** which persist in South Africa and **eliminating poverty**. It gives recognition to the **importance of space in determining the life chances** of people and their well-being. According to the NDP 2030 (NPC, 2011), the **appropriate type and location of infrastructure**

plays a critical role in this aspect. It posits that, in order to accelerate progress, deepen democracy and build a more inclusive society, South Africa must translate political emancipation into economic well-being for all. It refers to enabling milestones that include among many others, the provision of affordable **access to quality health care** while at the same time promoting health and well-being, the **creation of jobs**, albeit in low skills services, to provide families opportunities for achieving **decent standards of living**, and **ecosystems protection** with the recognition that the well-being of humans is dependent on the health of the planet. The NDP 2030 acknowledges that despite population shifts from rural to urban areas, the health and well-being of the entire population still depends on rural goods and services – food, water, minerals, energy, biodiversity, natural and cultural experiences, labour and land. According to De Wet (2017), the successful implementation of this plan is critical for South Africa to address low economic growth and the challenges of unemployment, poverty, income inequality and skill shortages.

The Integrated Urban Development Framework (CoGTA, 2014), which speaks to coordinated **investment in people and spaces**, implies that in order to transform the quality of life in specific communities investment in not only the economy but the environment, as well as in people (basic services and social development), is essential. To achieve these transformations, these investments must work together and be spatially aligned. Accordingly, taking such an approach will ideally result in urban spaces that contribute to the growth and development of the country, encourage inclusive growth, respond to social developments, place local participation and ownership at the centre of city development, build social cohesion and promote good governance, can create jobs and support diverse livelihoods and activities, provide universal access to social and other services and contain accessible public green spaces and affordable housing.

The **State of the Cities Reports** acknowledges the importance of the economy in the growth of cities and the challenges associated with exclusion in cities as well as the consequences of this exclusion. According to the SACN (2016), spatial transformation is a must for cities to become more inclusive, sustainable and productive. As mentioned in the previous section, the spatial construct of South African cities remains inefficient and heavily segregated because of the legacy of apartheid and, as a result, many people who live in cities are still faced with challenges such as expensive and long commutes, which affect mostly the poor who usually live in peripheral areas. As such, the pursuit of achieving greater inclusivity is one that is critical in assisting those who remain spatially, socially, and economically excluded.

5. Common threads and trends

It is evident that cities and urbanisation have been receiving a great deal of attention in both academic and policy arenas, and rightly so. Urban development is considered central to the transformation that the world has seen over the past few centuries and, as such, cities have been drivers of economic growth and the very centres that foster higher levels of material well-being. They can also, sometimes simultaneously, heighten inequality and extreme poverty – this being evident more especially in cities where substandard housing, unemployment, crime and environmental degradation are widespread, and often located in close proximity to areas of prosperity, which heightens the perception of spatial inequality.

The preceding sections have drawn attention to some key concepts that characterise well-being development contained in policy documents and urban development programmes. They dealt particularly with how well-being has been addressed in major international policy instruments and highlighted areas where specific references to well-being have been made in key South African policy documents. From these international and local policy documents, the emergence of the common factors that have an influence on the well-being of people living in cities and that have the potential to affect the well-being of individuals starts to become evident. Emphasis has been given to issues such as access to services, health, education and housing, almost all of which have specific spatial footprints in different parts of our cities.

It is clear from this section that attempts have been made to include well-being issues in policy directives – with similarities in issues existing in both international and local frameworks. Because of the complexity of well-being as a multi-dimensional concept and the dynamics and issues around which it is evaluated and measured, it is noteworthy that although bridging the gap between measures and policy intervention cannot be an easy task (OECD, 2017), their consideration in the policy-making processes is essential and a step in the right direction for measures to start making a real difference in the lives of people. The next section of the report explores the broader literature of well-being and its components.

C. FRAMING WELL-BEING

This literature review aims to provide reflections on the key components of well-being. It will specifically focus on those that are considered to relate to the spatial determinants of well-being. It also provides examples of best practice frameworks that have been developed for measuring and monitoring the different components of well-being around different parts of the world as well as in South African cities. Whilst this project addresses well-being, there are a number of specific related concepts that speak to improving the well-being of citizens such as quality of life, liveability and multi-deprivation that need to be considered before developing a comprehensive understanding and definition of well-being in the South Africa context. The literature review provides an outline of the relationships between various related concepts and the different ways each has been conceptualised and can (potentially be) measured. It also reflects on the purposes for which these measures have been used.

6. Well-being and related concepts

6.1. Well-being defined

There have been many attempts at defining the concept of well-being and several definitions have emerged from the literature review. Consensus on how the concept should be defined has not been reached – this stems mainly from its complex and multi-dimensional nature that, according to El Dina et al (2013), requires "multiple approaches from different theoretical perspectives". The reason for this is largely the different purposes for which different measures have been created and used to measure well-being.

The most comprehensive definition of well-being includes measurements of quality of life but goes further to include both subjective and objective indicators of well-being. Alatartseva and Barysheva (2015) define the objective aspect of well-being as being more directed towards measuring material well-being and quality of life. This is influenced by factors such as the conditions of the housing people live in, the opportunity of having education and its quality, the quality of the social and natural environment, safety and security, and the level and stability of income. The inclusion of subjective well-being on the other hand refers to "a person's cognitive and affective evaluations of his or her life" (Alatartseva and Barysheva, 2015) – that is, how one feels about one's life and the quality of one's life/material well-being. It is a measure that is considered as relative to the levels of material well-being/ quality of life, as well as other aspects such as freedom of choice and the use of time.

The Organisation for Economic Cooperation and Economic Development (OECD, 2017) provides one of the best developed and comprehensive definitions of well-being and describes well-being as "**a description of social progress in terms of improvements in quality of life, material conditions and sustainability**" (OECD, 2017); whereas, Keul and Prinz (2011) define socio-economic well-being particularly as the status of a household where the basic social and economic needs for survival are fulfilled and the household has the capacity to **improve** its quality of life. The latter excludes any qualitative evaluation of life satisfaction measures.

Geographers such as Bhatti et al. (2011) have expanded the concept of well-being to include subjective and emotional components and indices and describe well-being as the ability of people to access the things they need in order to live happy, healthy and content lives. Whether a person is born in a rural area, in a township, a coastal city or a large metropolitan city should not matter: their basic needs to live a good life are the same. These basic needs include access to clean and safe drinking water and sanitation, a secure food supply, shelter (housing) and safety (as highlighted in international and local policy documents). Once these basic needs have been met, secondary needs, such as good health, the ability to make a decent living and access to education, become important in determining an individual's level of well-being.

A more inclusive definition is provided by Stiglitz et al. (2009) who argue for the importance of the considering a multi-disciplinary approach when it comes to defining well-being. The Stiglitz report was published following the 2008 financial crisis and great recession that ensued. The book frames the economic crises as part of a series of simultaneous occurring crises related to water, food, energy and sustainability. Based on academic research and a number of concrete initiatives developed around the world, the authors have identified **material living standards; health; education; personal activities including work, political voice and governance; social connectedness and relationships, the state of the environment (both present and future); as well as economic and physical insecurity as key dimensions** that should be taken into account. All of these shape people's well-being and yet have been missed by conventional income measures. This definition, given the spatial landscape and challenges of access to basic services that exist in South Africa, becomes relevant to the local context and is more in line with what has been put forward in terms of well-being in South African policy documents.

The socio-economic characteristics of a neighbourhood or community play a very significant role in establishing the levels of well-being of an area (Albrecht and Ramasubramanian, 2004); although, strictly speaking, we may be actually speaking about quality of life rather than well-being. These authors reference this by using an example of the higher likelihood of low-income individuals finding opportunities they would not otherwise have in adulthood by living in relatively affluent neighbourhoods as compared to those living in resource poor

neighbourhoods. The authors ascribe this to **improved levels of access to material and cultural resources** that may otherwise not be available in resource poor neighbourhoods. They refer to these opportunities as **'bridging capital'** which can be described as the connections that occur between individuals with unrelated backgrounds.

6.2. Gross Domestic Product

Until recently, Gross Domestic Product (GDP) was used by most countries as a measure for determining the levels of development and human well-being. According to Di Tella et al. (2010) and Stiglitz (2009), GDP is highly effective as a measure of local economic activity; however, the measure is not able to capture and provide the full range of social, economic and environmental realities that continue to affect people. It specifically does not reflect individual variances. Therefore, GDP only provides a partial picture of societal progress and it measures only aspects of economic production to the exclusion of other factors such as individual levels of health and education (as these are assumed to be directly related to levels of GDP). In other words, it provides a quantitative assessment of economic growth – it does not provide enough information on the qualitative aspects of that growth. So according to authors Di Tella et al. (2010), measures such as GDP cannot account for and reflect on the inequalities that may be underlying economic progress. Household income would provide a much better measure to identify individual differences but it is useful to note that it also does not account for other measures such as health, education, and community support, to name but a few.

The Social Progress Index is one of the many frameworks which is moving away from measuring GDP only and instead includes social and environmental elements. It has been found, when comparing the 2017 Social Progress Index with the levels of GDP per capita for different countries that there were "widely divergent levels of social progress, even at similar levels of GDP per capita" (Porter et al., 2016) (this report will refer back to the Social Progress Index in later sections). Influential thinkers such as Amaryta Sen (1999) see increasing income as only one of the means of advancing development and not as the primary development goal. For instance, Sen believes that the basis of evaluation of a society's success should relate to human freedoms, and development should aim at removing the major sources of 'unfreedom' (of which poverty and lack of economic opportunities are only some aspects) (Sen, 1999). As a result, there has been a growing interest in adopting alternative indicators for measuring and assessing economic or societal progress and/or well-being.

6.3. Quality of Life

The other main related concept is that of quality of life which is often used interchangeably with the term well-being. The concept of quality of life started gaining prominence around the 1960s and over the following decades the efforts to study it have expanded to include

developing countries. El Din et al. (2013) dates this as far back as 384–322 BC when philosophers like Aristotle wrote about 'living well' and referred to 'the good life' and proposed ways in which public policy could assist in achieving this. Quality of life measures are considered to be very important in determining the liveability of an area and ultimately the well-being of its citizens. According to Das (2008), urban quality of life can be seen as "a concept that has the challenge to solve the problems of urban areas, to control urban sprawl and to prevent environmental deterioration."

Quality of Life has been described in the literature as referring to enhanced daily living through access to clean air and water, wholesome food, the availability and enjoyment of public open space, the conservation of natural resources and wildlife, protection from pollution and security from crime and many other factors that are said to have an impact on human well-being and which will be discussed in more detail in the following sections. In addition to these, it includes satisfaction with social aspects such as safety and security, education and social integration, the protection of public health and the promotion of equality in terms of respect for cultural diversity (El Din et al., 2013) – some of which may be spatial and some non-spatial.

This definition by implication assumes that people have homes, food and jobs which is often not the case in many developing countries, especially in South Africa where the provision of sufficient access to these is one of the many critical challenges facing the current government. Quality of Life is, therefore, dependent on spatial aspects such as land use patterns, transportation availability and quality, the quality of public open spaces and opportunities to partake in recreational activities, population and building densities, the ease of access to basic goods and public amenities as well as the quality of services and environment.

6.4. Liveability

A concept related to well-being is liveability. The term has been used to refer to conditions that contribute to **making communities places that are good to live in** and have primarily been used as a tool to rate and make comparisons between cities according to the **perceptions** of their citizens (Woolcock, 2009).

Authors Zanella et al. (2015) make mention of Vuchic (1999), who is the most commonly cited author for his views on the liveability of urban environments. Vuchic interprets urban liveability as encompassing all of the elements within the places which people live that contribute to people's social and economic opportunities, their well-being, safety, health and mobility. From this understanding, according to Zanella et al. (2015), liveability can therefore be described as the human requirement for social amenity, health and well-being and it includes both individual and community well-being. As such, it is seen as being a

different side of well-being and can be related to how easy a place is to use or comfortable to live in as well as to how safe it feels.

In Australia, Melbourne has clearly been the city that has embraced the liveability approach fully. The city established a full investigation on the concept of liveability on behalf of the Victorian Competition and Efficiency Commission (2008). Through the large number of submissions to the inquiry, the Commission (2008: 10), in examining definitions of liveability, identified a number of common elements and developed a working definition of liveability. The Commission defined liveability as a reflection of the well-being of a community and further mentioned that it comprises the many characteristics that make a location a place where people want to live now and in the future (Victorian Competition and Efficiency Commission, 2008). There is, however, no consensus on what constitutes the crucial conditions of a liveable community (Van der Pas et al., 2015). In urban planning the focus is particularly placed on the natural and built environments as important criteria for good urban living; that is, the elements that contribute to making an urban area liveable (i.e. an area that is healthy, safe, affordable, attractive, provides good accessibility and is environmentally sustainable) – as can be understood from the definitions of Vuchic (1999) and Zanella et al. (2015). The concept speaks more directly to measures of high quality places as being high attractors of people rather than the living levels of individuals; although, these are mostly directly related but many include more qualitative indicators such as the amount of free time people have.

According to Van der Pas et al. (2015), in South Africa, the **home environment** (with consideration for factors such as basic household amenities, the composition of households, household income and safety in the home) and the **neighbourhood environment** (the accessibility of appropriate services, the availability of support organisations, safety and walkability) may be seen as important contributors to the levels of liveability of areas. The research suggests that the home environment is a particularly important component of liveability given discourses about the supportiveness of large multi-generation households in the face of evidence of deprived living conditions (Van der Pas et al., 2015).

6.5. Multiple deprivation

Multiple deprivation has been defined as the lack of adequate food, shelter, or education, high crime levels and high unemployment. Authors Noble et al. (2009) define it simply as people's unmet needs. Because well-being is dependent on critical factors, such as good health, an adequate income, the fulfilment of basic and secondary needs, multiple deprivation is the non-existence or the lack of such factors. Deprivation can therefore be considered as a barrier to achieving well-being.

An Index of Multiple Deprivation provides a relative measure of deprivation, often on a small area level but also covering entire countries. It has been used to measure poor quality of life

in places such as England and Wales and in South Africa, at a ward, municipal and provincial level, where higher scores represent more deprivation and therefore lower quality of life and lower well-being, although paradoxically not necessarily lower life satisfaction.

6.6. Life satisfaction

Life satisfaction is a concept that is also considered to be an aspect or measure of well-being. It is a term used to consider the degree of individual or household perceptions and feelings towards their lives at a given period of time and is typically measured using surveys which use scales that range from positive to negative feelings. According to Ng (2015) life satisfaction is closely related to subjective well-being and happiness in that it has been found that many surveys that have been conducted on the topic tend to offer very similar results, but with some reported differences. Rojas (2004) notes the various approaches that can be taken to assess life satisfaction and particularly places emphasis on the domains-of-life approach which considers life satisfaction as the result of the level in which individuals or households are satisfied in the various domains of their lives. As with the concepts discussed in the sections above, these domains may include education, health, safety, aspects of material well-being, productivity, personal and community networks and emotional well-being, to name but a few, and some of which are associated measurable spatial aspects.

6.7. Common aspects of well-being and related concepts

Although the definitions of the concepts discussed above differ to a greater or lesser extent, they all speak to people's ability to access the things they **need** in order to live happy, healthy and productive lives, as well as in some cases their personal satisfaction with their lives. This has been reiterated as important in many policy documents (see Section B). The definitions usually consist of (1) an environmental (physical) context; and/or, (2) a psychological milieu (perception of the place). They thus include situations or conditions that are perceived by an area's residents and translated by them into varying degrees of a sense of well-being. These two aspects, the psychological (often implicit in nature) and the physical environment, need to be considered at the same time in order to effectively understand well-being, yet they rarely are (Wish, 1986). A key issue to note is that people's subjective evaluation of their satisfaction with their life is of necessity relative to others and may be strongly influenced by specific events in their lives. Some authors such as Woolcock (2009) argue that it may not be possible or even necessary to establish a uniform definition of well-being, quality of life, or liveability as they are complex multidimensional "container concepts."

7. Approaches to measuring well-being

7.1. Introduction

Literature points to several ways in which different indicators which contribute to aspects of well-being can be measured and mapped. This section of the document will look at some of the ways in which this has been done by examining some of the indicators that have been used. In some instances, the literature points out how these indicators and methods can be applied to measure the differences between places. Much of the earlier work that has been done in measuring well-being has been conducted at larger scales (national, regional or city level) and there has been very little done with regard to spatial evaluations at detailed scales such as within different city areas or between cities or towns (Hagerty et al., 2001). This section of the report places specific emphasis on those components and indicators which can be considered to be determinants of well-being and, in particular, those that have a spatial relevance.

Components of well-being or quality of life are measured either by using quantitative (objective) indicators, such as those related to the urban environment, and/or qualitative (usually subjective) indicators that are usually derived from surveys of people's perceptions, evaluations and satisfactions about the places or conditions in which they live (Hataminezhad et al., 2008). In essence, it can be said that quantitative or objective indicators allow for measurable and accurate comparisons that are related somewhat to material and objective well-being but can show improvement or decline over time, whereas the qualitative or more subjective indicators provide descriptions of people's perceptions of their living conditions rather than providing objective measurements.

Well-being indicators can be grouped into certain categories such as economic, social, environmental, health, political and technological (as will become evident in the later sections of the report). According to Hataminezhad et al. (2008), by measuring GDP together with housing, occupation and wealth, and balancing these with other well-being indicators (such as education, employment rate, health status, work/life balance, civil engagement), a broader picture of well-being can be obtained. Using national, regional or local statistics is one way of measuring the differences in well-being between different places as well as between the individuals living within those places. Statistics are also an important tool for government and non-governmental organisations to inform and direct actions as a response to these discrepancies in well-being (Hataminezhad et al., 2008).

7.2. International approaches

There have been many types of indices that have been developed by many different kinds of institutions to measure specific aspects of the performance of countries and cities. These have included objective and subjective measures in various combinations and the weighting

of indicators. Although not a comprehensive list, the following illustrates several different approaches used internationally to measure a range of different aspects and views of what could generally be considered as well-being.

The United Nation's **Human Development Index** (HDI) is a composite indicator developed by measuring the education, health and living standards of countries worldwide, and uses data sources relating to life expectancy at birth; mean years of schooling; expected years of schooling; and average national income. This Index recognises that gross national income (GNI) is "a means to human development, and not the end. The GNI per capita reflects average national income. It does not reveal how that income is spent, or whether it translates to better health, education and other human development outcomes. Comparing the GNI per capita rankings and the HDI rankings of countries can reveal much about the results of national policy choices." (United Nations, 2016). The HDI is a summary measure of average achievement in key dimensions of human development that include a long and healthy life, being knowledgeable and having a decent standard of living. It is the geometric mean of normalized indices for each of the three dimensions included. They use life expectancy at birth as the key variable of health and unfortunately information is not readily available as a data variable at the census ward level in South Africa). The education dimension is measured by the average years of schooling for adults aged 25 years and above while the standard of life is measured by gross national income per capita. The HDI simplifies what human development encompasses but does not reflect on inequalities, poverty, human security, empowerment, etc. Thus other more complex indices have been constructed to address inequality, gender disparity and poverty which have led to some countries using the inequality-adjusted Human Development Index, the Gender Inequality Index and Multidimensional Poverty index (MPI) (mostly used in developing countries). See section 2.3 with regard to the use of MPI in South Africa

Bhutan's Gross National Happiness Index was developed in Bhutan in 1972 from a call to measure society by the connectedness of the people as well as their education and health instead of using conventional material measures. There are many similar indices such as the **Genuine Progress Indicator** and the **Happy Planet Index** which ranks a total of 151 countries using measures such as experienced well-being, life expectancy, as well as ecological footprint and gives each country an individual score assessment out of 100. **The World Happiness Report** was first produced in support of the United Nations High Level meeting in April 2012, and since then has been produced almost annually (The World Happiness Report, 2017). It uses the Gallup World Poll data and other sources such as the World Values Survey to rank 155 countries by their happiness levels and has identified six factors which account for most of the differences in reported happiness:

- ⇒ GDP per capita;
- ⇒ Healthy years of life expectancy;

⇒ Generosity (measured by the number of recent donations);
⇒ Social support (having someone to count on in times of trouble);
⇒ Freedom to make life decisions; and
⇒ Trust (the perceived absence of corruption in government and business).

The **Gallup Wold Poll** country-level questionnaire provides measures of 14 areas or domains. These are citizen engagement, social diversity, health, education and family, food and shelter, safety, religion and ethics, emotional well-being, work, business and economics, government and policies, transport, communications and technology, as well as the environment and energy (The World Happiness Report, 2017).

There is huge interest in measuring well-being in the **United Kingdom** (Drabsch, 2012). The prime minister, in 2010, commissioned the Office for National Statistics to develop a national measure of progress and well-being and these include both subjective and objective measures of well-being. Some of the indicators used can be accessed via its website (https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing) and include components such as health, personal well-being and relationships, personal finances, where people live, what people do, the economy, skills and education, governance and the natural environment (Drabsch, 2012).

In **France**, where the Stiglitz report originated, well-being was considered important to measure in the categories of education, health, employment, environment, material well-being, political engagement and interpersonal connectedness. For the economy, it was recommended that measures should rather consider consumption and income instead of production, that income should be considered together with wealth, that emphasis should be placed on the household level of income and that prominence should be given to the distribution of consumption (Drabsch, 2012). With regards to quality of life, the report notes the significance of subjective well-being indicators in providing key information about the way people perceive the quality of their lives at a specific time and the importance of these indicators in revealing inequalities in a comprehensive way (Drabsch, 2012).

The Economists Intelligence Unit (EIU) in the United Kingdom, a corporation that provides country, industry and risk analysis in over 200 countries across the world, uses a **Where-to-be-born Index** (known previously as the quality-of-life index). This index uses the results of surveys determining life satisfaction (qualitative measures) together with 'determinants' of quality of life (objective measures) to forecast which countries will provide the best quality of life in future. This index covers about 80 countries and looked at components (with the actual measures in brackets) such as:

⇒ Material well-being (GDP per capita);
⇒ Health (life expectancy);
⇒ Family life (divorce rates);

⇒ Political freedoms;
⇒ Job security (the unemployment rate);
⇒ Climate (changes in temperature & months with low rainfall);
⇒ Security (personal ratings of risk for crime and terrorism & homicide rates);
⇒ Community life (social organisation membership);
⇒ Governance (ratings of corruption); and
⇒ Gender equality (share of parliament seats held by women).

These components were specifically chosen as they are regarded as being able to explain 85 per cent of the variation between different countries' life satisfaction scores (Wikipedia, 2018).

In the **United States of America**, the development of a key national indicator system has recently been passed into legislation (Drabsch, 2012). This system incorporates social, economic, and environmental measures that will be used to measure national progress.

In **Canada**, the well-being index comprises 64 indicators which fall into the categories of living standards, education, health, democratic engagement, community vitality, environment, time use, as well as leisure and culture. According to Drabsch (2012), the indicators used are indicative of the values and needs of the people living in Canada. These can be viewed on the Canadian Index of Well-being website (https://uwaterloo.ca/canadian-index-wellbeing/what-we-do/domains-and-indicators).The examples that have been mentioned up to this point all point to national, country level measures and assessments of well-being.

On a more local level, a well-being index was computed through a series of five steps in **Los Angeles**. Potential data sources were first identified and census data was ultimately chosen as the data source. Then the spatial unit of analysis was determined and identified block groups selected as the elementary unit of analysis. On this, principal component analysis was performed and the absolute numbers from the census data were converted to percentages, which were standardised and weighted to create block scores. The types of variables used in the study include income support, disability, home ownership, overcrowding, educational attainment, parental status, poverty status, vehicle ownership, unemployment and whether household have access to a telephone at home (Bhatti et al., 2017).

In another study conducted in Salzburg, an Austrian city, the impact of environmental factors on urban quality of life was examined and the quality of life was observed through GIS using household survey data (Keul and Prinz 2011). The study also examined the spatial variations and relationship of the quality of life with different factors such as social and biophysical, economic, environmental and crowdedness, population density, household density, amenities and economic performance (Keul and Prinz 2011). Another study conducted by Abdullah et al. (2013) demonstrated the use of GIS-based methods to

understand the contribution of five factors (education, health, employment, industry and transportation, and communication) towards overall quality of life.

The **Economist Intelligence Unit** in the UK has also assessed the living conditions in cities worldwide through using around 40 indicators (EIU, 2010). Each city is ranked in terms of their liveability by the use of scores with values between 1 and 5 for each indicator. Following this, they are grouped into weighted categories to allow for a rating of 0 to 100 percent to be determined for each city – with a lower score referring to higher liveability levels. The categories (with their weighting in brackets) are as follows:

- ⇒ Stability (25%) – measures prevalence of violent crime, prevalence of petty crime, threat of terrorism, threat of civil unrest/conflict, etc.;
- ⇒ Education (10%) – includes measures around quality of private education provision, availability of private education, and other general indicators related to private education;
- ⇒ Healthcare (20%) – availability of public and private healthcare provision and other general indicators related to healthcare;
- ⇒ Culture and the Environment (25%) – includes climate (humidity/temperature rating, discomfort to travellers, cultural hardship), corruption, social/religious restrictions, level of censorship, recreation (sports, culture, food and drink), availability of consumer goods and services, etc.; and
- ⇒ Infrastructure (20%) – measuring transport (quality of road network, quality of public transport, quality of regional or international links), housing (availability of good quality housing), and utilities (quality of energy provision, quality of water provision, quality of telecommunications infrastructure).

In **New Zealand**, quality of life reports were published in 2001, 2003 and 2007. These reports focus on the quality of life and the well-being of people living in New Zealand's cities and examine a total number of 68 indicators across 11 categories: people, housing, living standards, safety, the natural environment, civil and political rights, economic development, knowledge and skills levels, the built environment, health as well as social connectedness (Drabsch, 2012).

The **City of Sydney** on the other hand, according to Drabsch (2012), has developed a list of close to 100 community well-being indicators for measuring and tracking well-being in that city. The framework that was used for this index uses the following categories:

- ⇒ Inclusive, healthy and safe communities;
- ⇒ Vibrant and culturally rich communities;
- ⇒ Resilient and dynamic local communities;
- ⇒ Democratic and engaged communities; and

⇒ Sustainable environments (Drabsch, 2012).

The City of Sydney Indicator Framework recognises that for many of the domains the factors being considered are interrelated and their allocation to one domain rather than another is not strictly objective and exclusive.

7.3. Well-being and deprivation measures in Africa and South Africa

There have been many attempts at measuring well-being and quality of life in South Africa. As Valerie Møller states in her review of the use of social indicators in Africa (Møller, 2017), Africa may be a "latecomer to the Social Indicators Movement" but has been successful in developing its "own home-grown indicators". Future research into well-being (and its measurement by social indicators) should, in her view, be aimed at **monitoring the social changes** brought about in African societies by globalization and the digital revolution. Although African countries have been ranked using composite social indicators, Land and Michalos (2015, as cited in Moller, 2017) have noted that the ability of these to reflect well-being still requires a review to determine which are the most influential ones that should be used (Møller, 2017).

A recent and comprehensive review of research undertaken to measure well-being across **sub-Saharan countries** specifically looked at how effective different objective, subjective and composite indicators were in revealing well-being (Roberts et al., 2015). Although these indicators were analysed on a country-wide scale, they point to important relationships between objective factors and subjective well-being that would also have relevance on citywide or even lower scale measurements of well-being. The United Nations Development Programme replaced its Human Poverty Index in 2010 with the **Multi-dimensional Poverty Index (MPI)** to address the issue of a lack of income as not being sufficient to measure human deprivation and not always being directly related to perceived well-being.

The MPI was adapted to a South African context by StatsSA to develop the **South African Multi-dimensional Poverty Index (MPI)** that uses ten indicators which are grouped under the following three dimensions: health, education and living standards. This uses similar components to the Multi-dimensional Poverty Index but has been adapted since the data values are not available down to a ward level.(*http://hdr.undp.org/en/composite/HDI*). The index uses child mortality for the health indicator; years of schooling and school attendance for the education indicator; the following indicators are used for the living standards dimension: fuel for cooking, fuel for heating, fuel for lighting, sanitation, dwelling type, access to water and asset ownership. StatsSA provides a clear breakdown of how the index was developed but to date has not made the values available at a ward level, but is expected to do so in future meaning that as yet we can use it to compare this over time at the fine

grain. The Index was tested on national and municipal levels and it compared the levels of multidimensional poverty between 2001 and 2011 using census data (Roberts et al., 2015).

Happiness and democracy have been found to be positively linked (Dorn et al. 2007 in Roberts et al. 2015) and Freedom House's **Political Rights and Civil Liberties Indices** have measured access to basic political rights. The Political Rights Index provides scores relating to fair and free elections, citizen's political autonomy and basic political rights, while the Failed State Index measures the stability and strength of governments, and the Corruption Perception Index (Transparency International) rates the corruption of governments. Safety and security is measured by the Global Peace Index (Institute for Economics and Peace) which has 22 indicators.

Since 2002, StatsSA has been conducting annual **General Household Surveys** (GHS) aimed at determining the progress of development in South Africa by assessing the extent of service delivery and the quality of services in a number of key service sectors in the country. These include education, health, disability, social security, religious affiliation and observance, housing, energy, access to and use of water and sanitation, the environment, refuse removal, telecommunications, transport, household income, access to food, and agriculture. Some topics covered, such as religious affiliation and observance, are totally new, whilst others, such as education, were deepened by focusing on access to work and textbooks. The main objective of GHS is to provide the government and private sector with population and household statistics at a municipal level to support planning and decision-making (StatsSA, 2016). The frequency at which the surveys are provided can be advantageous in monitoring the country's progress but the scale (municipal scale) associated with the surveys is a major drawback for the purpose of this study that aims to explore differentiated well-being at sub-city scale.

The **Afrobarometer** surveys have found that most nations in sub-Saharan Africa support multi-party democracy, and that less than half of people were satisfied with the political leadership of their country, but that many felt patriotic towards their country. These can be considered as important aspects relating to some components of well-being (Roberts et al., 2015). Roberts et al. (2015) then looked at 'multi-dimensional, multi-indicator indices of progress' used in sub-Sahara Africa: the most important being the United Nation's **Human Development Index** (HDI) and the **Weighted Index of Social Progress** (WISP – developed by Richard Estes). The HDI ranks three core human development components by using several indicators, presented here in brackets behind the specific component: living a long and healthy life (health – life expectancy at birth); acquisition of knowledge (education – expected years of schooling for school-age children and average years of schooling for adults); and, a decent standard of living (income – GNI per capita). Concerns that the high inequalities that exist between and within countries are not being properly represented in the HDI ratings and the averaging effect of the index led to the development of an

inequality-adjusted index, the WISP, which incorporates decreased human development arising from inequality in the HDI's three components (Roberts et al., 2015). Roberts et al. (2015) believe that the WISP is "one of the most comprehensive measures of objective well-being". Its 41 social indicators aim to measure the most important characteristics of socio-economic development (such as educational status, health, gender equality, social welfare, and cultural diversity).

Roberts et al. (2015) looked further at the use of subjective indicators to measure well-being of which the following are the most pertinent here: the World Value Survey series (using a life satisfaction question with a ten-point scale); the Gallup World Poll and the Pew Global Attitudes Surveys (but with relatively small sample sizes); the aforementioned Afrobarometer (which does not directly measure subjective well-being but does use proxy measures); and, the World Database of Happiness. Commonly, happiness is measured by using a ladder scale of 11-steps (derived from Cantril's work) ranging from the worst life imagined to the best life imagined. The Gallup World Poll also asked people about their feelings on the day before they were interviewed, and from this, constructed a positive experience index and a negative experience index.

South Africa has had its own social indicators movement since the 1980s, guiding social policy and using both objective and subjective indicators (Roberts et al., 2015; Møller, 2017). Møller (2017) has divided these into several categories of social indicators:

- ⇒ Objective social indicators –
    - Statistics SA (using EA level data);
    - Institute of Race Relations' South Africa Survey (published annually and covering the quality of life domains of the economy, public finance, employment, income, infrastructure, education, health, social security, living condition, communications, crime and security, and politics), this data is however not spatially explicit.
- ⇒ Subjective social indicators –
    - The South African Social Attitudes Survey (SASAS) (an annual survey by the Human Sciences Research Council (HSRC) on public opinions which also tracks the Personal Well-being index);
    - The South African Quality of Life Trends project (cross-sectional study tracking the life satisfaction, happiness and perceptions of South Africans from 1983 to 2010, sampled by race and not by place).
- ⇒ Composite social indicators –
    - These provide reports on social progress that judge the performance of political leaders and local authorities. One example being the Good Governance Africa Index which looked at municipal service delivery.
- ⇒ Longitudinal panel study –

- The National Income Dynamics Study (NIDS) by the Southern African Labour and Development Research Unit (University of Cape Town) which is conducted every two years and looks at changes in poverty and well-being levels but is only valid at national and provincial spatial level.

⇒ State of the Nation reports –

- In-depth and independent analysis of the national agenda by the SACN, including that of social progress and national well-being.

⇒ The Afrobarometer –

- The Afrobarometer survey covered 36 African countries in 2015 and provides information on African attitudes and satisfaction with their individual situations and their country on dimensions of living levels, the economy, and other key concerns at country level.
- The Ibrahim Index of African Governance incorporates the Afrobarometer survey data but covers all African countries at country level.

Since 2003, the **South African Social Attitudes Survey** (SASAS) has been annually monitoring the social, economic and political values of South Africans. The survey involves creating a representative sample of 3 500 to 7 000 individuals aged 16 and above regardless of nationality, which are geographically dispersed across the country's nine provinces (HSRC, 2016). Each SASAS round of interviews consists of a sub-sample of 500 EAs drawn from the Human Sciences Research Council's Master Sample (a sampling frame that consists of 1 000 population census enumeration areas). Although SASAS provides 'frequent' surveys at a fine level (EA), the sample size is considered too small to use for evaluating spatial differences in well-being at a sub-city scale.

The **South African Quality of Life Trends study** established the reliability and validity of 35 global and domain-level indicators to use in surveying the well-being of South Africans in three surveys conducted by the HSRC up to 1995. After the HSRC stopped its survey activities, MarkData was commissioned to include three of the most important global indicators of well-being in their surveys on an ad hoc basis. These were measured by asking respondents, in face-to-face interviews, questions relating to life satisfaction (How satisfied are you with your life as a whole these days?); to happiness (How are things these days, are you happy?); and perception of progress/expectations for the future (Is your life getting better or worse?) [The questions have been paraphrased here for reasons of space]. Two more indicators were added to the 2010 study to determine future life satisfaction (How will you feel in ten years' time?) and comparison with past life circumstances (Are you better or worse off today than 10 years ago in terms of your living conditions?). These subjective indicators supplement the objective indicators of well-being that formed part of the MarkData surveys and included information relating to demographics (the urbanisation rate, life expectancy, Grade 12 education); livelihoods (monthly earnings, unemployment, the

proportion of the population living in poverty); and access to services (the presence of piped water in dwellings, electricity for lighting, landline telephone, cellular phone, bank account, medical aid coverage).

After the five indicators had been calculated for the overall sample and the four racial groups, the measures of well-being were correlated with race, certain demographics and the Living Standards Measure (LSM) Index (which uses 27 indicators of access to modern amenities and services as well as urbanisation to rank people on a standard of living measure). Indicators of subjective well-being and global happiness were found to be strongly correlated with each other as well as with material life circumstances, with most South Africans in 2010 feeling that their quality of life would be improved by basic necessities, higher incomes and employment. The LSM was the measure most strongly associated with all the subjective well-being measures; the higher one's LSM and thus standard of living, the happier and more satisfied with life one was and the more likely that personal goals and broader societal values became more important to one (e.g. the environment, the economy). As Møller (2012) states: "The LSM that characterises distinctions in material well-being emerged as one of the most consistent correlates of all five measures of subjective well-being." [It should however be noted that this was for a period up to 2010 and this may change in future if the material well-being of people, particularly blacks, continue to improve.] Education as a means for a better life was strongly expressed by black youths in the surveys (Møller, 2012). Note that although the LSM indicator will no longer be produced there is sufficient information on how this was developed for other to continue to create this index as required. In addition, the Neighbourhood Living Index (NLI) has recently been developed to replace this index and is more comprehensive in its underlying indicators used for this composite index. For example, it also includes aspects such as the debt burden of households. This index has yet to be correlated and tested against well-being approaches and frameworks.

Although blacks expressed the most dissatisfaction and unhappiness of all the groups in terms of their present lives, when they thought of their future well-being they were the most positive of the race groups (Møller, 2015). Of the top eight aspirations, seven were common to all race groups, thus most of them have been included in the framework development (i.e. education, a job, a house, decent standard of living, children and grandchildren, happy family life, entrepreneurship), but employment was a much more important aspiration for black and coloured respondents while life chances for children and grandchildren and less crime were most important for white and Indian respondents. Hopes and fears for the country also showed much commonality among the four race groups, with seven of the eleven top hopes and seven of the top nine fears being shared. Common national hopes – mirrored in the fears of respondents – are national unity (as opposed to political instability and economic decline), crime and a lack of law and order, unemployment,

declining living standards, dishonest government and poor leadership. The percentages of the different race groups expressing these fears and hopes differed widely with, for instance, only 13 per cent of whites mentioning unemployment but a third of black respondents voicing this concern. Multiple level concerns were raised on both the personal and national levels related to law and order, education, quality of public health services. Møller's use of Cantril's methodology of using a Ladder-of-Life rating showed that this was a relevant and robust measure of South African well-being ratings (Møller, 2015). New themes identified by Møller in relation to social indicators are listed in the text box.

New themes emerging relating to social change in Southern Africa and social indicators (Møller 2017):

- Influence of digitized/social-media
- Education as means to secure jobs and escape from poverty
- Youth as prosperity drivers and entrepreneurs
- Going beyond conventional demographics to understand social values and goals (traditional vs secular/rational, survival vs emancipation)
- Human agency: social concerns and strategies to enhance well-being in developing countries (e.g. survivalist modes, legal/illegal strategies)
- Income inequalities
- Generational inequalities (demands for free education & youth unemployment)

The **Personal Wellbeing Index** found that the lowest scores of satisfaction were given to material domains (e.g. standard of living, life achievements, future security) but that more importance was accorded to sources of 'social insurance' and aspects such as spirituality-religion, health, and personal relationships and connections to the wider community (Roberts et al., 2015).

On the macro-level, the following interesting associations were found by Roberts et al. (2015) between objective and subjective well-being in sub-Saharan Africa: national income was positively associated with life satisfaction and contentment but not affective (mood) measures that can be seen as a reflection of happiness (supporting the paradox that more income does not mean greater happiness); and that inequality was negatively associated with happiness especially life satisfaction and contentment; overall life satisfaction was not strongly associated with political freedom but that people living in countries with progressive political rights and civil liberties did have more positive emotions and life contentment; and, life satisfaction and positive emotions were positively correlated with perceptions of low levels of perceived corruption. (Roberts et al., 2015).

The material living conditions of many South Africans have improved considerably since 1994, but rising expectations and aspirations have meant that racial groups in South Africa still have very different overall ratings of their happiness and life satisfaction (Møller, 2015). An investigation by Noble and Wright (2012) looked into what people living in informal settlements thought were the basic necessities that everyone in South Africa should have. The study showed that people's perceptions of inequality and the groups against which they referenced their own living standards meant that people living in urban informal settlements

were “more likely to define many of the items relating to service delivery as essential than those living in rural former homeland areas” and it was hypothesised that this was because urban residents “have a more immediate and direct exposure to higher standards of living than those living in rural former households” (Noble and Wright, 2012).

The Southern African Social Policy Research Institute (SASPRI) developed the **South African Index of Multiple Deprivation (SAIMD)** and income poverty measures to be used at a ward level and lower – datazone level – to investigate deprivation and poverty (Noble et al., 2015). These have been used by national, provincial and city authorities to target specific areas for intervention and support. The SAIMD measures different domains of deprivation which are then weighted and combined into one measure of overall deprivation but the domain measures can still be used as separate indices of deprivation if required. The measures may be on a household level or an individual level. Census data of 2011 was used for the SAIMD 2011 which was based on the domains identified by the SAIMD 2001 stakeholder consultation process (except for the health domain as the 2011 published data did not support this). Besides basing the indicators on consultation and previous research, the indicators were selected for being comprehensive, strong indicators, appropriate and statistically robust. The following is a list of the domains (the indicators used to measure the domain appear in brackets):

- ⇒ Material deprivation domain (households with no refrigerator; no landline phone or cellphone; no television or radio);
- ⇒ Employment deprivation domain (people aged 15 to 64 who are unemployed – using official definition; people aged 15 to 64 who are discouraged workers);
- ⇒ Education deprivation domain (people aged 18 to 64 who have no schooling at secondary level or above); and
- ⇒ Living environment deprivation domain (people without an adequate water supply, or access to an adequate toilet, or without electricity for lighting, or living in a shack).

The figure below (Figure 2) is an example of a multi-deprivation index at ward level using 2011 figures (Noble et al., 2015). It shows areas with different levels of deprivation, with those shaded in hues of blue being the most deprived areas and those shaded in yellow the least deprived. In this particular instance, it is mostly previously disadvantaged areas, such as those found on the periphery of cities and former homeland areas, that are most deprived. This work is being expanded on by SASPRI and a study in Cape Town that will be completed in 2019 improves on this index by validating the indicators through a focus group survey. This is a valuable approach to consider and it may be useful to use this index as a proxy of well-being and test the other indicators of well-being against this in future (personal communication with Prof Michael Noble, 2 February 2018). The study uses the census data

for 2011 as its key source, once again meaning that the index leaves a gap with respect to changes in development in the past seven years.

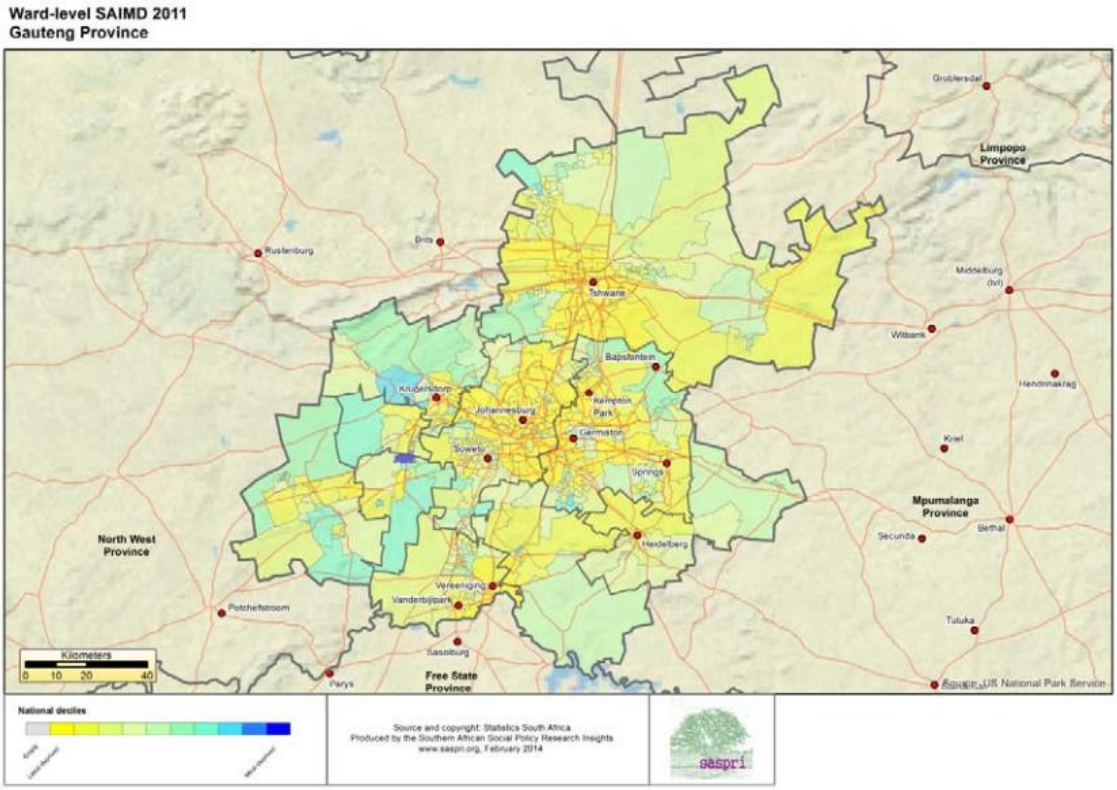

Figure 2: South African Index of Multiple Deprivation in the Gauteng Province (Noble et al., 2015)

The **National Income Dynamics Study** (NIDS), undertaken by the University of Cape Town (UCT) and funded by the Department of Planning Monitoring and Evaluation (DPME), surveys the same sample of South African households every two years on a nationwide basis and collects data on their health, nutrition, education and employment status. The surveys started in 2008 and include questions relating to people's subjective welfare (their perceived quality of life). Respondents are asked whether they feel that their consumption relating to specific household needs (food consumption, clothing, housing, children's schooling, health care, access to transport) is adequate or not. Quantitative measures such as the weighing and measuring of respondents (to track the health of people) are also undertaken. The survey allows for the tracking of people moving to other areas and changes in their quality of life, especially the "triggers that lift people out of poverty or plunge them into it, that push people through the middle class" (UCT, 2016).

The NIDS study evaluated the key aspects of poverty (over four waves to date) that go beyond income to include a range of aspects from employment to social grants. Aspects

measured included poor health, education and living standards which all contribute to deprivation. Income poverty and SAMPI (South African Multi-dimensional Poverty Index were used to calculate multidimensional poverty while money-metric (income) poverty that benchmarks income per person in each NIDS household against a poverty line (that is fixed in terms of rands per person per month) was also evaluated. Although SAMPI poverty was found to be lower than income poverty across the four waves of surveys, those who are considered chronically poor in terms of a range of dimensions are also income-poor (UCT, 2016). This indicates that far more people have moved out of SAMPI poverty than income poverty. The SAMPI is a useful proxy for measuring access to education, health and services such as water and energy, but this index may also have selected shortcomings for monitoring purposes according to some and is not yet available for use on a ward level. It is hoped that this longitudinal panel study "will serve as the basis for a more nuanced understanding of economic welfare in the country; one that is informed in a more democratic manner by drawing on the views of ordinary citizens" (Roberts, 2009). Although the sample covers households in all nine provinces, it was not designed to be representative at a provincial level (the sample sizes are too small) and thus should not be analysed on that level or lower.

An index to measure social cohesion, the **Social Cohesion Index**, has been developed as part of the Poverty and Inequality Initiative's research NIDS data (UCT, 2016). The index measures trust, inequality and identity at a municipal level and uses five dimensions of social cohesion namely: inclusion; belonging; social relationships; participation; and legitimacy (South African Labour and Development Research Unit, 2018). This is undertaken at a local municipality (LM) level and uses mostly StatsSA data correlated with selected NIDS questions. Questions relating to life satisfaction in the past, present and future allow for measures of optimism as well as declines in perceived quality of life.

The South African Institute of Race Relations (SAIRR) released the latest findings of its provincial level **Quality of Life Index** in May 2017 (SAIRR, 2017). It is updated annually and allows for the benchmarking of progress in improving living standards in South Africa by comparing indicators across the nine provinces and the four major race groups. Each of the 10 indicators used have been translated into a score of between 0 and 10. An aggregate score is then given for each province and race group revealing the overall quality of life for that province/race group. The weighted indicators are:

- ⇒ The matric pass rate:
- ⇒ Employment (based on the expanded definition, which includes people of working age who did not have a job and were available for employment);
- ⇒ Monthly expenditure levels of R10 000 or more;
- ⇒ Household tenure status (households who have a bond);
- ⇒ Access to piped water;
- ⇒ Electricity for cooking;

⇒ Basic sanitation;
⇒ Frequency of waste removal;
⇒ Medical aid coverage; and
⇒ The murder rate.

This Index does not include measures of subjective well-being and only covers basic and objective measures of well-being.

The **Gauteng City Region (GCR) quality of life survey** has been conducted bi-annually by the Gauteng City Region Organisation (GCRO) since 2009. Over this period the sample size has increase from 6 636 to over 27 000 respondents. Although the sample size is relatively small the sampling techniques used have been statistically validated to ensure robustness of the indicators at ward level. The survey is structured around 54 variables which are combined into 10 categories or dimensions of quality of life. It covers "topics such as basic services, satisfaction with government, transport and mobility, livelihoods, local community and neighbourhood dynamics, health and well-being, migration, as well as political and social values and attitudes" (GCRO, Quality of Life Survey, 2017). The dimensions measured in the GCRO Quality of Life index are:

⇒ Global life satisfaction;
⇒ Family;
⇒ Community;
⇒ Health;
⇒ Dwelling;
⇒ Infrastructure;
⇒ Connectivity;
⇒ Work;
⇒ Security; and
⇒ Socio-political attitudes.

Some of the measures used in this assessment include number of victims of crime in the last year, trust in government, food security, and a marginalisation index. The survey is conducted at ward level and attempts to not only measure overall quality of life but also the drivers of its increase or decrease as well. The survey enable spatialisation of the results to enable visualisation of which areas in the region experience higher or lower levels of quality of life using a combination of by social demographics and other variables (the results can be viewed via the GCRO Quality of Life Survey Viewer found online at http://gcro1.wits.ac.za/qolviewer/). See Figure 3 for an example of the survey results which represent a combined index of Quality of Life. This index takes into consideration the following variables:

- Victims of crime in the last year;
- Not enough food to feed children;
- Nobody cares about people like me;

- Cannot influence developments in the community;
- The country is going in the wrong direction;
- Dissatisfaction with local government performance.

This combined index may be useful to explore spatial differences within Gauteng; however, at this stage it has not been possible to download the index values or recreate it from the raw data revived.

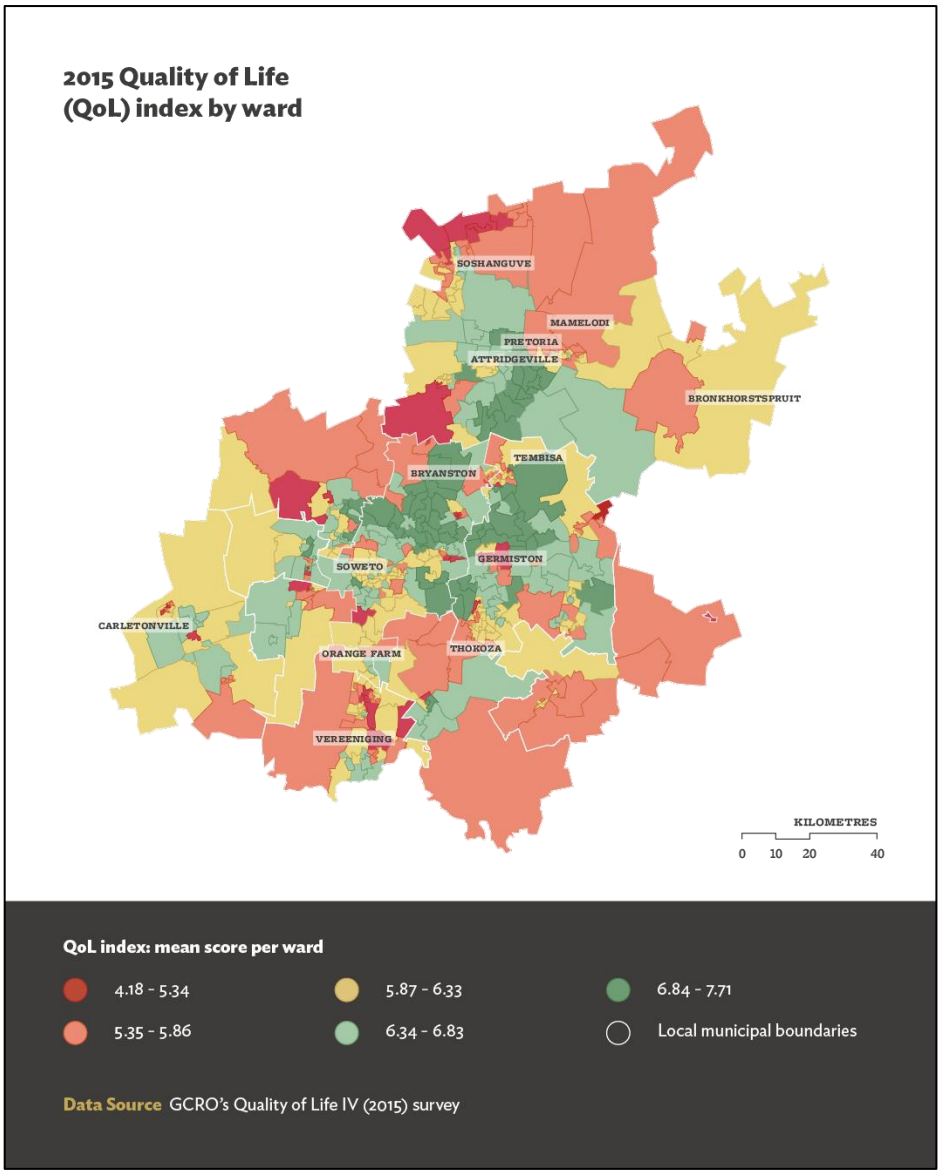

Figure 3: GCRO 2015 Quality of Life Index by Ward (GCRO, 2017)

According to Everatt (2013), and as referred to earlier, many people in South Africa were subject to life in townships during Apartheid and although for some staying there has remained a matter of choice this is not universally the case. Currently the median suburban house prices in Gauteng are twenty-two times the median average household income in the

province and, as such, many South Africans remain locked in these townships or RDP housing. Despite the constitutional freedom to relocate, the economic freedom to exercise this choice is not available to most. The GCRO Quality of Life surveys attempt through the surveys and analysis to understand these locale-specific dynamics within the city region. Although cost of property is not specifically mentioned in the literature as associated with low levels of well-being, the purchase price of property as well as the cost of residential rental rates is a spatially specific influence on the freedom of choice of housing for most city dwellers. The rapid rise in property prices and high interest rates are a major deterrent for the poor and even well-educated young people in freely choosing where to live in a city to limit travel costs or optimise other components of well-being in South Africa.

eThekwini (Durban), from a quality of life survey perspective has been ranked as the South African city with the highest levels of quality of life. eThekwini Council has conducted an annual Municipal Services and Living Conditions Survey (MSLCS) since 20111/12 and this is now in its 6th cycle (eThekwini 2016-17). The purpose of the survey is to supply municipal decision makers with a clear understanding of residents' perceptions of their living conditions, their satisfaction with municipal services and with their neighbourhoods, and their satisfaction with the quality of their own lives. The survey has a very small sample size in comparison to the GCRO study and in the last cycle surveyed 1 195 households. The survey uses indicators of municipal performance, transport links and accessibility, crime and safety indicators, health, education, housing, access to household and community services, employment, household income and finances, leisure time, as well as overall life satisfaction and personal well-being. The study is, however, not sufficient to show spatial differences at a sub-city level because of its small sample size and is only valid for use on a municipal level. No evidence of similar studies for other South African cities was found but this requires further investigation.

The Council for Scientific and Industrial Research (CSIR) developed a set of socio-economic indicators for **State of the Cities Report Spatial Analysis Support in 2016**, which although not directly aimed at measuring well-being could provide insight as to how cities have been performing in terms of social progress and spatial justice. These measures were calculated based on either the Census 2011 census data or the change in the variable between 1996 and 2011 Census data set. The variables analysed included a Remoteness/Accessibility Index which measures the magnitude of the burden (measured in travel time in minutes by an average vehicle) to access a range of functions and services (public and private sector) as well as livelihood opportunities; household poverty which shows the number of households that are living in poverty by settlement type; and, other spatial change indicators such as change in employment/unemployment, and energy poverty that provides a measure of a lack of access to modern energy services, especially for low income households in South Africa (see Figure 4). All of these measures consider key factors and determinants of well-

being that have been outlined in earlier sections of this report and would therefore be useful for consideration in developing a well-being index for South African cities.

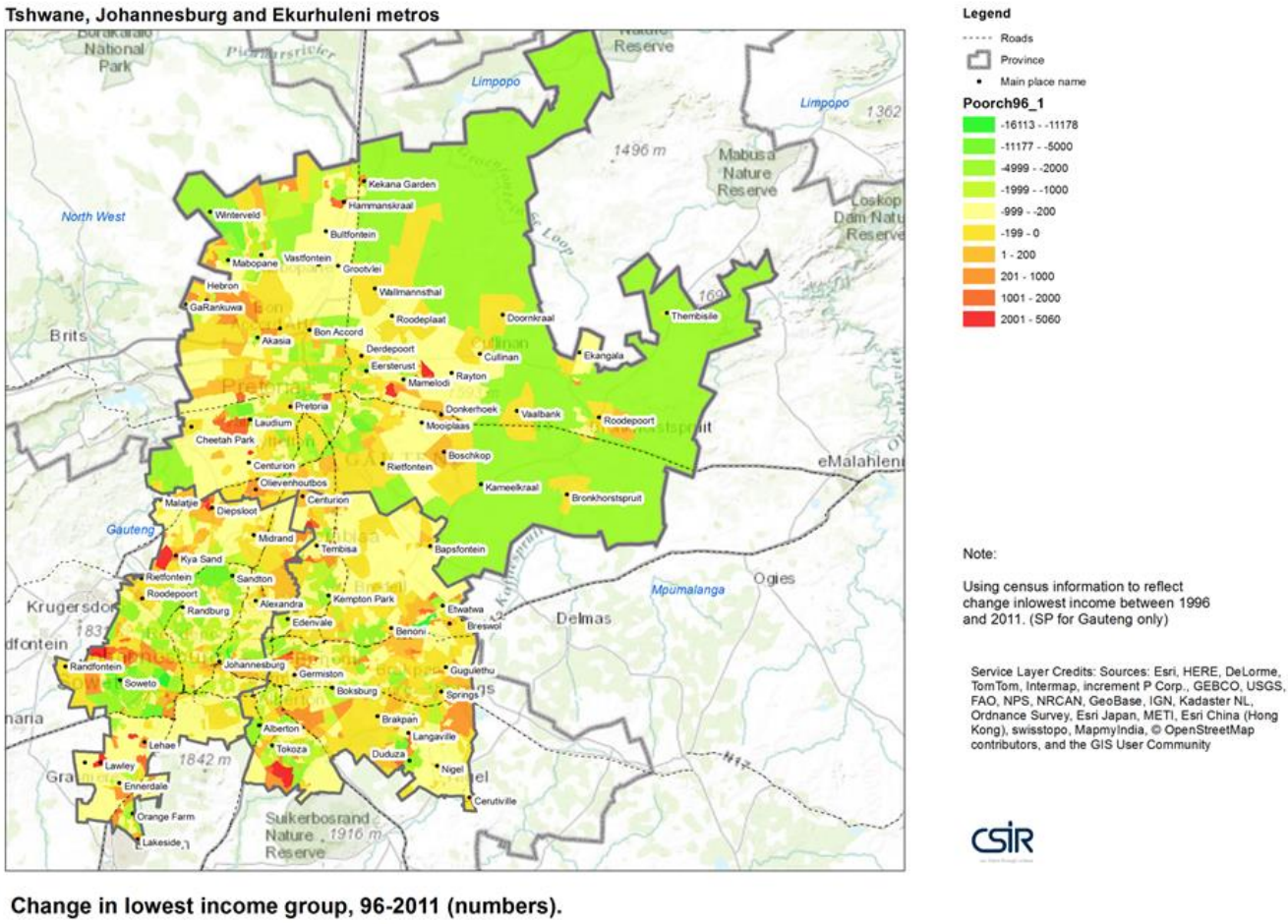

Figure 4: Change in percentage of households living in poverty, 1996 to 2011 (CSIR, 2016)

With respect to spatial or geographic measurement, a range of previous indicator projects have mapped a host of indicators that can be considered to be aspects of objective well-being that measure components of quality of life, income, basic needs, deprivation and poverty. In South Africa it has been possible to map some of these indicators at a sub-city scale as relevant indicators at a fine scale (such as the Statistics South Africa Enumerator Area level data). The problem in this case is the infrequency of the survey (every 10 years) and the age of the data especially as we move further away from the last 2011 Census. Other surveys more closely akin to the measurement of social well-being have been undertaken more regularly and include some that have been done over a long period of time but these are only statistically valid at a national level. These include (1) Quality of Life Surveys (Møller, 2017), which were racially but not spatially stratified; (2) the National Income Database (NIDS) that makes it possible for national or at best provincial level analysis of indicators and a few at a municipal level (with lower statistical confidence); (3) Social

cohesion and inequality studies which have relied heavily on data from other surveys. Some surveys have been conducted at the city level scale such as the Gauteng City Region and eThekwini quality of life surveys; however, sample sizes are much smaller and cost of the surveys are high.

8. Some examples of framework approaches for well-being

The literature represents well-being and quality of life as an interconnected relationship between various domains. A domain can be defined as a high level conceptual grouping of indicator areas (Sydney, 2016). According to the literature, the suggested dimensions of well-being and urban quality of life aim to guide and assist public policy makers, urban planners and designers to increase the urban quality of life of the neighbourhoods and communities. As outlined below, these dimensions are grouped differently by various authors in the literature. This section provides a summary of a range of existing measurement frameworks of well-being as found in the literature.

The most basic framework is Maslow's Hierarchy of Needs. It provides a description of the needs that are considered important for humans within a hierarchy of attainment; the more basic needs must be met before the higher order needs can be satisfied. Maslow argues that failure to have these needs met could lead to decreased levels of (mental) well-being. It considers basic physiological needs relating to water, shelter and clothing, as well as safety needs and the need for community and belonging as the basic building blocks of quality of life (Maslow, 1943). All of these are factors feature in most of the subsequent frameworks of well-being and have been incorporated into well-being measures.

A landmark study was conducted by Day (1987) on the quality of life which examined indicators as they related to 13 broad domains of quality of life. These domains included material possessions, working life, religion/spiritual life, family life, social life, self-development, health care, personal health, shopping/consumption of goods and services, leisure/recreation, life in the country, and government at various levels.

Another study, cited in Bhatti et al. (2011) by Wang (1993) assessed the quality of life experienced in Singapore. This study uses 12 domains relating to the living environment, life in general in Singapore, health care services, personal health, material possessions, social life, spiritual and family life, working life, leisure, self-development, school life, the acquisition and consumption of goods and services and mass media.

The European Union has a great deal of literature available on well-being and well-being indicators. For instance, the Office for National Statistics in the UK (Office for National Statistics, 2017) has a section on their website solely dedicated to measuring national well-being. It provides measures of well-being in terms of different domains, and the measures

focus on areas such as education, skills, health and relationships. The domain of personal well-being, for example, looks at overall life satisfaction, whether people are happy, anxious, and their levels of mental well-being. In terms of relationships, it attempts to measure feelings of loneliness, whether people have spouses or friends and family they can rely on, and the proportion of the population who feel extremely unhappy in their relationships. The health domain deals with measures such as life expectancy rates, the percentage of people who have reported disabilities, satisfaction with personal health and evidence of indications of depression and anxiety. In terms of what people do, the Office considers unemployment rates, the number of people who are satisfied with their jobs and the amount of time they have available for leisure, the number of people who are involved in volunteering activities as well as those who are involved in recreational activities, including participation in sports (Office for National Statistics, 2017).

Measures which the Office considers to have a spatial aspect include measures of crime (proportions of the population who feel safe walking alone after dark for both men and women) and measures of access to the natural environment as well as to nearest key services (measured as the average minimum travel time). It also includes subjective measures such as the individual sense of belonging within communities as well as the levels of satisfaction households have with their accommodation (www.ons.gov.uk, 2017). In addition to these domains, is that of the economy (measured by disposable income, public sector net debt as a percentage of GDP, and the inflation rate), personal finances (which measures median wealth per household, real median household income, satisfaction with household income, etc.), education and skills (UK residents aged 16–64 with no qualifications), human capital, and the percentage of those not in education, employment or training), governance (voter turnout in UK general elections and the proportion of the population who have trust in the government), as well as the natural environment (total greenhouse gas emissions, number of protected areas, energy consumed from renewable sources and the amount of waste that is recycled from households) (www.ons.gov.uk, 2017).

The well-being index in Canada is based on five domains: community vitality, education, living standards, healthy populations and democratic engagement (Michalos et al., 2011), while in the State of Australian Cities framework, they include a number of socially focused categories, namely: population growth and change, liveability, and social inclusion. In New Zealand, a quality of life framework consisted of 11 domains, seven of which might be considered to have a broadly 'social' focus, namely: people, knowledge and skills, economic standard of living, housing, health, safety and social connectedness (Bhatti et al., 2016).

The Social Progress Indicator, a country-level, internationally developed, aggregate index of social and environmental progress is used to measure social progress. It defines social progress as "the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow citizens and communities to enhance and sustain the quality of

their lives, and create the conditions for all individuals to reach their full potential" (Social Progress Index, 2017). It uses three main dimensions to group the indicators: meeting basic human needs; foundations of well-being; and, opportunity. Each dimension has four components and these components each have between three to five specific outcomes-based indicators. In total, the indicator comprises about 50 indicators. The basic human needs dimension has indicators related to water and sanitation, shelter, basic medical care, nutrition, and personal safety; the foundations of well-being dimension deals with access to basic knowledge and information and communications, health and wellness and environmental quality; whereas opportunity, on the other hand, considers personal freedom, rights and choice, inclusion and tolerance and access to advanced education. These are summed up in Table 1.

The City of Sydney measures well-being through a **Community Well-being Indicators Framework** (Sydney, 2016). The framework reflects a broad range of factors that contribute to well-being - quality of life and material living conditions, including health, housing, work, income, education, social connections, safety, and the quality of physical and natural environments. The Indicators Framework (Sydney, 2016) is a suite of over 100 indicators across five key domains namely: culturally rich and vibrant communities; inclusive, safe and healthy communities; sustainable environments; resilient and dynamic local economies; and democratic and engaged communities.

On the other hand, the **Organisation for Economic Co-operation and Development (OECD) Framework** for measuring well-being progress has been built around only three distinct domains: sustainability, quality of life and material conditions, each with its own relevant dimensions (OECD, 2017), and where quality of life is regarded as only one component of well-being. The dimensions for quality of life include skills and education, work-life balance, health, governance and civic engagement, subjective well-being, personal security as well as environmental quality. Material conditions are measured through wealth and income, employment and housing while sustainability considers human, social, natural and environmental capital.

Table 1: Social Progress Indicator: Dimensions and Indicators (Social Progress Index, 2017)

Basic Human Needs	Foundation of Wellbeing	Opportunity
Nutrition and Basic Medical Care • Undernourishment • Depth of food deficit • Maternal mortality rate • Child mortality rate • Deaths from Infectious diseases **Water and Sanitation** • Access to piped water • Rural access to improved water source • Access to improved sanitation facilities **Shelter** • Availability of affordable housing • Access to electricity • Quality of electricity supply • Household air pollution attributable deaths **Personal safety** • Homicide rate • Levels of violence • Perceived criminality • Political terror • Traffic deaths	**Access to Basic Knowledge** • Adult literacy rate • Primary school enrolment • Secondary school enrolment • Gender parity in secondary enrolment **Access to Information and Communications** • Mobile and telephone subscriptions • Internet users • Press Freedom Index **Health and Wellness** • Life expectancy at 60 • Premature deaths from non-communicable diseases • Suicide rate **Environmental Quality** • Outdoor air pollution attributable deaths • Wastewater treatment • Biodiversity and habitat • Greenhouse gas emissions	**Personal Rights** • Political rights • Freedom of expression • Freedom of assembly • Private property rights **Personal Freedom and Choice** • Freedom over life choices • Freedom of religion • Early marriage • Satisfied demand for contraception • Corruption **Tolerance and Inclusion** • Tolerance for immigrants • Tolerance of homosexuals • Discrimination and violence against minorities • Religious tolerance • Community safety net **Access to Advanced Communication** • Years of tertiary schooling • Women's average years in school • Inequality in the attainment of education • Globally ranked universities • Percentage of tertiary students enrolled in globally ranked universities

In Bhatti et al (2016), six domains were considered for the assessment of Quality of Life in urban areas. These include: physical health, psychological, social relationships, environment (natural and built), economic condition and development, and access to facilities and services. In El Din et al. (2013), the dimensions of Quality of Life are: social urban quality of

life, economical urban quality of life, environmental urban quality of life, physical urban quality of life, mobility urban quality of life, political urban quality of life and psychological urban quality of life. The authors represent these in a heptagon shape (Figure 5) to illustrate the interrelationship between them. This figure is also useful in that it highlights the multi-dimensionality and, therefore, the complexities of evaluating well-being and Quality of Life. According to El Din et al. (2013), well-being is the outcome of the interaction of these dimensions or the relationships between them.

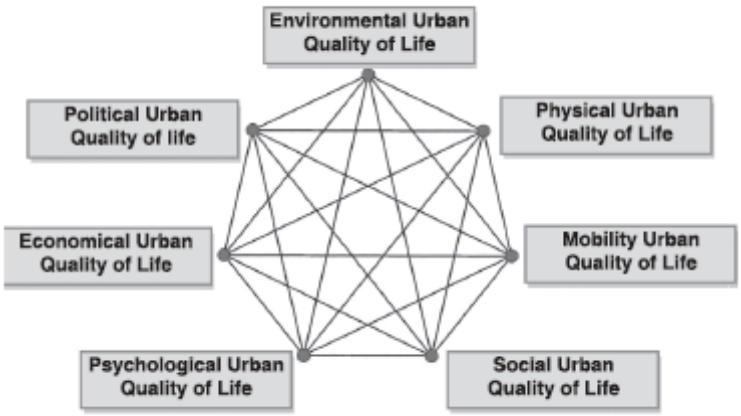

Figure 5: Dimensions of Urban Quality of Life (El Dina et al, 2013)

Some of the measures may not be directly relevant to measure in the current South African context; however, they do include domains related to health, education and income, and unemployment which are relevant (Neff, 2006). However, specific indicators of quality of life in the study by El Din et al (2013) that can be seen as being very similar to certain issues addressed when referring to well-being, particularly in South Africa, can be identified as follows:

⇒ Social urban quality of life which speaks to social justice and equity by providing equal access to affordable housing, economic activities, services and facilities; the removal of all barriers that reduce the participation in daily life of certain social groups, such as those with disabilities, women, children and the elderly; the reinforcement of safe environments through the appropriate design of streets and buildings; the promotion of social integration by providing a broad range of housing types, tenure types and prices levels; the promotion of good relationships and daily interaction among people by providing civic buildings and public gathering places; the promotion of liveability of streets by providing safe, comfortable, interesting streets and squares to the pedestrian; as well as the promotion of neighbourhood stability by ensuring secure tenure.

⇒ Physical urban quality of life refers to compact neighbourhoods that offer mixed used and pedestrian walkability, the provision of access to adequate services and facilities that fulfil people's needs, and the provision of well-defined streets and open spaces by a well-structured neighbourhood layout.

⇒ Mobility urban quality of life refers to the provision of alternatives to using cars to reduce traffic load, minimize air pollution and conserve energy, the provision of places for activities of daily living and transit stops within walking distance to allow independence to the elderly, young and those who do not drive, and the provision of a fine road network interconnecting streets to encourage walking.

⇒ Environmental urban quality of life for example refers to the promotion of environments that have clean air, water, and land, and use of non-toxic materials. Its aim is to protect people and maintain biodiversity, preserve resources and minimise energy demand by making use of energy saving technologies, as well as to allow people to enjoy the natural landscape through the provision of a range of green areas distributed within a neighbourhood.

⇒ Psychological urban quality of life refers to the promotion of community identity by preserving heritage and historic remains, designing architecture and landscape that responds to their context, providing the opportunity for people to have a place of their own by allowing the ability to personalize the space, and promoting a pleasing milieu by enhancing the urban-aesthetic character of the built environment.

⇒ Economical urban quality of life speaks to the provision of job opportunities and promotion of local business by supporting locally owned stores and business, as well as by encouraging mixed use development and minimising the cost of living through promoting access to affordable housing, services and facilities, whereas political urban quality of life speaks to the promotion of integrated urban governance and community involvement in local government decision making.

Benner and McGranahan (2017) present an **Inclusive Economies Framework** (see Figure 6), which is made up of five broad dimensions, 15 sub-categories and 45 indicators. This has been tested in India, South Africa and Columbia and has the following dimensions:

- equitable (with a focus on upward mobility, reducing inequalities and equating access to basic goods and services);
- growing (job opportunities, improved material well-being and economic transformation);
- participatory (participation in markets, market transparency, etc.);
- sustainable (social and economic well-being, reduced natural resource usage as well as greater investments in environmental health); and
- stability (e.g. economic resilience to shocks and stresses).

According to Turok and Visagie (2017) these are all key features of the spatial dynamics of inclusive development in South Africa and several may present a good basis to use for considering which indicators to use in a Well-Being framework.

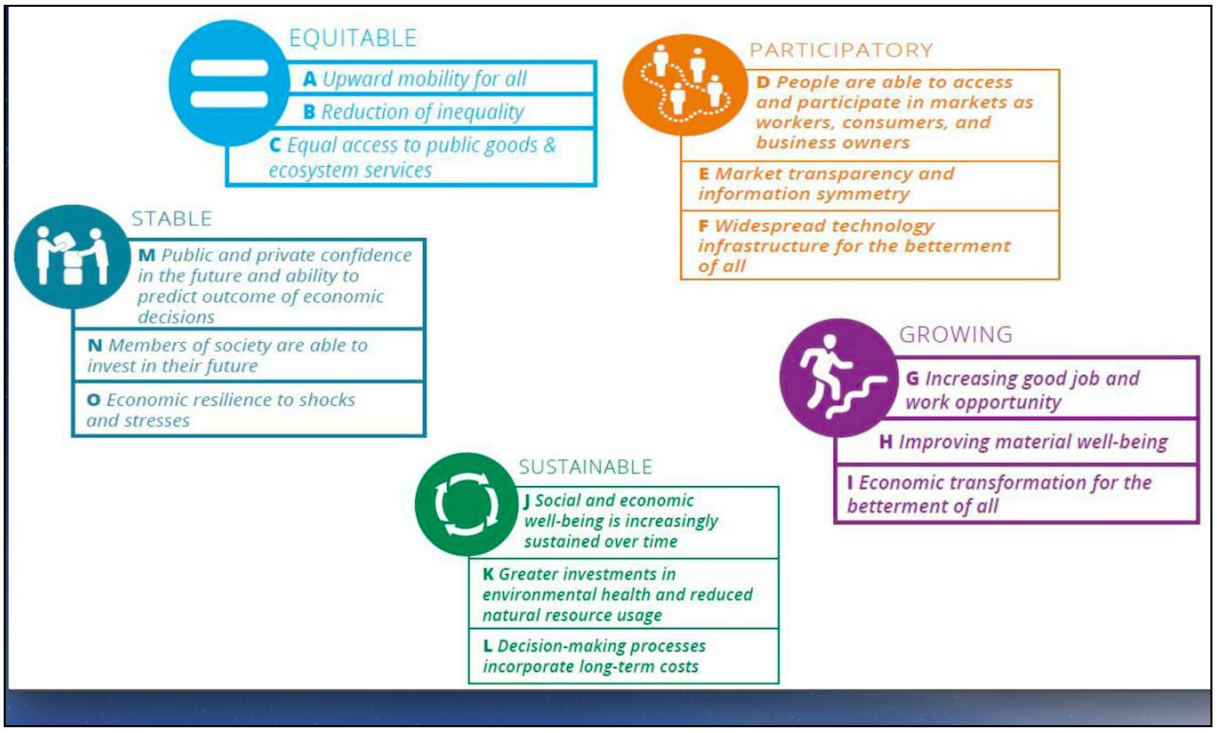

Figure 6: Inclusive Economies Framework (Benner and McGranahan, 2017)

Because of the complexity and multi-dimensionality of the concept of well-being, it is important to try to consider all of the dynamics and relationships that exist within these domains when attempting to understand the concept and develop a framework for assessment of well-being. The relationships between these dimensions are determined and differ according to societies and places and they are all important for understanding the quality of life of a certain place (El Din et al., 2013).

In the next section some of the key components of well-being that emerge in the literature and their potential impact and influence on well-being are outlined.

9. Key determinants of well-being

9.1. Access to basic services

Access to basic services such as clean water, energy and sanitation was considered by much of the literature reviewed as being the most important factors for determining urban quality of life and this ultimately is considered to impact human well-being. Access to basic services, have a specific spatial footprint which is extensively reported on at a detail spatial scale and has a major impact on a range of aspects of human life. Fundamentally it speaks to health

outcomes as it impacts diseases levels and living amenity. Financing basic urban services, especially trunk water supply and sanitation, is a formidable challenge facing the post-apartheid government and vital for sustainable urban development. As urban populations have continued to expand, so has the demand for these basic services continued to outpace local government's ability to provide these services (Goebel, 2007). The evidence for unequal provision of these services that impact on human well-being essentially has a clear spatial pattern and can be used to compare different areas of a city with respect to progress in service delivery and to potentially compare to other components of well-being. These services include access to clean drinking water and dignified sanitation, access to energy, and to access waste removal services.

9.2. Access to social facilities

Having access to a range of social services and facilities is beneficial to the well-being of people. The main factors contributing to quality of life and well-being in terms of access to services and facilities include improvements in health care, medical science and education. Once again the provision of these services is seen to have a clear spatial manifestation which can be mapped and correlated to other well-being components. While such facilities do not necessarily need to be provided in all residential areas they should be located within certain minimum distances of where people live and at a minimum threshold per 1000 population. Due to the critical nature of such services in development and in redressing past imbalances in service provision, in South Africa minimum provision threshold standards and access distances are set for these services in urban and rural areas (Green and Argue 2012) and several projects have been conducted in four of the largest metros to test both the accessibility and sufficiency of these services (Green et al 2012,2014, 2016). Data from these studies could potentially be used to compare to well-being or to a Multi-Deprivation Index, SAMPI or HDI. According to Goebel (2007), some of the barriers that people may encounter in gaining access to services and facilities may include distance to transport facilities and to the provision of services themselves .In South Africa experience has shown that a larger factor is the capacity of urban facilities as well as the quality of services (school and health) For disabled people this problem is exacerbated where not all transport systems are accessible to disabled people. A lack of information about the location of services or even lack of the correct documentation such as identity documents can also act as a (implicit) barrier for people to access certain services and facilities. In general, the spatial distribution of services within cities and how easily these services can be accessed has an influence on the quality of life and well-being of places. Levels of well-being are influenced by the availability of services and the distances people have to travel to gain access to services and facilities. As a result, certain neighbourhoods in the city will have a better quality of life compared to others due to provision of facilities within their local area or as a result of good connectivity of the area to well-resourced parts of the city. Thus in terms of service provision

it in not only important to consider facilities in or near to places of residence, but how well the residential areas is connected or located relative to other parts of the city

9.3. Education

Access to formal education is viewed by many as the key to making progress in life and improving well-being; however, its effect on personal well-being is complex. Being able to read and write gives people access to a greater range of opportunities and provides a range of options and choices that can lead to better jobs, higher wages and improved standards of living. Education increases people's self-esteem and allows them greater control over their future. In some communities, education is difficult to access owing to distances, quality of education services, the quantity of provision and affordability (poverty being one the major reasons why children do not attend school or dropout early to support their families).

In wealthy countries, such as Australia, New Zealand and the United States, education is seen as so valuable that it is made compulsory, free and universal. There is evidence in the literature that points to the positive correlation between educational attainment and socio-economic status (Botha, 2010). By and large, those with higher levels of education have higher well-being. There is some evidence that continued learning throughout adult life has positive impacts on well-being. People who keep learning have: greater satisfaction and optimism; report higher well-being; show a greater ability to cope with stress; and report more feelings of self-esteem, hope and purpose. Setting targets and reaching them can create positive feelings of achievement. Learning programmes also often increase connections with other people, and so doing helping to build and strengthen social relationships. However, the Stiglitz Committee expresses regret that little research is focused on studying the effect of education on quality of life (Stiglitz et al., 2009: 46).

Rates of schooling and literacy (the ability to read and write) are increasing around the world. In Sub-Saharan Africa, for example, the enrolment rates of children in primary school rose from 58 per cent in 1999 to 76 per cent in 2010 (United Nations, 2012). This means that 43 million more children received a primary education in the region by 2010.

In South Africa in particular, education is seen as a basic right and there are attempts to provide it at little or no cost to the poor, but the education system here does not compare favourably with education systems in other African countries, or in similar developing economies in terms of (1) its cost; and, (2) its performance (Centre for Education and Policy Development (CEPD), 2013). There are a multitude of well-publicised problems experienced in the South African education system – children are leaving school without the ability to read and write. Learners from families affected by poverty and hunger and who have parents with little or no education themselves are impacted heavily when it comes to their performance/motivation in school. In addition to this, there is a shortage of teachers, as well as underqualified teachers and poor teacher performance (CEPD, 2013). This is a clear

determinant of poor education levels and is a serious concern for the education system in South Africa. While several accessibility based studies have been undertaken by CSIR to test both the accessibility and capacity of schools in the major metropolitan area, there are several factors that cannot yet be easily evaluated at a spatial level due to how data is collected, reported or made available. These include quality of teachers working at schools in certain areas, literacy and numeracy levels for different critical age group levels, matric pass rates and especially the origin of student at specific schools

9.4. Shelter

Access to appropriate and affordable shelter is fundamental to meeting basic human needs. Not only must we look to the provision of adequate and affordable shelter the location of the shelter relative to employment opportunities and other facilities is a critical component to consider, especially as it relates to major areas of employment. Thus we need to look to the location within the city spaces of government funded housing, affordable rental stock, location of informal settlements and backyard rental as they related to access to employment and other income generating opportunities as well as provision of, or access to social facilities for this housing intended to shelter the poor in the community. The Constitution of the Republic of South Africa outlines the commitment to provide housing for the poor and, as a result, the provision of low cost-housing has been one of the key strategies for government to address historical inequalities, rapid urbanisation and poor municipal service provision in the country. "The extreme social inequalities and urban fragmentation mean that municipalities are struggling to deliver basic housing and services to the massive numbers of people marginalized by the apartheid past" (Goebel, 2007). However, despite there being significant progress in this regard, backlogs remain. Goebel (2007) argues that RDP housing developments in South Africa have many problems and continue to follow the social engineering of apartheid that has resulted in many of these developments being located in urban peripheries, which are often far from jobs and services. In addition to this, the infrastructure and the houses provided are frequently of poor quality – rapidly deteriorating and requiring maintenance – all of which contribute negatively to well-being, especially if a large proportion of income has to go into improving living conditions. Informal structures and backyard dwellings or rooms for rent should also be available options for housing provision provided that these structures have access to adequate clean water, dignified sanitation, electricity and waste disposal.

In the Eurofound study (2015), the strongest housing-related predictor of life satisfaction was housing insecurity. Albrecht and Ramasubramanian (2004) point to homeownership as an indicator of economic and financial stability. The authors also state that home ownership has a positive correlation with overall well-being as it creates opportunities for individuals to build social support networks through participation in a variety of community development

activities. In South Africa many living in low income rental do not have signed lease agreements nether do those in informal settlements have any form of tenure.

With regard to the quality of shelter, measures of material deprivation (such as an inability to keep the house sufficiently warm/ cool, in a decent state of repair or replacing worn out furniture) were associated with lower subjective well-being compared to the well-being of those who were able to afford, or not need, these things. The availability of inside water and sanitation also makes it easier to avoid the spread of diseases such as tuberculosis, malaria and other contagious diseases.

Living conditions, such as overcrowding has an influence on health and may be caused by factors such as high housing costs, economic constraints and accessibility factors are also considered as a factor that affects well-being. From a public health perspective, overcrowding facilitates the spread of infectious diseases and creates unhealthy and untenable living conditions. Housing-related studies have indicated that and occupancy rate of higher than two people per habitable room has a negative impact on inhabitants of low cost dwellings. (Mark Napier personal communication. March 2018).

9.5. Health

Health is a major influence on human lifespan and quality of life. The World Health Organisation (WHO, 2001) defines health as a "state of mental, physical and social well-being which is not limited to a lack of infections and weakness, and is not static but a dynamically changing process". The Stiglitz Report (2009) places great emphasis on the effect of health on objective and subjective well-being; in fact, out of the eight dimensions, it considers health as one of the most important determining factors. Self-assessed health is often found to be one of the strongest predictors of life satisfaction. For example, it is the second strongest predictor in Eurofound, and the fourth in OECD. The provision of and access to good quality health services which is accessible to the local community is a key contributor to well-being, together with clean water and dignified sanitation. Thus these three components and where they are provided in space have a direct influence on human well-being.

Good quality housing and housing services are also found to contribute significantly to the health and well-being of communities. Quality of housing is important to health and people need homes which are safe, warm and dry and free from infestation to ensure their well-being. This is one of the prerequisites for health set out by the WHO (2001). Poor housing can have a negative impact on a wider range of physical and mental health problems (Waters, 2001). The table below outlines some of the potential impacts of poor housing on health.

Table 2: Potential impacts of poor housing on health (Waters, 2001)

HOUSING CONDITION	POTENTIAL CONSEQUENCE
Physical Health	
Overcrowding	Increased risk of infectious/respiratory disease. Reduced stature.
Damp and Mould	Respiratory problems, Asthma, rhinitis, alveoli, Eczema.
Indoor pollutants and infestations	Asthma.
Cold	Diminished resistance to respiratory infection. Hypothermia. Bronchospasm. Ischemic heart disease, myocardial infarction and strokes.
Homelessness (rooflessness)	Problems resulting from facing the elements without protection. Risk of assault.
Homelessness (temporary accommodation)	Problems resulting from overcrowding, noise, inadequate cooking and washing facilities.
Mental Health	
Relatively poor quality housing in each tenure	Resident's mental well-being reduced.
'Difficult to let' housing	Poorer emotional well-being than people in better areas.
Damp	Depression in women.
Overcrowding	Emotional problems, bed wetting, development delay, poorer educational attainment and mental adjustment in children. Social tension, irritability, impairment of social relations.
Flatted accommodation	Increased GP consultation by women for emotional symptoms. Social isolation and psychiatric disturbance among women.

Access to healthcare is an important consideration, as discussed in section 4.2 since health inequalities roughly mirror patterns of economic deprivation (Lucas, 2011). In the study conducted by Lucas (2011), it was revealed that people who live in peripheral areas in urban areas often find themselves travelling extensive distances to access health care facilities, and experience challenges with using public transport systems. Health disadvantage is exacerbated in socially and economically disadvantaged settings as according to Lucas (2011), people living in particular localities may be prone to particular diseases, if the causes of that disease are located in the environments in which they live. Although disease and illness may be caused by a virus or toxic substance, it may be social institutions and practices which actually create the circumstances in which people come into contact with these disease inducing agents. Overcrowded environments exacerbated by poor living conditions are often associated with rapid spread of infectious diseases such as tuberculosis. On the other hand places that have certain environmental characteristics, such as the availability of healthy foods, health-affirming services, community norms and so on, which influence health behaviour have a positive impact on health.

According to Lucas (2011) and in developing countries especially, lack of access to affordable and healthy food also contributes to the health inequalities experienced in urban areas. Many people who live in the urban periphery experience difficulties when it comes to just putting any food let alone healthy food on the table; and income and access to food shopping facilities are very important in the reduction of health inequalities.

9.6. Economic security

One of the strongest and most consistent findings in the well-being literature is that being unemployed has a negative impact on subjective well-being (regardless of how subjective well-being is measured) as well as mental health. The decline in well-being is beyond what would be expected from a decline in income from not having a job. Access to employment is seen as paramount, especially within the UK social exclusion agenda, because this is seen as the main way in which people can lift themselves out of poverty (Lucas, 2011). It also appears that unemployment affects well-being by diminishing our sense of purpose and by reducing our social connections. Furthermore, the negative effects of unemployment are lasting. Unlike many life changes, we do not adapt to becoming unemployed, and indeed a period of unemployment reduces well-being, even after a job has been found (Albrecht and Ramasubramanian, 2004). This confirms that in measuring well-being, an assessment of the levels of access to work opportunities and the levels of employment are important. Unemployment in South Africa is at an all-time high of over t27% and significantly we see a spatial pattern that emerges when levels of employment are mapped within a city and this contributes significantly to the perception (and reality) of spatial patterns of income inequality, poverty and well-being in our cities.

Having a very low income or experiencing economic deprivation – which is closely related to having a job – is also associated with low well-being. Based on analyses of the European Quality of Life Survey, Eurofound reported that someone who suffers severe material deprivation (not being able to afford a range of expenses such as buying new clothes, having guests over for a drink or meal, or a week's annual holiday) scores 2.1 points lower on life satisfaction than someone who can afford all these expenses (holding all other variables constant). Their material deprivation index was the single strongest predictor of both life satisfaction and happiness in the survey. Beyond a certain point, however, it appears that increasing income plays a limited role in increasing well-being. For example, Origins suggests that, on average, doubling one's income will only increase life satisfaction by 0.2 on a 0–10 scale, and that the effect is even weaker when talking about doubling average income owing to the relative income effect (Eurofound, 2015). In South Africa too, employment is rated as one of the key factors people feel will improve their lives (Møller et al. 2017) and NIDS and the lack of employment for a large portion of the population is seen as a key contributor of poverty, income inequality and ultimately a lack of well-being.

The literature also points to job quality as being a contributing factor to subjective well-being; although, almost any job is better than no job. Nonetheless, job quality has a very strong effect on subjective well-being. Jeffrey et al. (2014) highlights the following factors related to job quality as most important: work-life balance, fair pay, job security, clarity, management systems, work environment, sense of purpose, sense of progress, sense of control, and relationships. Work-life balance consistently emerges as one of the most important factors provided that one has a job or an alternative form of income. Origins, based on analysis of the European Social Survey finds work-life balance to be the most important job-related indicator predicting life satisfaction and has reported it to be one of the top five predictors of life satisfaction overall (Eurofound, 2015). Work-life balance is of course linked to working hours, and very long working hours (over about 40 to 50 hours a week) have been found to have a detrimental effect on individual well-being and mental health. Temporary work contracts, particularly when they are for less than 12 months, are also associated with lower levels of well-being if they are only accepted because a permanent work contract is not available (Eurofound, 2015). This aspect of well-being may, however, be more relevant in societies with higher education levels or expectations of having quality employment and may not be as relevant for a developing country such as South Africa where jobs are very scarce and unemployment levels currently stand at almost 27 per cent (StatsSA, 2016) and where the majority of people live in low-income families.

9.7. Mobility and transport access

Several research studies show that low-income workers living in and around central cities are unable to access the service sector jobs that are available in suburban communities or vice versa due to lack of affordable transport. Factors such as vehicle ownership and access to public transportation thus have a significant impact on individual well-being. Access to affordable transport where the household does not need to spend significant amount of time or money on being able to access employment, other income earning opportunities or facilities such as health and education can make a positive contribution to well-being while where low income households needs to spend more than 10% of their income on transport costs and commute for more than 3 hours a day this has significant negative impact on well-being. This is specifically important for people living on grants

9.8. Access to Social safety net

Access to social support systems is acknowledged as a key factor in ensuring the poorest in society have access to at least a minimum income to provide for basic needs. To this end a range of welfare systems world-wide provide different forms of income support. The proportion of the population living on social grants is quite significant in South Africa. Currently the spatial distribution of grant recipients cannot be spatialized directly due to lack of data input but efforts are currently being made to find ways to overcome this limitation. Individuals who receive income support tend to be more vulnerable than those who do not

and the incomes of such individuals tends to typically be stretched to the point where any sudden changes in their social and physical environments can potential have a negative impact on their well-being. As indicated above the high cost of transport from peripheral areas in previously segregated townships can have a very negative impact on a family if needing to travel a far distance to seek employment. It is also noted that the addition of a family member or the death of a household member who is receiving a grant (NIDS) has a significant impact on whether a household falls into poverty.

9.9. Safety and security

Crime rates in a locality impacts the well-being of people who live in that area, though this effect is only in relation to violent crime, not non-violent crime. According to Berki (2015) the well-being dimension of insecurity is inseparable from criminal issues. A core element of the Stiglitz Report's insecurity dimension is people's sense of fear. It is useful to note that the amount of people whose lives and well-being are influenced by fear is many times more than those that are actually affected by crime (Stiglitz et al., 2009: 53). This means that societies with a higher sense of fear do not necessarily have the highest crime rates and that out of all social groups those who fear the most are the elderly and the rich, whose well-being is implicitly reduced by fear. The fear of crime is a regular indicator of subjective well-being, with studies often assessing respondents' fears of walking alone at night. Other studies, including the OECD analysis (OECD, 2017), have shown a negative effect, albeit smaller, of actual experience of crime, for example having money or property stolen. These patterns show the need to measure the sense of personal security and insecurity and ultimately uncover its spatiality.

According to the SACN (2017), almost half of the murders that occur in South Africa happen in urban areas. In addition to this, approximately two-thirds of aggravated robberies, as well as 75 per cent of hijackings and vehicle theft, occur in cities. The report states that four South African cities are rated to be among the top in the world when it comes to violent crimes. Violence and crime are usually not evenly distributed across neighbourhoods in these areas and it is usually in the poor, urban neighbourhoods that this violence is concentrated. The literature also points to the associations between increases in violence and increasing concentrations of poverty and inequality (Wolf, 2013); however, the explanation for this is still unclear. Social control and the social organisation of neighbourhoods have recently been reported as important in understanding the variations of violence and crime in neighbourhoods. The factors that contribute to this may include the individual sense of belonging, social cohesion among community members, the presence of role models and the control and supervision of children and young adolescents within the community. According to Wolf (2013), "the structural barriers of the neighbourhood can impede the development of social organisation within neighbourhoods, and, in turn, this may increase the risk for violence and crime."

Further to this authors, such as Curry (2008), have reported that children who live in poor urban areas are often exposed to a variety of crimes and violence at early ages. According to Curry, this exposure threatens healthy development and is related to a host of short- and long-term developmental problems. These children tend to have more academic problems, anxiety and post-traumatic stress disorders, and depression as well as more externalising disorders such as violence itself or aggression.

9.10. Environmental quality

The state of the environment is not only a high priority in sustainability (which is the central element of the Stiglitz Report) but it is also a highly important factor that affects people's higher levels of quality of life or well-being, subject to their basic needs already being met. It has a direct influence on the well-being of people and particularly on human health (e.g. through water quality and air pollution, noise, the contamination of soils). It also has an indirect influence through factors such as climate change, increasingly common natural disasters, and decreasing biodiversity (Brown et al, undated; Stiglitz, 2009). It has also been pointed out that the effects of the natural environment on social well-being is probably the hardest aspect to capture using objective indicators and, according to the Stiglitz Report, studies should rather measure people's satisfaction with the state of the environment and their personal feelings related to this because any change to the environment tends to affect each social group in different ways and to a different degree (Stiglitz et al., 2009).

According to Goebel (2007), areas of low-cost housing in South Africa tend to experience some serious related environmental impacts such as the contamination of groundwater. This is usually more prominent in informal settlements where there are no proper sanitation facilities. Such conditions and environmental problems that arise as a result tend to be a major cause of diseases and death for people living in those areas. The author also makes reference to concerns regarding increases in vehicular traffic that lead to increased greenhouse gases arising from building new townships on city peripheries. Goebel (2007) does, however, mention that it is not so much the urban poor that place pressure on the environment but that rather the more affluent a settlement becomes, the more environmental burdens tend to become more delayed, diffused and indirect. As an example, South African cities lose more municipal water through decayed urban infrastructure than the poor can consume through the 25 litres/person/day ''life line'', and the suburban elite consumes approximately 50% of South Africa's domestic water usage. It is thus critical that reducing the environmental impact of cities does not become defined primarily as a task focused on low-income areas and people (Goebel, 2007).

The provision of urban green spaces in urban areas is an important contributor to the well-being of people. There is evidence in the literature (Ye et al., 2018) that points to strong correlations between well-being and green environments. Urban green spaces have been

noted to have environmental, ecological, recreational, psychological and economic benefits and, as such, they have been regarded as an essential public service. People who live in urban areas that are greener have been reported to show fewer signs of anxiety and depression (Ye et al., 2018).

There are also numerous behaviours that are known to be associated with improved well-being; physical activity being one for which there is much evidence in the literature. As well as being associated with higher well-being, physical activity, as with the provision of green spaces, has also been found to reduce depression and anxiety. As such, the provision of green space and the protection of natural landscapes are important and is one way that local actors can increase opportunities for physical activity. It is also important that these spaces are designed in such a way that they discourage any criminal or violent behaviour. The challenge with urban planning is how to fit these spaces into already congested cityscapes and make sure that there is equitable access for all people to these spaces so that everyone can benefit (Wolch et al., 2014).

9.11. Social networks

The well-being of people is intricately tied to the social health of their communities and their interaction with the people who they live amongst. These connections affect people and their quality of life in various ways and include feelings of appreciation within a community, feelings of security within the community or better chances to find employment. According to Hallowell and Putnam (2005), there is evidence that confirms that social capital is strongly linked to subjective well-being in several different forms. Marriage and family, ties to friends and neighbours, workplace ties, civic engagement (both individually and collectively), trustworthiness and trust all appear to be independently and robustly related to happiness and life satisfaction, both directly and through their impact on health. Despite some of the positive benefits of social capital, it can, according to Stiglitz (2009), also lead to negative externalities such as higher degrees of criminality should a person associate themselves with certain groups.

9.12. Governance

Political voice and social participation mean the ability to participate as citizens, being part of policy-making, the free expression of ideas, and the freedom of speech. It is also a substantial part of one's quality of life. Several studies have highlighted the importance of the quality of government to subjective well-being. For example, the World Happiness Report includes perceptions of corruption in its main regression explaining variation in well-being across countries. The World Bank's Governance Matters Indicators are often used in these analysis and both voice and accountability and the quality of government have been identified as important. These tools help in improving common policy, ensuring transparency in state and municipal institutions, contribute to articulating the most important human

needs and value judgements, and focus attention on the most deprived groups. They may simultaneously reduce the possibility of conflicts and possibly strengthen the consensus-building skills of individuals. Further factors affecting participation include good governance and a suitable legal environment that together can contribute to forming a favourable climate for investors, an efficiently functioning market, economic growth, job creation, and the creation of material wealth (Stiglitz et al., 2009: 50).

9.13. Commonalities and group specific priorities and perspectives of well-being

The majority of the literature on well-being focuses broadly on the well-being of citizens in general. However, how people experience well-being and life satisfaction or even the attainment of happiness depends largely on who they are, where they live, who their neighbours are, their life stage, age, income, and level of inequality, the duration they have lived in the area, the current quality of life and so forth. In this project the focus is mostly on urban dwellers and urban spaces but, even within this group, there are differences in the emphasis on different components or determinants of well-being depending on life circumstances.

In developing policy or other interventions, it is critical to not only address issues holistically but also to consider the specific needs of individuals or groups of people based on their current reality. This may include some or all of the following: the current family status and living level or deprivation of households, experience of the quality of the space (what is happening in my space (physical) and can it give me some of what I need?), the level of community functioning within the space, the quality of the connections (access) of the place to other parts of the city (can I easily get more of what I need though easy connection to elsewhere?) and finally does the broader environment (e.g. governance) support or enhance the well-being and liveability/inclusivity of the city. Simply put – does where I stay meet my current requirements and needs if not all my wants? The aspect of 'wants' is more difficult to establish and to satisfy than 'needs' as it often changes over time and is strongly influenced by perceptions of inequality and sometimes unrealistic expectations. Thus, evaluating well-being may cover the same components for all people but when intervening to improve well-being for specific groups this needs to be tailored for the specific social groups and/or for specific spatial locations.

In looking at target groups or a specific area, we need to consider not only the characteristics of the place but the people that live in that space. The characteristics of the people in the space must be known to answer the question of 'well-being for whom'? For instance, working couples with children have different priorities from elderly retired people, whose needs in turn differ from the urban poor, new migrants, and the youth. Planning

research and well-being frameworks need to consider the key needs of all people, especially the most vulnerable who cannot 'buy' the rights or freedoms of the city.

This section highlights some determinants that are of special relevance for specific groups.

Women

The well-being of women has seen huge improvements in the last century; however, there is still much to be done to promote gender equality. Many women in many parts of the world are still denied their human rights. In addition to this, they are often subject to oppression and violence, tend to suffer more from extreme poverty, especially in many parts of Africa, and they often have inadequate access to education. As such, in examining the well-being of women, focus is often placed on indicators such as women's educational attainments, their average earnings and their median life expectancy. In America, for example, a study looked specifically at which metropolitan areas were the best for women. In addition this study also looked at how women's ethnicity, race and marital status factored into their overall well-being. The study revealed that a significantly higher proportion of single women tended to earn higher salaries in certain metropolitan areas, that African American women had shorter life expectancies and faced some specific health-related challenges, such as HIV, whereas women of Latino descent lagged behind in terms of educational attainment (Gary, 2012). There is limited empirical data to support such generalisation in South Africa, although the issues of gender equality or rather inequality is still known to be a critical area of concern

The youth

According to StatsSA mid-year population estimates (StatsSA, 2016), 18.5% of the population in South Africa is between the ages 10–19 and 24% are aged 15–24. This makes up almost 32 per cent of our cities' population signalling that this is a significant group to consider. This means that the needs of this group must be taken into account in considering and developing policy responses to well-being. The literature shows that provision and access to education and skills development are seen by this group as critical determinants to achieving employment and economic participation in future and that this is ultimately expected to contribute to better well-being (Møller, 2016) and should contribute to more inclusive development. It is also noted that those youth that are 'information technology connected' can be presumed to have expectations of a higher standard of living than their parents, and this may be especially so for rural youth who move to urban areas.

Children

Despite children living in urban areas often being viewed as better off in comparison to their rural counterparts, many of them live in informal settlements and, as a result, are often exposed to adverse environmental conditions that impact negatively on their well-being. Inadequate sanitation, the contamination of water and a lack of solid waste removal are often the leading causes of death in children who live in cities. In addition to this, the World

Health Organisation (2010) makes reference to diseases such as pneumonia and diarrhoea being common in urban areas and often being a result of poor living conditions such as overcrowding, poor air quality, as well as poor access to healthcare facilities. Literature has also highlighted the importance of a child's wellbeing in predicting their well-being in adult life and pointed to psychological and behavioural problems that may arise in children as a result of being exposed to exploitation and crime at the hands of adults and older children in urban areas (WHO, 2004).

Children living in single parent households also form part of society's vulnerable populations. According to Albrecht and Ramasubramanian (2004), this living situation often imposes economic hardships for the single parents heading these households. In addition to this, children living in poor households are disadvantaged because their educational, nutritional and emotional needs are often adversely affected.

Determinants that affect child well-being include the reduction in infant and child mortality though improved access to basic health services. It is further noted that some of the factors that limit the advancement of young children include malnutrition and stunted growth, which in some countries is exacerbated by conflict and unequal education for girls. In South Africa, safety at school and on the way to school, with children being subject to issues such as rape, is likely to have an impact on education progress. Anecdotally, the lack of functioning toilets at school and the unaffordability of sanitary towels have an impact on the attendance of girls at schools in some areas.

In the Children's Worlds 2013–2014 survey conducted by the International Survey of Children's Well-being (ISCWeb, 2017), which took place in Algeria, Ethiopia and the Western Cape Province of South Africa, the children were asked to evaluate different domains impacting on their well-being. Children on the whole expressed confidence in the future and most generally viewed home and family life as positive. The report exposed some of the key disadvantages that African children face early in life and the resources they lack compared to those in developed countries. These included lack of material goods such as cell phones or home computer, their own room, lack of books or no family car. This was, however, in comparison to children in Norway that is one of the countries with the highest GDP and well-being measures internationally. African children also appear to have less free time as they are required to look after siblings and help with household chores after school. Other issues considered specifically relevant to children's well-being include feeling safe at home, having quiet places to study and places in which to feel safe and play, and also the quality of dwellings. Not noted in the study but known as key factors to education success are hunger, quality of teaching, and electricity at home to support education out comes.

Studies in the USA have specifically shown the positive impact of the introduction of Early Childhood Development (ECD) and school readiness programmes (for children less than 5

years old) in specific deprived areas as leading to major improvement in a number of well-being indicators later in life (Atinc & Gustafsson-Wright, 2013).

The Elderly

As is the case for children, older people in cities are also considered to be one of the vulnerable population groups in urban areas. They are often seen as invisible or rather forgotten among many planning related priorities and a lack of consideration for them is often seen in transport systems that are inadequate in catering for their needs. They also have needs that related to care facilities, hobbies, specialist health care, meal delivery, old age pensions, age-appropriate recreation and single level shelter amongst others.

Recent urban arrivals

According to the World Health Organisation (2010), migration (which is often referred to as the movement of people from rural to urban areas or from poor to richer areas in search of better social and economic prospects) has an influence on the overall measures of well-being in cities. South Africa in particular has seen an exponential increase in migration since the end of Apartheid. Migrants' experience of improvements in their well-being varies from individual to individual and is usually determined by factors such as their demographic and socio-economic profile, whether they have legal status in their location of choice, their education levels, whether they have been granted equitable access to opportunities and services, and whether they have social support networks. In addition to this, their well-being is also dependent on their perceptions of whether the living conditions of their location of choice are better than those of where they come from (International Organisation for Migration, 2013).

Migrants from rural areas, as well as foreign migrants appear to be some of the most marginalised and vulnerable of urban groups. Most are economic migrants in search of livelihood opportunities; whether in the form of formal employment or a chance to set up trade in a bigger market. They also need basic shelter. With most migrants to South Africa cities being single males the requirements (for well-being) is likely to initially relate to some type of basic rental shelter and means of transport as well as securing employment and earning an income. It has been noted by (Cross et al. 2012) those migrants that have access to social networks have been found to be more successful in gaining a foothold in the city with respect to both housing and income. Once migrant's families join them in the city or they marry and form a family, the specific determinants that contribute to perceived well-being may begin to shift as needs change and more complex to include aspects such as access to better health care, better and/or more permanent housing, education and safety concerns.

Special needs groups

Many other projects target the special requirements of people with physical or mental impairment. The components of well-being for this group are essentially the same as for others as we all want to be accepted and included; however, adaptations are required with respect to street and sidewalk design and material, audible crossing signals, adapted housing, specialised schools, Braille signage, et cetera. What is likely to be different is what policy interventions are put in place to support this group in achieving the 'freedoms' of the city.

9.14. Other factors

Albrecht and Ramasubramanian (2004) point to the introduction of race and ethnicity in spatial analyses that shows that people of colour tend to be worse off than their white counterparts. In addition to this, there are other factors such as climate change and variability, personal debt (unmanageable debt, typically credit card debt and consumer loans, are associated with lower well-being, depression and anxiety), sleep problems (there is significant evidence that a lack of sleep leads to both health problems and lower well-being and optimism), and informal caretakers (e.g. people who have informal care duties, particularly caring for elderly or disabled people, have significantly lower well-being).

10. Towards a common ground in understanding spatial determinants of well-being

An outline of the literature on well-being and quality of life, including a range of indices that provide a greater understanding of the different complex domains of well-being and covering a broad range of material, legal, political, social and environmental conditions, has been given in this report. The determinants of well-being in urban areas encompass basic services, the availability and quality of these services and social facilities, the economic and social environment, as well as including aspects of the built and natural environments and urban governance issues. From this, an understanding of how the characteristics of different spaces have an influence or impact on people's lives and result in spatial differences in well-being across the landscape was created. This section provides a summary of those components that are considered to be specifically spatial in nature or where the influences have a spatial footprint.

Given the past imbalances of South Africa, and the very obvious fact that former townships and informal settlements mostly continue to have a lower level of well-being post 1994, a detailed spatial understanding of the urban landscapes of well-being can be used to inform policy action. This section highlights the determinants of well-being and specifically those that manifest differently in space and may result in spatial differences in well-being in the different parts of a city.

It is clear from the literature that achieving well-being in its fullest sense encompasses socio-economic and environmental components that are varied in nature and encompass a holistic range of material, legal, political, social and environmental conditions. The spatial levels of these components are governed and/or influenced at different spatial scales. The health and peace of the planet is strongly dependent on the international context and collective action of the international community while those that more directly influence the **opportunity** of achievement of the well-being of people stem from closer to home. These include the economic, legal and political states of a nation which are strong determinants of personal rights, personal freedom and choice, tolerance, community safety net and access to advanced education. The economy, policies and budget of the country in which you live directly influence some of the **foundations of well-being** since these impact on education policy and funding (the access to basic knowledge component), access to information, health and wellness (health policy and funding) and to some extent environmental quality. These national level instruments can also be a major influence in terms of certain basic need components such as nutrition and basic medical care, water quality, shelter (specifically location choice with respect to housing), as well as personal safety. On the other hand, many aspects of environmental quality and **basic human needs** such as access to basic medical care, clean water and sanitation, affordable shelter options and personal safely are highly dependent on location choices made in terms of where implementation occurs – that is in which specific areas of a city. Spatial planning and the location of infrastructure investment are likely to be critical spatial determinants that directly influence the quality of the built environment; an aspect that is critical to the well-being of city residents and especially important for marginalised groups or individuals.

What is clear from the literature is that the absence of certain basics such as food, clean water, clean air, sanitation, affordable shelter, basic education, energy and security in the immediate living environment are clearly considered to be barriers to well-being. If these basic needs are met and all residents are able to access education, basic health care, livelihood options and communication within a reasonable time or cost, then it is possible to start to build the foundations of well-being within the space in which people live. While such barriers and key enablers are generally well understood, what requires much more consideration in poor and marginalised areas is to understand what more is required once a basic level of well-being is provided such that residents can truly achieve a higher level of well-being and for cities to reach a desired level of transformation and inclusivity.

Given the rights granted by the South African constitution, as well as legal frameworks at a national level, most of the key components of the legal/constitutional domain are already in place to support well-being, and this study will not consider these aspects further. We will look more to those aspects that directly influence what happens in local spaces and where it happens as being the focus of this project on spatial determinants.

Given that South Africa is still plagued by inequalities and that large numbers of the population living in its urban areas are still located either in traditional townships in peripheral areas or in informal settlements on the outskirts of cities (Lucas, 2011), often struggling to gain access to many of life's '*freedoms*', the issue of **access** to a range of services or support structures becomes key in determining the well-being of those living in cities, especially in the absence of economic growth.

Thus, while population characteristics including race, age and gender may strongly correlate with levels of well-being in post-apartheid South Africa, this project rather seeks to explore the key determinants of well-being that relate to health, education and transport, housing choice, access to livelihood or economic opportunities, safety and security and environmental quality and its impact on levels of well-being. According to Goebel (2007): "In terms of livelihoods, proximity to economic opportunities is a major priority for poorer people, as are job creation, training opportunities and education. Improvements in these aspects of social well-being can contribute to the development of an ecologically healthy city, such as in linking with densification strategies, alternative energy sources and ecologically healthier building materials and practices."

It is clearly evident from the literature that the factors that contribute to an individual's well-being are not mysterious but hinge strongly on access to services, education, health, safety, and employment. The absence of these components in any space can clearly be considered barriers or 'unfreedoms' to well-being.

Planning perspectives reflected in the well-being literature commonly appear to adopt a fairly static, top-down approach to the way well-being is perceived and addressed. One of the key challenges is that the literature does not appear to devote substantial space to the issues around how well-being changes over time, across the lifetime trajectory of individual citizens and their households, or to identifying the circumstances or vehicles of positive change; that is – perhaps most pertinently – to what extent well-being can be bought by the citizens themselves to change their lives for the better? Or, in what ways are people in cities subject to losing ground?

A critical issue that will need to be addressed in future is how to measure spatial access to well-being in a context of movement and residential settlement by especially poor citizens. A critical challenge and a question not well addressed in the literature to date are the roles of agency and mobility in well-being, as it is viewed from the bottom up, from a standpoint of continuous change, and in a spatial-city context.

The main questions related to this are:

1) To what extent poor people can successfully move through the city to improve their own well-being, through their own efforts, and by realizing their own plans? Can poor people use the city to reach well-being? That is, can the poor move between city residential locations so as to maximize their well-being outcomes? And how does the urban environment support them or obstruct them as they try to realize their aspirations?
2) How does the need for spatial access to the city change successively in respect of achieving well-being over the lifetime trajectory of the household or individual? It does not necessarily follow that if a suitable temporary entry foothold can be found, a poor individual can later move on successfully to suitable owned permanent family housing once a household with children is formed.
3) How far are people now settled in poor urban areas able to change their well-being status by successful engagement with local government for real improvements to their locality, in terms of public delivery of housing/serviced sites on well located land, as well as the provision of infrastructure and civic amenities?

Well-being is closely related to the issue of the Right to the City (LeFebvre 1996, Huchzermeyer 2013, David Harvey, 2008) against the reality of exclusion, if these factors are taken as part of the well-being equation. In Görgens and van Donk (2011), Purcell views the Right to the City as being about the right to participation (inhabitants having a direct voice in all decisions relating to urban space in their city) and the right to "*appropriate* urban space" (such that urban space can be fully and completely used by inhabitants in everyday life).

> *The question of what kind of city we want cannot be divorced from that of what kind of social ties, relationship to nature, lifestyles, technologies and aesthetic values we desire. The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. … The freedom to make and remake our cities and ourselves is, I want to argue, one of the most precious yet most neglected of our human rights.* (Harvey, 2011)

Although the Right to the City has an urban focus, the linkages and movements between urban and rural areas must be understood and acknowledged in the development of "socially relevant and spatially just policies" (Görgens and van Donk, 2011).

In South Africa, and in many other developing countries, the major cities often carry a negative reputation for hostility to rural–urban migration. This places a specific focus on the in-migrant poor as a key constituency in regard to urban processes that promote or obstruct the attainment of well-being; although this group currently only makes up a very small minority of the urban population.

Given the reality of continued urbanization, urban concentration and population growth and specifically the greater efficiency/viability of providing services in more densely populated settlements, this perspective raises questions about how far the rural migrant population is being supported to come into the cities to maximize their well-being – including both their present well-being and the plans for future well-being. The project specifically focuses on how much the city-born poor population is able to use the city's amenities to improve their standing. From the rural in-migrant side, the central question is how far the urban environment allows migrants to reach a situation of well-being that meets their aspirations to middle class standing (Bolt, 2015; Collinson, 2001).

In regard to the measurement of well-being across the time space dimension, key issues would appear to include:

- ⇒ *Spatial distribution of housing modalities used by disadvantaged poor citizens* in the major South African cities, with potential consideration of a scoring index for well-being by different types of areas. This may include income measures, housing quality and subjective well-being that will need to be tested via regression analysis and other means such that they can be related to identified determinants of well-being such as selected physical factors which are easily counted. A great deal of work has been done on the distribution of settlement typologies for Gauteng in particular, with the extensive work of GCRO, together with significant GIS-based work from CSIR (Shapurjee et al., 2014) on the comparative distribution of shack areas and backyards (this also locates townships and is partly based on Knowledge Factory and GeoTerraImage commercial data);
- ⇒ *Measures of internal migration flows through cities* by mode of housing and point of entry, which is highly predictive of the onward path through the city, (see SACN 2014 unpublished) and for which national Census data could be used if permission is obtained for using data at the necessary level of granularity;
- ⇒ *Measures of how specific residential areas change over time in respect of well-being,* with changes in neighbourhoods and particularly the outcomes of informal settlement upgrading as a central consideration. In addition the work of Charlton, Rubin and Gardner for SACN (2013) on how RDP subsidy housing units are used and the impact on livelihoods and living levels may be relevant. Likewise, the stepSA Policy Brief 4 (2014) shows in some detail how very poor households in informal settlements are able to shift their circumstances and increase their well-being up to middle class standing, by mobilising resources for self-build housing when provided with secure serviced sites in an upgrading context;
- ⇒ The assessment of the *relative time-and-cost accessibility of different individual settlement areas* in the city, in terms of affordable access to work, to amenities, and to other factors involved in well-being. The CSIR has done significant research in the

accessibility context in respect of urban planning needs (CSIR, 2007). In addition, the Access Envelopes measurement tool produced by StepSA research (StepSA, 2012; Venter & Cross, 2014) – which measures to what extent specific residential localities for poor urban communities have affordable access to work locations that can allow work-seekers to retain a viable wage level – is sensitive to both land use and transport delivery patterns, and may offer a further starting point to be adapted for measuring well-being and testing the impact of these spatial determinants;

⇒ The movement of people using public transport networks and non-motorised transport ('walkability' in cities). For many people in urban areas public transport is critical in allowing them to access goods, services and opportunities. It is, therefore, important to establish how affordable it is and how it meets people's requirements. Four quality of life dimensions that are related to transportation (physical, mental, social and economic well-being) have been identified by Lee and Sener (2016). These are mainly influenced by a transportation system's components of mobility/accessibility, the built environment and vehicle traffic;

⇒ Qualitative and narrative *accounts of aspiration and personal movement strategies, the planning* and of the *actual process of selecting new areas and arranging entry* could also be factors to consider. However, there is currently probably not much hard, storable information available; although many migration studies do cover the issue of destination information as a key enabling factor in migration. For the poor, destination information that allows movement between residential areas depends mainly on social networks, which are often well researched; however, it is not immediately clear how much research is available on this topic for the South African major cities that can be readily related to the spatial determinants of well-being. The Southern Africa Labour and Development Research Unit's (SALDRU) large NIDS qualitative database offers one possible option to be explored but the level of granularity/ scale of the data is a major limitation for sub-city level differentiation. Qualitative information in more depth concerning area identification, relative affordability and the empirical process of gaining entry might be needed to fill in this aspect of the well-being framework.

D. FRAMEWORK DEVELOPMENT

11. Concepts from the literature review used in the formulation of the framework

The widely accepted move away from using only GDP and economic factors to measure human well-being has meant that a range of different domains, components and indicators have been used, in different ways and in different combinations, to develop frameworks for measuring what is generally accepted to be a more holistic understanding of human well-being. In the main, most frameworks measure outcomes, although in some instances a combination of likely input factors are measured in combination with the identifiable outcomes. None of the frameworks were found to be spatially explicit. Nonetheless, what emerge clearly from the literature are certain recurrent and common concepts and components of well-being that can be used to organise and consider well-being components and explore potential spatial relevance.

Many different approaches and measurement frameworks have been developed (their scope and indicators used depend largely on their overall aims) to consider a number of complex composite indexes of or approaches to assessing well-being. The main frameworks considered relevant in this context are:

- ⇒ The New Urban Agenda
- ⇒ The Integrated Urban Development Framework
- ⇒ The Sustainable Development Goals
- ⇒ The OECD Framework for measuring well-being and progress
- ⇒ The Social Progress Index
- ⇒ The Sydney Community Well-being Indicators Framework
- ⇒ Benner and McGranahan Inclusive Economies Framework
- ⇒ The Weighted Index of Social Progress
- ⇒ The Multiple Deprivation Index

Most of the above frameworks measure well-being at a country or possibly a provincial scale and sub-city measurements of such a complex approach is rare. Only the Multi-Deprivation Index has been applied extensively at sub-city scale.

Given the policy context in South Africa as well as the spatial landscape, a rights-based, integrated and multi-dimensional definition of well-being is used as a departure for the approach to measure the well-being and inequality of South African cities. Ways of explaining spatial well-being that may prove useful for monitoring progress with respect to

development and inclusive growth is also considered. Thus, the approach to developing the framework is grounded on the rights as enshrined in the Constitution of the Republic of South Africa, while the understanding of well-being takes into consideration the literature input and specific, related policy documents. As indicated in the project approach, the study aims to develop a holistic framework for assessing and testing the spatial determinants of well-being – both physical and non-physical – at a sub-city scale.

The literature in general tends to focus on the well-being of all citizens and the framework developed will for this project will on urban dwellers and will specifically consider the previously disadvantaged and the most vulnerable who generally experience lower levels of well-being. These include the poor; recent urban arrivals; and the unemployed.

The report will also highlight some of the factors that are of specific relevance to selected sub-groups including the youth, pre-school children, women and the elderly; however, given the scope of the project and existence of specific programs, the project will not address.

12. Limitations and methodological considerations of measuring well-being and spatial indicators

Indicators are a useful tool for communicating on the performance of cities against their competitors as well as in helping establish targeted policy directions. However, according to authors in the literature such as Holloway and Wajzar (2008) and Stoki (2002), this process comes with a number of limitations that may undermine the validity of the indicators used for measuring and monitoring the performance of cities as well as in informing urban policy. These limitations can range from the compatibility and integrity of the data used among different cities, the overstatement of the relationship between outcomes in cities as well as the indicators that have been used, to subjectivity in analysis and drawing conclusions from the data as the level or scale that the measurements was undertaken and the sample size. These and others will be outlined in this section.

According to (Woolcock, 2009) the challenges with using composite indicators is that they are first and foremost proxy measures that are usually used to measure and describe very complex phenomena. As a result, there is the possibility of a tendency of confusing index measures with the phenomena the indicators attempt to describe. In other words, a low rating score on a well-being index may lead to the assumption that the index describes the levels of marginalisation or deprivation of a community while it may only mean one indicator has scored very low while others may be acceptable but unless the individual scores of each component is known this is not useful for policy intervention.

Furthermore as indicated in earlier sections of the report, a many researchers have tended to neglect the psychological or more subjective element of well-being in such studies and

have as a result relied solely on hard data or objective indicators as measures for well-being. This is only half the concept and as such, the measures may be criticised for not providing a whole picture of well-being.

Another key challenge to overcome is the lack of data in differentiating and comparing the sense of well-being within places – neighbourhoods, cities or countries. According to Holloway and Wajzar (2008), the availability and comparability of data limits all city well-being indicator exercises. This in turn often limits the scope, diversity and depth of what can and cannot be measured. Gaps in the data across cities and indicators, the regularity and reliability of both unpublished and published data and the differences in the methodologies used in collecting data are some of the issues that contribute to the challenge. The authors go on to mention that in addition to this issue of data comparability, the large differences in the geographic sizes of the cities within their respective administrative boundaries also poses a challenge as the data they collect may sometimes vary significantly which in turn has an impact on the data results. While some indicators attempt to manage this by reporting per capita or per area, these techniques have their own limitations (Holloway and Wajzar, 2008).

The geographical unit of analysis is another limitation that exists when measuring well-being. Because the levels of well-being are not the same for different locations, using statistics that largely wipe out these differences makes such measures of well-being questionable in terms of their validity. In other words, since the well-being of a city is likely to be different from the well-being of the small areas within that city, using small areas as a geographical unit of analysis may be questionable if the data was not collected at the small scale. Wish (2007) gives an example of New Jersey in the United States. According to the author, the well-being "in a New Jersey suburb of Newark is probably more similar to the quality of life offered in a suburb of Boston or Atlanta than it is to the quality of life that exists in Newark's downtown area." The author further mentions that there would be major differences in well-being even within cities, especially those areas that form part of the largest urban areas. This is exactly the reason for this study to try and establish a detailed sub-city measurement of the indicators.

The components or dimensions, indices and indicators that are used in definitions of well-being may also pose as a challenge in measuring well-being. There seems to be no agreements in the literature as to which components make up well-being although common elements abound. While some authors refer to five components when measuring well-being, others may focus on nine (see Section 3). In addition, there is the challenge in using different indices and variables to make up these components. Indices often combine not only apples and bananas, but lemons and grapes as well. To give an example, author Liu (2004) used about 50 indicators to measure the social aspect of well-being. In this measure, the author included indicators such as the unemployment rate of females, the ratio of male to female

unemployment, average household income, individual health measures, per capita local government expenditures on education to name a few. To complicate this further, the author used some of the same indicators to measure social, economic and political components.

13. Proposed framework

13.1 Foundation for the framework for assessing spatial determinants of well-being

For the current project that aims to develop a framework for assessing well-being for South African cities, one framework stands out in terms of not only its simplicity and clarity but also its applicability to a framework for a developmental approach to South African well-being: the Social Progress Index. This concept of a number of domains which are progressive – people moving through increasing levels of well-being: from the provision of basic needs, through to obtaining the foundation for improved well-being, and then claiming or actualising opportunities for well-being on the higher levels – forms the departure point for developing a framework for potentially measuring the spatial determinants of well-being in South African cities at a sub-city scale.

The Social Progress Index framework includes three basic domains relating to **Basic Human Needs**, **Foundations for Well-being** and **Opportunity.** Each of these domains has four components and its 50 indicators are grouped accordingly in this framework (see Table 1 for more detail).

An initial adaptation of the Social Progress Index (Social Progress Index, 2017) is shown in Figure 6 below. The figure shows a simple three-level grouping different components of well-being as the basis of an exploration of the different spatial levels of influence.

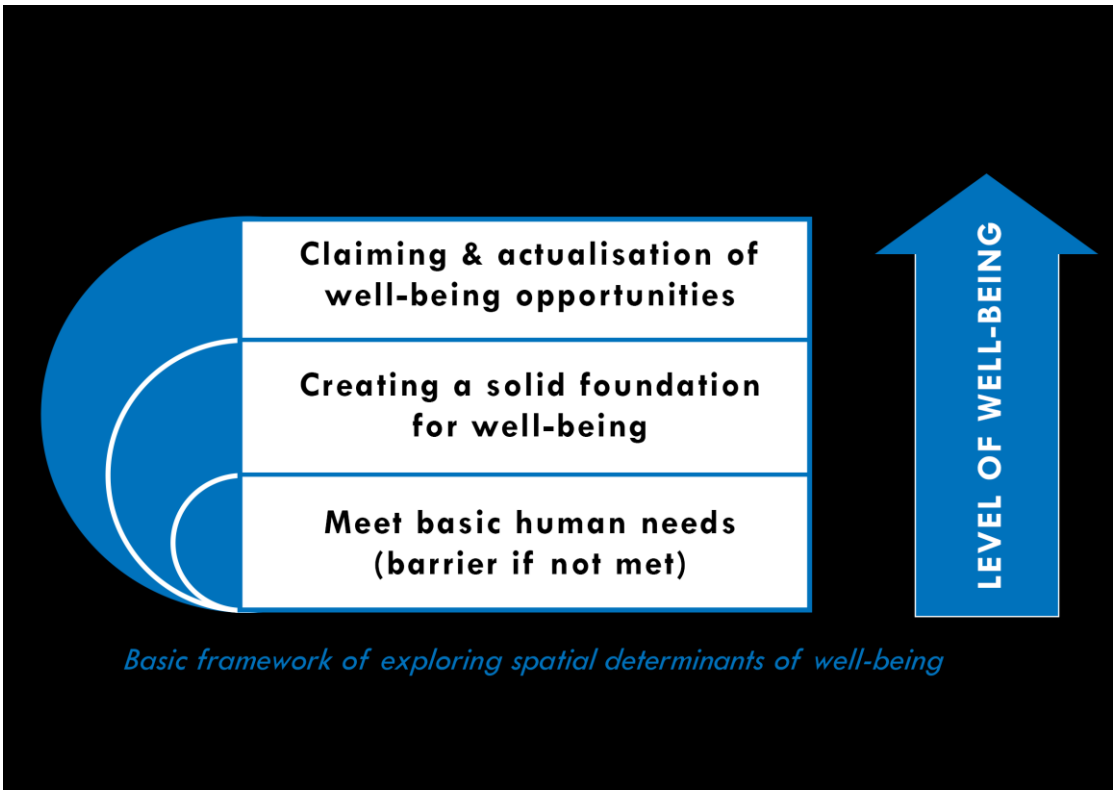

Figure 7: Adaptation of the Basic Domains of Well-being of the Social Progress Index (2017)

To achieve higher well-being increasing levels of human needs or requirements must be met. There is no explicit relationship between where the component is delivered in space and how it impacts on and within people in space. That is to say that municipal, provincial or national policy can have an influence at a local scale while local actions or lack of basic services can influence or limit how people experience their community, their city and the economy. While each component could potentially have a specific spatial footprint, those of basic needs are specifically provided and measurable to the local scale while the other components, which are measurable with respect to outcomes at the local scale, may be are dependent on actions in an adjoining ward, the availability of and affordability of public transport or the specific route alignment, distance to other parts of the city or may be influenced by actions at a higher level such as city governance.

13.2 Approach to framework development

Thus using the Social Progress Index as a base with additional inputs from the other literature, the following broad framework is proposed for the understanding and assessment of well-being and its spatial determinants. The framework is made up of four sub-domains of well-being, presented on a progressive ladder from A to D (see Figure 7) reflecting the

progress from basic human needs (Level A), to Level B (which is improved Quality of Life) once the basic needs of Level A have been met, and then on to Level C encompassing City Liveability and eventually obtaining Life Satisfaction (Level D). The framework indicates the progression to well-being from A to D, but the sub-domains should not be considered as being exclusive and only applicable once the lower level has been obtained or fully satisfied. Rather, the framework indicates that fulfilling a particular sub-domain is more likely to allow for the fulfilment of the higher domain.

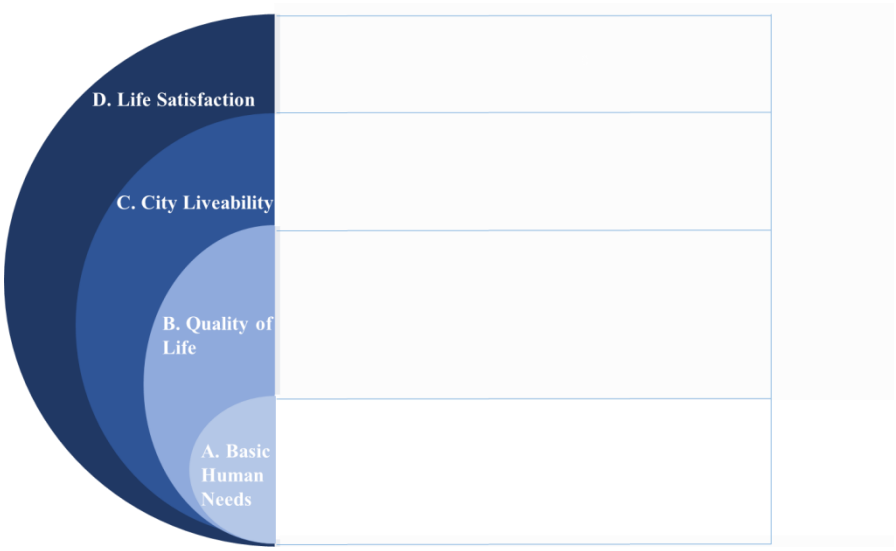

Figure 8: Basic Well-being Framework

The main components of these sub-domains and the suggested areas of measurement are shown in Figure 8 against each of the applicable domains. For instance, on Level A the key components are likely to be A1: Basic Services, A2: Basic Health Care, A3: Nutrition, and so on. The components have been colour coded to indicate differences on how they may be measured. The blue boxes indicate measures which have been identified as being both spatial and objective; whereas the orange variables are mostly subjective and qualitative in nature (data for these variables is more difficult and expensive to collect and may entail extensive personal surveys to achieve high levels of data confidence at a ward level). The measures shown in grey boxes are objective in nature, but there is uncertainty as to the ways in which they can be measured. Details of the proposed measures and the specific indicators to be used in the framework are discussed included as Table 2.

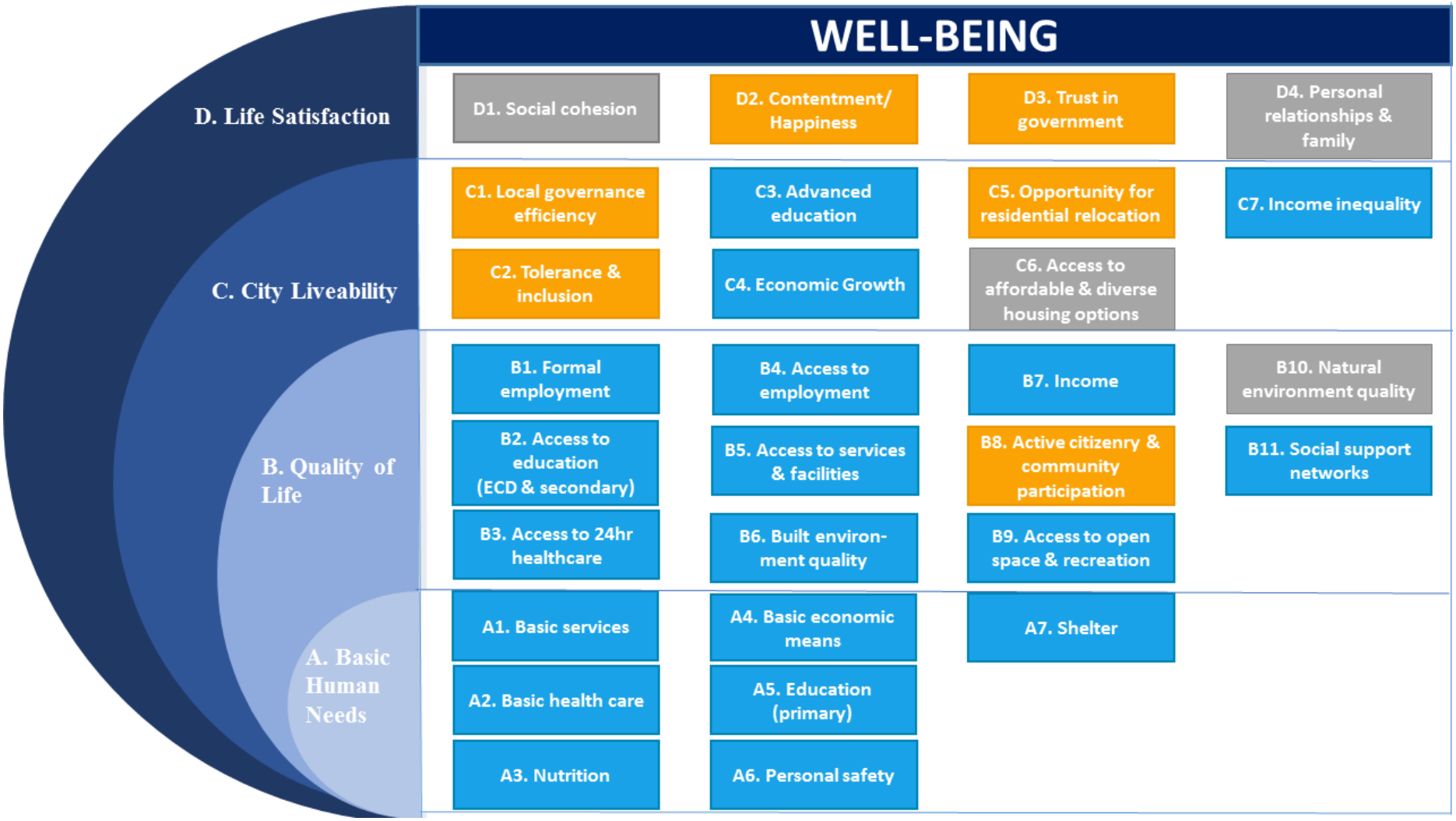

Figure 9: **Proposed framework for evaluating well-being**

The **Basic Human Needs** domain is very much about the basic human needs that form the solid foundation required for well-being of all citizens. The provision of basic municipal services such as clean water, sanitation, and electricity are key determinants of well-being. In addition to these services, access to adequate nutrition, basic medical care, primary school education, basic social grants, adequate housing (shelter) as well as a safe environment are necessities. These factors contribute to an individual's basic needs requirement and their absence entails a significant barrier to well-being; although, provision of these components cannot guarantee well-being. These household services and conditions are provided and can be measured at an Enumerator Area (census) or ward level. The other important components that form part of basic needs include access to social welfare security as well as personal safety.

The **Quality of Life** domain builds on the foundation of basic needs and covers aspects of well-being related to increased levels of education and access to higher order social services such as 24-hour medical care, citizen registration and secondary education, as well as the means to access employment (such as affordable public transport services) and social support networks. These components speak to a person's relative location within a city and relate to how well the place in which an individual is located and connected to other areas in a city enable a full range of services to be accessed. Education and skills training are important to secure dignified employment and social support networks, which may include such factors as local role models in the community and sound family values, support and stimulate educational achievements and other life goals. A sense of community, empowerment and self-reliance can foster improved well-being. Many surveys including NIDS indicate that access to employment is highly likely based on access to community networks and word-of-mouth.

The domain of **City Liveability** is about measuring the performance of a city as a contributor to well-being at a city-wide level and the focus is largely on how the city functions as a whole In meeting people's needs. As can be seen in the figure, some of the indicators are more subjective in nature and are about how people experience and are able to use or feel secure in different spaces. The indicators focus more on how individuals feel about the cities in which they live and include indicators such as opportunities to move to other residential areas and housing options, income inequality, attitudes to local governance and feelings of tolerance and inclusion.

The framework then represents **Life Satisfaction** as the highest level of well-being achievable. This domain encompasses a great deal of subjectivity and relies heavily on family relationships, happiness and community cohesion as inputs . The latter are relative measures for many reasons, and assessments will have to consider people's changing and

growing expectations and high levels of materialism (especially among South African youth and the many people coming from backgrounds of great deprivation) when measuring these aspects of well-being.

Overall well-being is then the resultant outcome of a complex interrelationship of all the domains from the most basic human needs to the attainment of life satisfaction. It is evident from the framework that almost everything in our lives affects well-being. This makes it challenging to select the most important determinants of well-being to evaluate and map. However, the purpose of the framework is to provide a holistic view of the main spatial determinants of well-being and in each domain and its associated components a number of key indicators has been selected for assessment of the components. It is unlikely that there is a direct causal relationship between the determinants and human well-being or that any single indicator or determinant on its own is likely to influence well-being. It is rather the realisation of several key components within the same spatial context that is likely to achieve the desired outcome over a sustained period of action.

13.3 Selection of well-being indicators

As mentioned in previous sections, almost everything in our lives affects well-being, so it is challenging to select not only the key determinants of well-being but also the related indicators of well-being to be measured. The purpose of the framework is thus to provide a holistic view of the main spatial determinants of well-being and a range of key related well-being indicators.

Authors Brown et al. (undated), in their Happy Cities Framework outlined some measurement criteria of which some proved useful for the purposes of our framework. The authors point to availability of data as one of the critical factors for the selection of which indicators and variables to use. In addition to this, the selected indicators should at least cover the key elements of the domains for which they are proposed to provide measures for; the indicator set should also include a mixture of both objective and subjective measures – an approach which has been favoured by most well-being frameworks and indicator sets – to account for the complexities and multi-dimensionality of the issue of well-being. Apart from this, it is also important to ensure that the selected indicators provide accurate measures of what they claim to measure and that they should be easy for non-specialists to be able to understand and interpret the results. The scale of the data collection should also be compatible with the scale at which the data is to be presented, mapped and interpreted.

The following table provides a summary of the possible databases that were available for use and which could potentially be used to evaluate some of the many well-being indicators. Annexures A and B provide further information in this regard.

Table 3: Possible databases for sourcing spatial determinant indicators

Database	Usable Scale (statistically valid)	Types of indicators in databases	Years & Frequency
1. Stats SA	EA level	Objective variables; focus is more on basic services, income and demographic datasets as one of the groups of indicators for well-being.	Census 1996, 2001 & 2011
2. Household Survey	Municipal level	Focus is on basic services and demographic datasets.	Annually since 2002
3. NIDS	National	Subjective indicators including poverty, employment and inequality.	Biennially 2008, 2010, 2012 & 2014
4. SASAS	EA	Wide range of subjective and objective indicators including: intergroup relations, protest actions and governance.	Annually since 2003
5. AfroBarometer	National	Subjective indicators related to public attitudes such as governance, democracy and economic conditions.	Annually since 1999. Latest available surveys (2015)
6. GCRO	Wards in Gauteng only	Subjective indicators including standard of life satisfaction, socio-political attitudes and basic services.	Conducted biennially 2009, 2011, 2013 & 2015

It is important to note that only the StatsSA data and the GCRO data are collected with sufficiently large sample sizes at the ward level to confidently allow mapping of these indicators at a ward level sub-city spatial scale to show the differences between parts of a city. Furthermore what is important to note from the various datasets (except that of StatsSA which is somewhat more generic) is that each was designed with a very specific purpose in mind. One can thus assume that a specific dataset provides us with some

indication of the specific phenomena that the survey is trying to understand, but there is no certainty in that. This makes it challenging to use data collected for one purpose and be confident that it will be able to fully explore a different phenomenon from that which was intended. When measuring a complex concept such as well-being it is generally best to design a specialised survey based on the specific concept once it is fully defined and understood since only once the concept has been defined, can a suitable instrument be develop to test the phenomena. The reason for this is that some of the datasets and their indicators listed may have a significant correlation with what we want to measure, however, it is necessary to first undertake rigorous statistical and empirically analysis to prove the relationship, before one can use it with confidence. This has not been possible in this case and the use of indictors although carefully considered may not be statistically the best possible choice of indicators. What the latter means is that based on the definition of the concept a validated measurement tool (e.g. a questionnaire) should ideally be developed and then tested in a case study in a specific geographical area. In this case the study has been limited to testing the framework using either outdated data for all cities (StatsSA) or limiting the testing to Gauteng and using the GCRO data to map individual indicators and to compare this to some form of income or Living Level Index as the only possible viable option. This is since the datasets that one requires to test the validity of being able to measure a specific the phenomena that one is interested in, needs to be available for that same study area and at the same scale of detail. One also needs to be very clear on the geographical level of detail one wants the survey to be representative of such as suburb, ward, municipality. The reason for that is that it impacts on the sample size needed to get a representative sample. The more spatial detail one wants, the larger the sample needed. The smaller the scale of accuracy required, the larger the sample size required and the higher the likely cost of survey if it is not possible to use other data sources. Once such a survey has been done, using a validated measurement tool, the results can be used to see how well any of the identified alternative datasets are a predictor of the same phenomena or then aspects thereof.

This is the process required if there is a requirement to use existing survey instruments without any alteration. The alternative is to influence the current survey instruments being used by e.g. StatsSA or GCRO to include specific questions to enable greater alignment to selected domains and indicators. In other words, once we have defined the concept we want to measure, and developed and tested the relevant survey questions, it can be included into the broader survey by StatsSA or any other relevant survey process. This may include, for example, longevity measurement at ward level, place of work, mode of travel to work, a hunger or nutrition related questions to name but a few that are critical to well-being assessment.

As indicated earlier the different databases listed are for various levels of detail. Underlying that is mainly two reasons. The first is the level of detail required for each purpose. In other words the scale at which the study wants to say something about a specific phenomenon, for instance on a national, provincial or ward level. It is noted from the literature that most Happiness and well-being indicators are done at a national level to enable international level comparison. Secondly, is that the level of detail is dictated by the budget or costs involved in the survey as the more detail one wants, the bigger the sample and therefor more expensive. The problem when working with a multitude of secondary data sources at various levels of detail is that it is only comparable at the same level as the coarsest dataset. I.e. if there are two datasets and the one is for wards in Gauteng Province and the other at a metro level, one can only compare the two datasets reliably at a metro level of detail.

Lastly, it is necessary to decide on how regularly it is needed to measure the phenomena in order to undertake monitoring and evaluation of the interventions and the effectiveness thereof in addressing the concerns identified in the first place.

Thus in summary and ideally in order effectively measure a phenomenon such as well-being it is necessary to:

- ⇒ Get agreement on the definition of the concept to be measured;
- ⇒ Based on the definition identify the various aspects;
- ⇒ Develop a measurement instrument based on the above
- ⇒ Test and validate the instrument;
- ⇒ Then use the instrument to either:
    - Test what secondary sources have a strong correlation with what we want to know;
    - Include the e.g. specific questions in existing instruments; or
    - Do a specific survey on large scale.

13.4 Identified indicators for measuring well-being

Given the above and the limitations of the existing data it was at least possible to select a number of indicators that could be used to evaluate well-being - but only for the Gauteng province. There were a few basic reasons; firstly the availability of data at the ward level for four time periods up to 2015 as well as the ability to select at least one typical indicator for each component that could be measured. This could also be compared to the LSM data for 2013. However, for some indicators such as access to health and education a new analysis was required to provide a proxy indicator of access which did not fully address the component as it did not include aspects of either capacity of sufficient class rooms or the quality of that education.

That being said for each of the four domains making up the proposed framework and for each of the several components one or more indicators (a detailed table of these is presented at the end of this section) was selected for testing and measurement. A considerable effort was dedicated to identifying the indicators that best describe the well-being components. For Basic Human Life domain, seven components were identified namely: basic services, basic healthcare, nutrition, basic economic means, primary education, personal safety and shelter. Each of these components together makes up the components grouped as basic human needs. To measure these components, an indicator was selected for use or in some cases a new measure was calculated; for example, a distance only based accessibility analysis of clinics was conducted as the best available means to describe the basic health care component. This was done based on the basic access norm of five kilometre access standard. This essentially means that, that populations falling within a five kilometre radius of a clinic were considered served while those beyond that are unserved, Quality and capacity could not be considered due to data constraints and no comparison over time is possible Similarly under Quality of Life domain, 11 components were identified; these include: people in formal employment, access to ECDs and secondary education, access to 24-hour healthcare, cost of access to employment, access distance to social services and facilities, built environment quality, income, active and involved citizenry (not exercise related) and community participation, access to open space and recreation, natural environment quality, and social support networks. It should be noted that indicators falling within this domain can be measured at EA or city scale. As a proxy for travel access to employment component for example, the average household income spent on transport could be measured and mapped. In this case, two options are available: we could extract average travel cost of public transport trips to work from the Urban Sim data or from GCRO we can select a percentage of trips done for work purposes in each ward and there is also an indication of how much respondents spend on transport per month.

The City Liveability domain comprises the following seven components: local governance and efficiency, tolerance and inclusion, advanced education, economic growth, opportunity for residential relocation, access to affordable and diverse housing options, and income inequality. These components all together help define how the city function as a whole. The percentage of people with tertiary qualification was selected as an indicator for advanced education. It is universally recognised that that higher qualified/skilled people are more likely find better paid employment and potential to improve their well-being.

Under Life Satisfaction domain, four components were identified namely: social cohesion, contentment or happiness, trust in local government, and personal relationships and family. To help understand happiness in our cities, the GCRO recorded the number of respondents in Gauteng wards who are happy with their standard of living. This can be seen as a good

indicator for happiness/contentment. Moreover, to understand social cohesion in our cities, racial composite in the area is sometimes used as a close indicator to social cohesion, however it was decided not to use this as it seems that social class is being considered by many to be more relevant to change in South Africa and no measure of this is yet available for use.

Table 4: Proposed framework

A. Basic Human Needs

Components	Indicators	Measures	Data related comments
A1: Basic services Having basic services within your ward, street or suburb	Water	% of households with on-site taps	Data for these measures can be sourced from GCRO at a ward level.
	Electricity	% of households with electricity	
	Sanitation	% of households with on-site flushing toilets	
A2: Basic health care	Access to primary health care services	Accessibility study – clinic within 5km	Clinic location data is not available at this stage for the whole of Gauteng only for Jo'burg and Tshwane
	Birth rate	Live births per year per 1 000 population	Data for this measure is currently not available at ward level.
A3: Nutrition	Hunger	% households which ran out of money to buy food for 5+ days during the month	Data for this measure can be sourced from GCRO at a ward level.
A4: Basic economic means Safety net for income	% below poverty line	% households with combined income of less than R 1 600 per month from four household members	Available from GCRO and StatsSA. Relates to 4 household members combined earnings of less than R 1 600 per month.
	Social grant access	% receiving government grant	Available from GCRO at a ward level as %. SASSA data requested
	Unemployment	No. of unemployed (15–64 years) per 1 000 population	Data for this measure is sourced from Stats SA but at a municipal level.
	Dependency ratio	No. dependents per person working in a household	Available from GCRO. Also relates to the number of people younger than 18 years in a household.

Components	Indicators	Measures	Data related comments
A5. Education (primary)	ECD enrolment/ school readiness	ECD enrolment per 1 000 population (5 years or younger)	Department of Social Development ECD enrolment at government supported facilities
	Primary education enrolment	6 – 12 year olds enrolment per 1 000 population	Can be calculated based on 2 or more StatsSA variables
	Adult literacy	Persons over 18 with Grade 9 or higher	Stats SA data
	Primary school access	Less than 5km to primary school	Accessibility analysis of primary schools by the CSIR
A6. Personal safety	Availability of street lighting	No. people satisfied with street lighting	Data can be sourced from GCRO at a ward level
	General safety	No. victims of crime in the past year	Data can be sourced from GCRO at a ward level.
	SAPS services	Accessibility study – police station within 5km	SAPS point data will need to be provided. Data not available for EMS.
A7: Shelter	Affordable shelter options – range of housing types	Types of dwellings per ward	Data is not available for this measure and is difficult to obtain.
	Overcrowding (persons/room)	% households with over 6 people per room	GCRO has data on no. of household members; however number of rooms per dwelling is unknown.
	Security of tenure(rental or ownership)	% respondents who own accommodation (i.e. who are not renting)	Data can be sourced from GCRO at a ward level.

B. Quality of Life

Components	Indicators/ Measures		Data related comments
	EA Level	City Level	
B1: Formal employment		% formal employment	Data for this measure can be sourced from Quantec at a municipal level
		Employment to population ratio	This measure can be extracted from Quantec data which is at municipal level.
	% travel time 60+ min to work		N/A
B2: Access to education (ECDs & secondary)		Average travel distance to secondary schools within 5km	CSIR accessibility analysis study.
		Secondary school enrolment per 1000 population	N/A
		Matric pass rate	Data for this measure is sourced from Stats SA at municipal level or EA level upon request
		% 15 years or older completed 12 years of school	Data for this measure can be sourced from Stats SA at ward level
		Tertiary enrolment per 1000 people?	N/A
B3: Access to 24hr healthcare		Access to hospital within 30km	Previous CSIR accessibility analysis study
	Life expectancy at birth		Data is not available and difficult to obtain.
	% respondents with medical aid or health insurance cover		Data for this measure is sourced from GCRO at a ward level.
B4: Access to employment	Average household income spent on transport to work	Trip time to work	Data for this measure is sourced from GCRO at a ward level.
B5:Access to services & facilities	Distance to the closest home affairs department within 15km		Previous CSIR accessibility analysis study but this was only done for Johannesburg and Tshwane.
B6: Built environment quality			Worth looking at in future study but there are no known suitable indicators at this stage.

Components	Indicators/ Measures		Data related comments
	EA Level	**City Level**	
B8: Active citizenry & community participation		Number of churches in the area	Data for these measures is not readily available and is difficult to acquire.
	Accessibility study – travel distance to community halls		
B9: Access to open space & recreation		% respondents satisfied with parks	Data for this measure can be sourced from GCRO at a ward level
		Access distance to parks/sport facilities	Previous CSIR accessibility analysis study but this was only done for Johannesburg and Tshwane.
B10: Natural environment quality		% land for nature reserves	Previous CSIR accessibility analysis study but this was only done for Johannesburg and Tshwane.
		Air quality	
B11: Social support networks		No. of NGOs in the area	Data not readily available and is difficult to acquire.
		No. of social or church groups in the area.	

C. City Liveability

Components	Indicators/ Measures	Data related comments
C1: Local governance efficiency	% households that have received electricity in 2016	Relates to Municipal Barometer service delivery dataset but this is not available to the CSIR.
	% people who have found a job in year 2016	
C2: Tolerance & inclusion	% of migrants	Data for these measures can be sourced from GCRO at a ward level.
	No. of reported xenophobic attacks	
	Gender balance of employment	
C3: Advanced education	Years of tertiary/skills training	Data can be extracted from GCRO but only relates to number of people with tertiary qualification per household.
	Years of tertiary/skills training by type	
	% with tertiary qualification	Data is sourced from Stats SA at ward level.
C4: Economic growth	Change in GDP per capita	Quantec Data
C5: Opportunity for residential relocation	% respondents who relocated	This information can be sourced from GCRO based on the question: Where did you stay before moving here?
C6: Access to affordable & diverse housing options	Rental cost map	Objective measures but unsure of how these will be measured.
	Property price map	
C7: Income inequality	Gini coefficient	Data for this measure can be sourced from Quantec at a municipal level.

D. Life Satisfaction

Components	Indicators/ Measures	Data related comments
D1: Social cohesion	Racial composition of an area	Data can be extracted from Stats SA at a municipal level.
D2:Contentment/ Happiness	% respondents happy with their standard of living	Data can be sourced from GCRO at a ward level.
D3: Trust in government	% respondents satisfied with the local government	Data can be sourced from GCRO at a ward level
D4: Personal relationships & family		Indicators for this not clear at this stage. Potentially sourced from the GCRO surveys.

14. Mapping and testing of selected indicators

Based on the well-being framework, we have attempted to explore various indicators that are considered to contribute to an understanding of well-being. In exploring these indicators, we have used the GCRO, StatsSA and CSIR datasets to map various well-being components. The indicators mapped here are grouped under the four domains used in the Well-Being Framework; namely, Basic Human Needs, Quality of Life, City Liveability and Life Satisfaction. Although these indicators are mapped separately, they all contribute to the understanding of well-being in one way or another. It must, however, be pointed out that no statistical analysis or correlation testing could be conducted to check the specific impact of each indicator on well-being. Such a process is an intensive data exercise requiring extensive time and specific expertise. Regression analysis will be required to test the validity of specific indicators once all the data can be assembled in the same format for all the areas.

The data could potentially be overlaid with a layer of former townships (which we were unable to access timeously) or LSM to enable a more informed analysis and evaluation of these indicators as they relate to well-being. Owing to data limitations only a selected number of indicators are measured and presented in this document.

14.1 LSM Levels

The 30 years of well-being research in South Africa (undertaken by Prof Møller and Ben Rogers amongst others) have shown a strong correlation between revealed well-being and LSM levels. A map of 2013 LSM levels for Gauteng has been overlaid with population density in Figure 10.

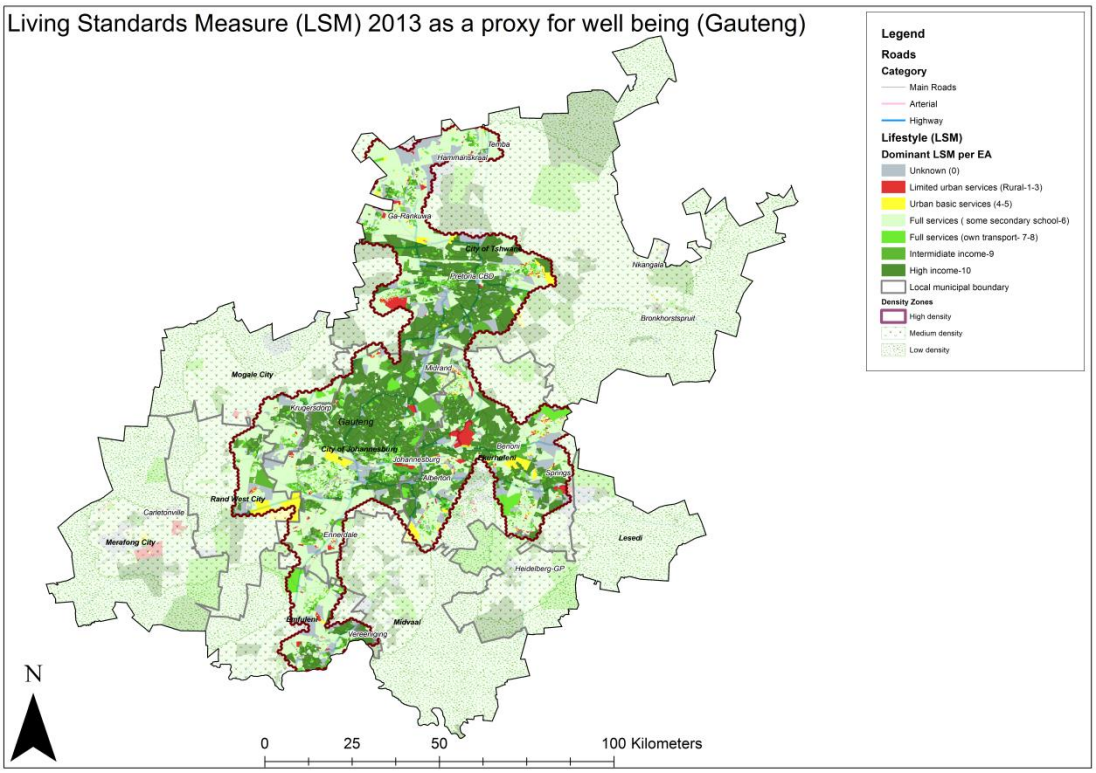

Figure 10: Living Standards Measure (LSM) as a proxy for well-being (Gauteng)

As indicated earlier this LSM measure will in future no longer be compiled for marketing purposes, but since the approach is well documented this can potentially be replicated by others and can be considered as a potential means of tracking change in well-being over time. However, since it too depends on census data it will soon become outdated if no value addition or future projections are undertaken. Instead, the Neighbourhood Living Index is being produced and will be made available at a fee on a regular basis. The correlation of this index with well-being levels is yet to be verified and only a small sample data set has been provided to the CSIR for evaluation. This small set of sample data for this indicator is mapped in Figure 11 below. This has not been compared to the LSM data or tested for use.

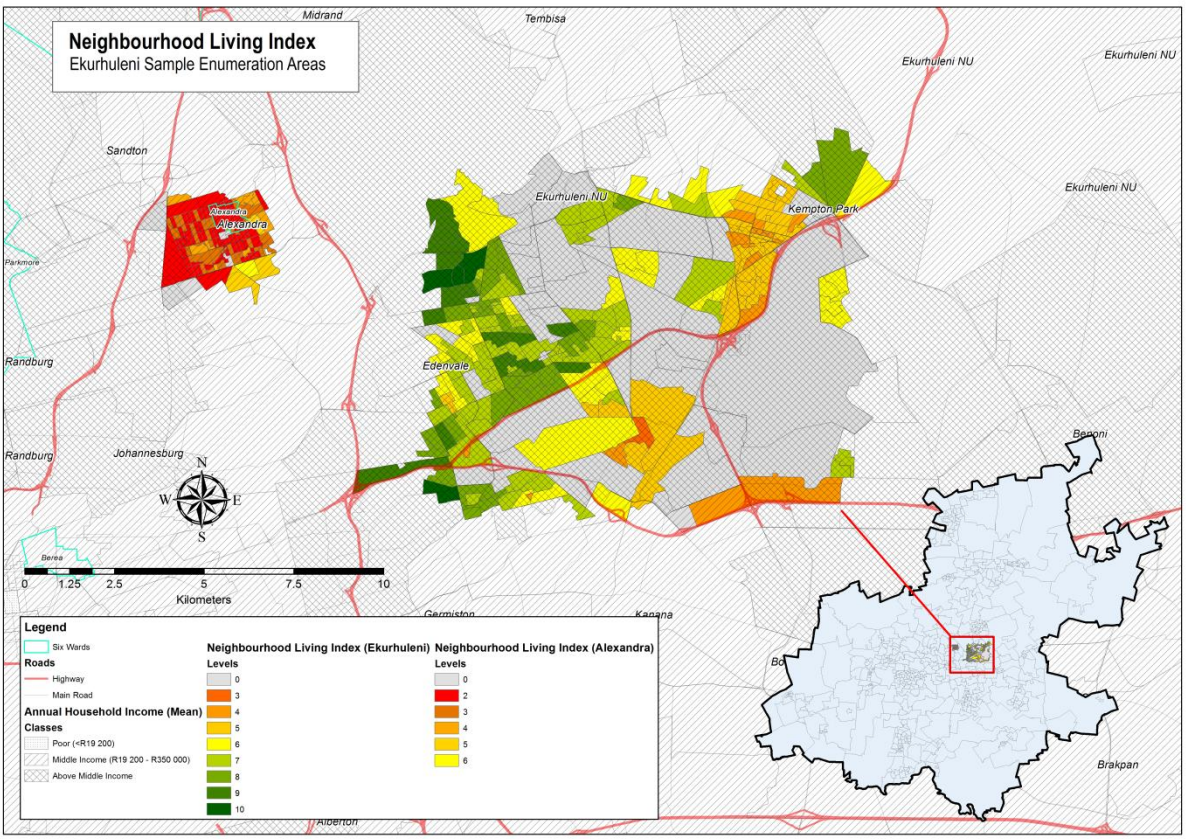

Figure 11: Neighbourhood Living Index and mean annual household income

The GCRO data provides the most complete and recent set of data that could be used to test the proposed well-being framework; however, since it was not possible to access the raw data, no correlations were tested, although a range of example data sets have been mapped to try to reveal if any patterns of well-being are directly evident or if the indicator has spatial relevance. Initially a selection of maps has been used to spatially indicate differences in well-being in the province. With respect to the use of the GCRO data, consideration was also given to running a regression analysis of the variables to see which best correlated to other selected variables such as average household income per ward, LSM level or similar. However, given the format of the data and the time available this was not possible. It was also not feasible to either reconstruct or compare the GCRO Quality of Life Index with either LSM levels (which is said to correlate well with well-being in South Africa) or to test it against other variables in a manner that was statistically valid and that would enable it to be used as a proxy for measuring well-being in terms of the proposed framework.

A further option that was used to try and understand the spatiality of well-being was to compare specific variables for six selected wards within northern Johannesburg with each other. For a discussion of this approach please refer to the end of this section.

In the sections that follow various well-being indicators are mapped. They are grouped into each of the four domains of in the framework. The 2011 mean annual household income from StatsSA was used in each case as an explanatory or comparative component as household income is known to closely be linked to many aspects of well-being – although it does not account for some of the more social or subjective components.

14.2 Basic Human Needs

Figure 12 shows the percentage of respondents with piped on-site (yard) water in Gauteng measured per ward in relation to income. Access to clean running water is one of the necessities in every person's life and absence of this may entail a barrier to wellbeing. As can

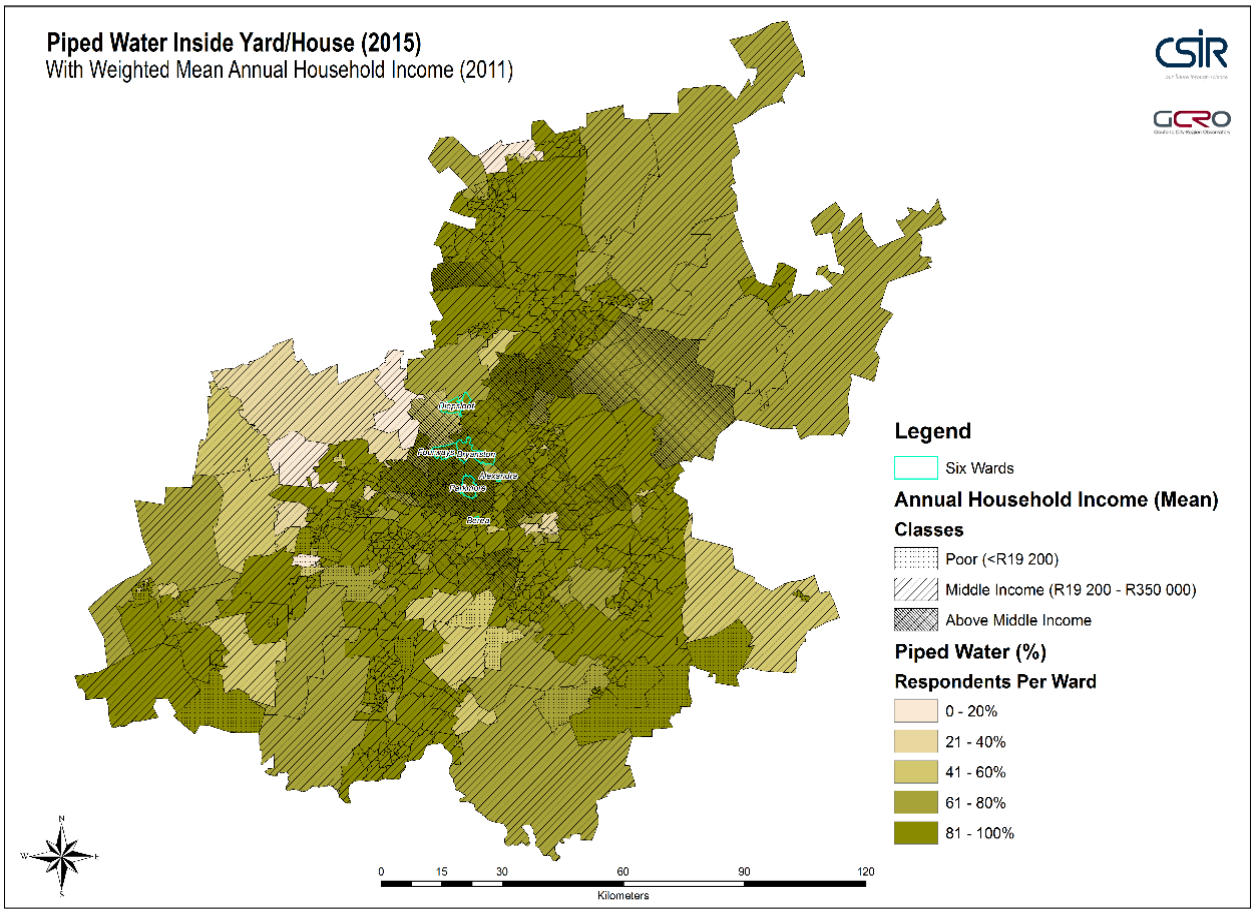

Figure 12: Percentage of respondents with on-site piped water in relation to income per ward

be seen on the map, large parts of the province have access to clean water and overall this suggests that many households have on-site taps, especially in the central densely populated areas (see previous map). It is noticeable from the map that some middle-income areas have lower access to on-site water in comparison to the low-income households, but this is more likely in the rural areas of the province. Although areas with low access to piped water can be distinguished from areas of high access, it is difficult to infer any clear link to well-being.

Nutrition is a key determinant of health and ultimate well-being and hunger was used as an indicator for this component. The percentage of respondents in Gauteng who ran out of money to buy food at least once in a 12 month period was mapped – the results are shown in Figure 13. Interestingly, the respondents who indicated the need to have skipped a meal at least once in the last year are spatially scattered across the province.

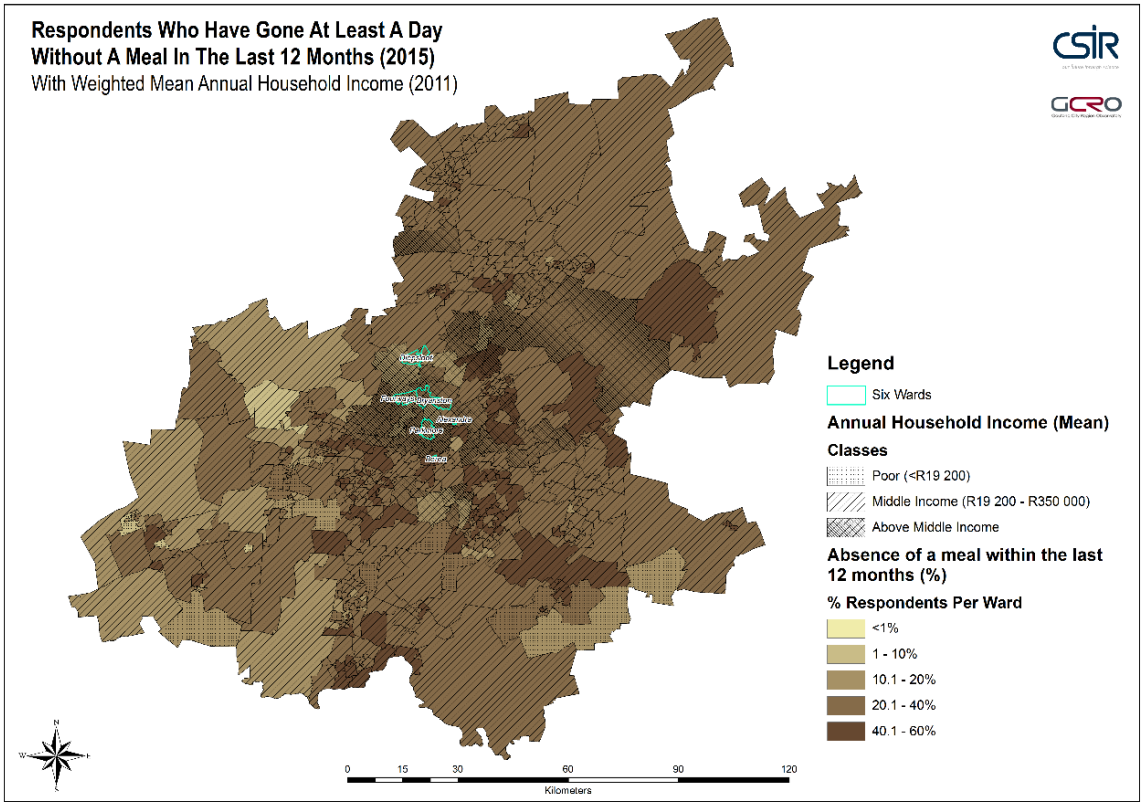

Figure 13: Percentage of respondents who have gone at least a day without a meal in relation to income per ward

The map does not reveal a clear correlation between income and hunger; even within areas of high income there were high percentages of people indicating that they had gone hungry in the past year. Further consideration should be given to comparing this variable to a map of housing types such as informal dwellings or RDP housing.

14.3 Quality of life

Access to 24-hour healthcare is one of the important indicators for quality of life. To show the accessibility of 24-hour healthcare, travel distances to public hospitals were analysed by the CSIR using hospital location data, the road map and applying accessibility analysis techniques. Once again this is compared to income and the results are presented in Figure 14. These travel distances are measured in kilometres and displayed in a range of

colour bands of varying kilometre increments. It is clear that access to public hospitals in Gauteng is good since the majority of the population have access within 20 km (indicated in green in the map). From this map it can be deduced that poor access to hospitals indicates poor quality of life which can ultimately suggest poor well-being in the area. This is more evident in the north-western parts of the province where people travel over 50 km to reach the nearest hospital. Relating this to an income indicator, it is clear that the middle-income class is most affected by longer travel distances to hospitals.

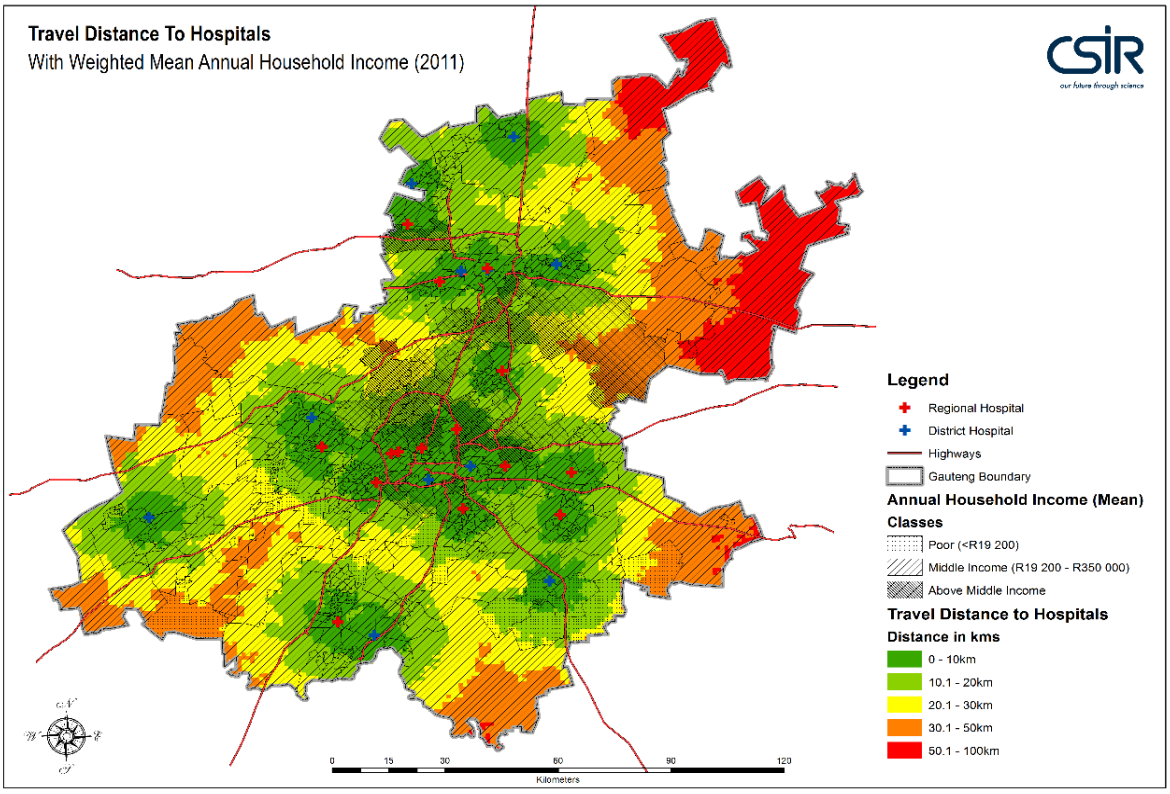

Figure 14: Travel distance to hospitals in Gauteng (per grid cell) and household income

Another indicator for quality of life is access of public spaces and recreation. As a proxy for this indicator we mapped the percentage of respondents who are satisfied with parks as derived from GCRO's Quality of Life survey data (see Figure 15). As can be seen people in the inner-city areas were the most satisfied. This has not been compared to actual park provision; neither is a clear pattern emerging when compared to income.

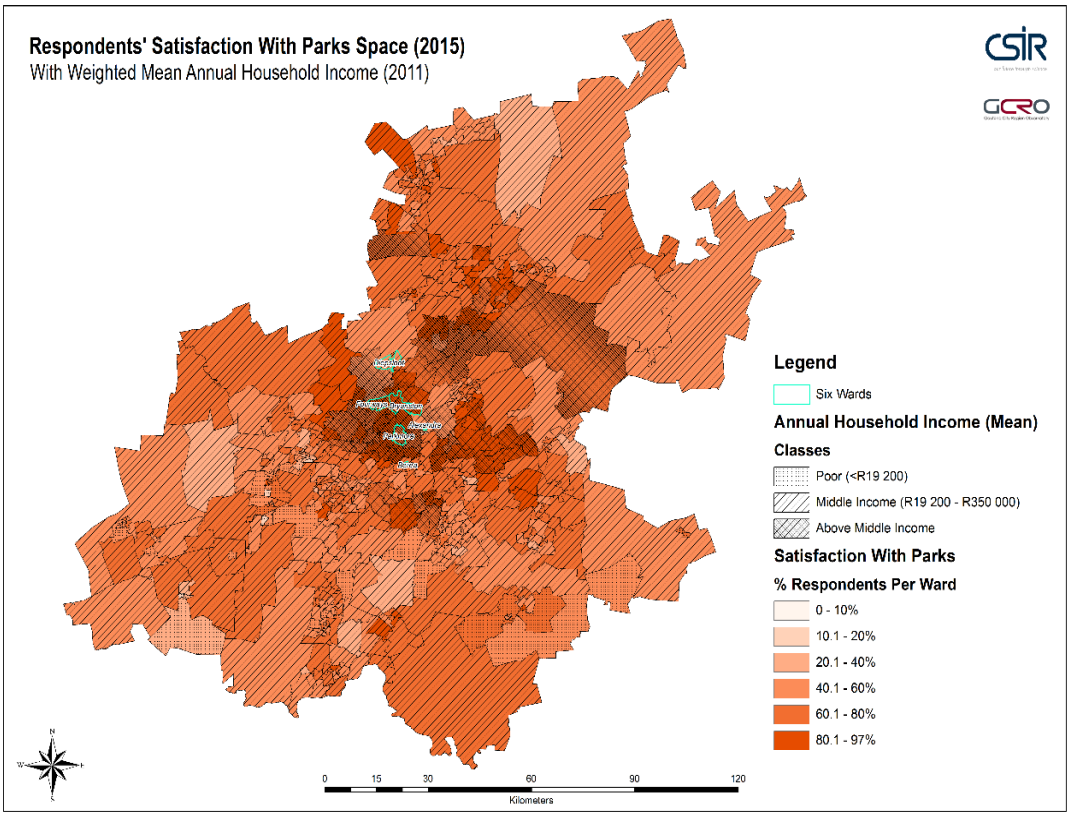

Figure 15: Percentage of respondents satisfied with parks in Gauteng in relation to income in Gauteng

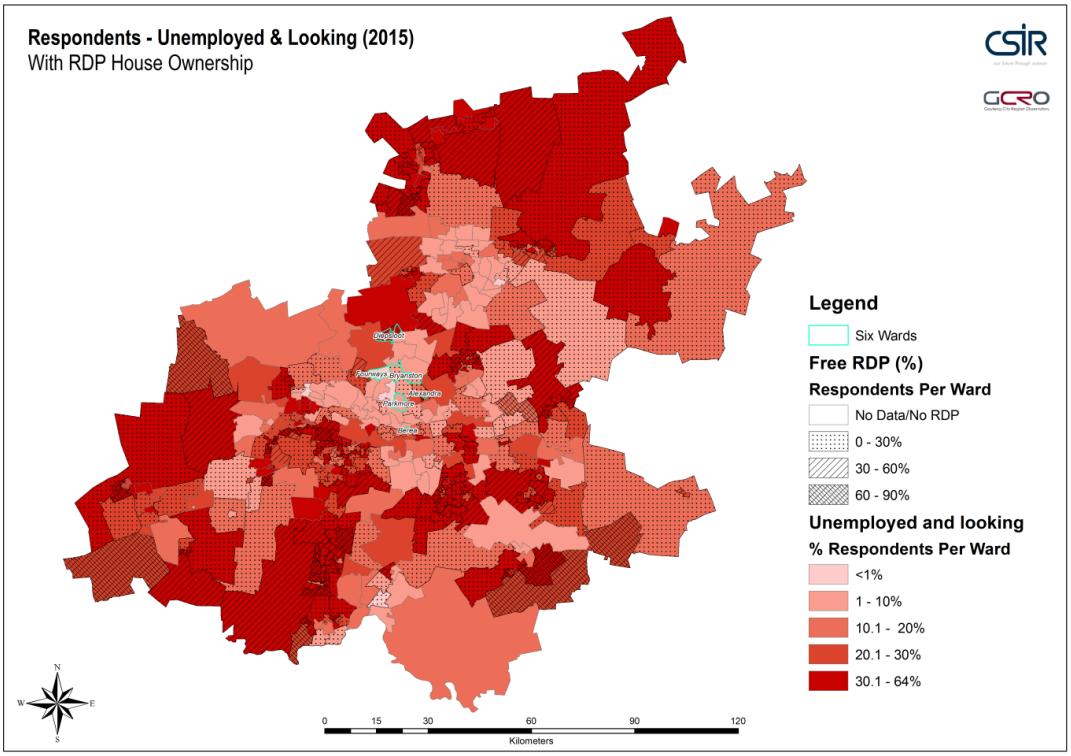

Figure 16: Areas of high unemployment in Gauteng versus RDP houses

The map above (Figure 16) presents the percentage of respondents that indicated they have been unemployed and looking for employment in the GCRO survey of 2015. The hashing on top of the red wards indicates the percentage of RDP houses from the same GCRO study. Visually the map indicates a good correlation between high percentage of RDP house ownership and unemployment. It is also evident that the highest unemployment and RPD house ownership is seen to be somewhat distant from the core urban centres of Gauteng. This may indicated that the location of the RDP houses add to the chances of being marginalized in Gauteng.

14.4 City Liveability

Figure 17 shows the average travel expenditure on public transport within the Ekurhuleni Metropolitan area. This data has been extracted from the Urban Sim model but is not available for most parts of South Africa or even the whole of Gauteng. This was mapped in relation to the location of RDP houses within the Ekurhuleni Metropolitan area. It is clear from the map that there is a correlation between high transport expenditure and areas where RDP houses are mostly concentrated. The latter implies that RDP housing is poorly located with respect to employment and that this is likely to have a negative impact on well-being.

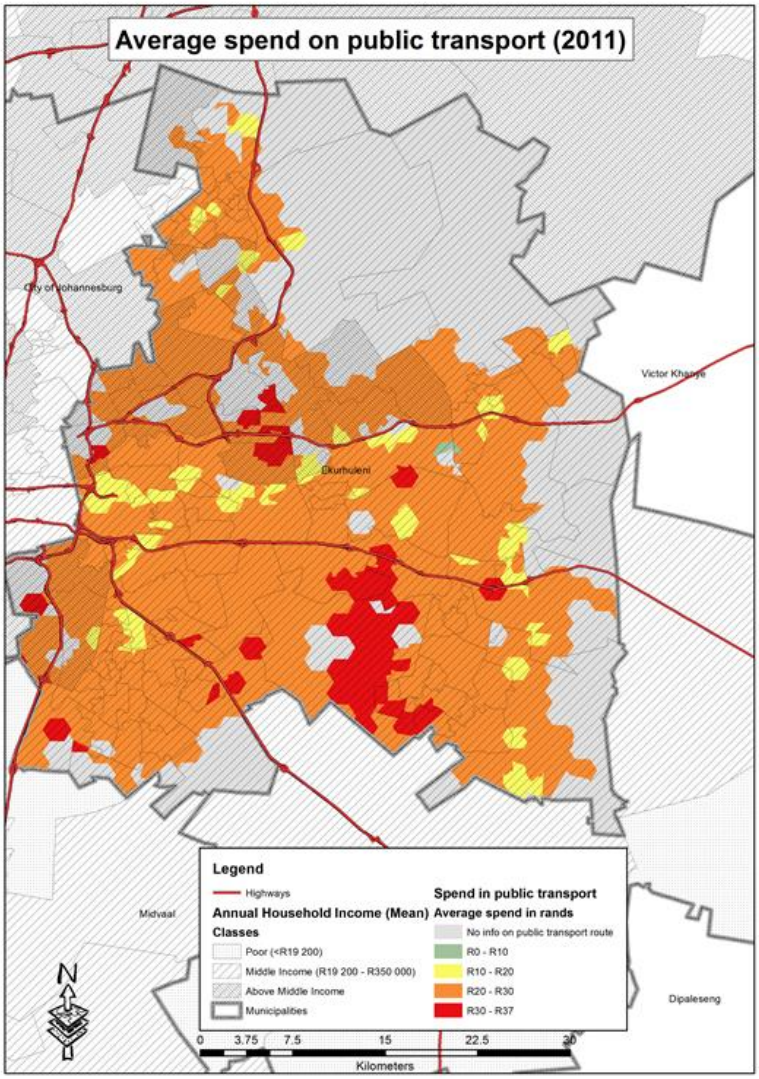

Figure 17: Average cost of public transport cost to work in relation to RDP housing (Source: Urban Sim and GCRO)

14.5 Life Satisfaction

In an attempt to understanding the different spatiality of life satisfaction in Gauteng the percentage of people who indicated that they are satisfied with their standard of living was mapped (see Figure 18). The map shows overall levels of life satisfaction and clear differences within different parts of the province. There is some indication that there is a correlation with income (see areas in red) such that low levels of satisfaction are more likely in low-income areas. Much more analysis will be required to explain all the underlying components that go into how people feel about their life satisfaction. Middle and high income people in general seem to be more satisfied.

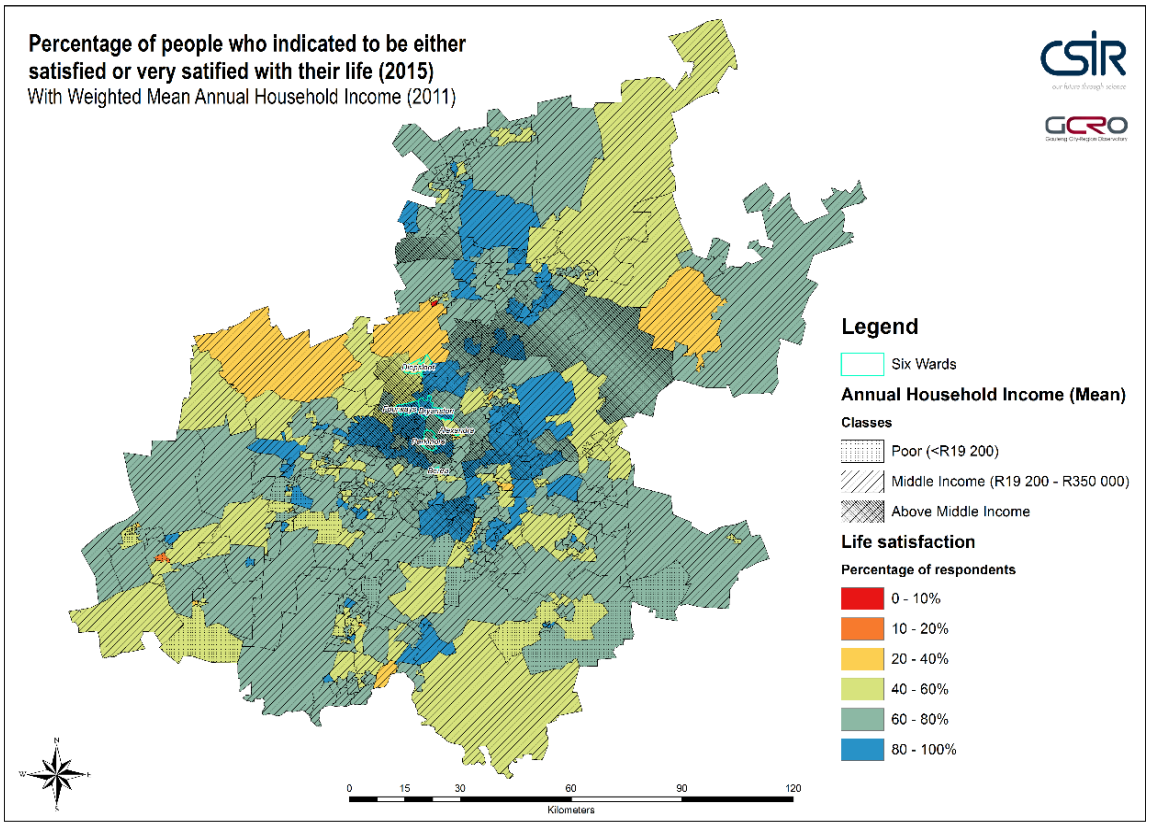

Figure 18: Percentage of respondents satisfied with their standard of living (Source: GCRO)

While the maps shown in the previous pages illustrate specific spatial differences in well-being components, there is no immediately obvious link between the various spatial determinants and well-being or quality of life. Thus, consideration was given to a different approach and to look at a range of indicators for selected small areas (wards in selected suburbs) as a means of understanding the spatial determinants.

14.6 The story of six wards in Johannesburg

The relationship between the GCRO Quality of Life Index has not yet been tested in terms well-being levels, it can be considered as a useful benchmark against which to compare six selected wards Johannesburg with each other. The areas were 'randomly' selected based on a visual inspection and choosing suburbs with varying densities, different intensity of f urban streets and different block sizes. For each of the areas, five indicators that relate to well-being were selected and compared with the GCRO Quality of Life Index. The components covered included: percentage of the households that earn less than R1 600 per month; the percentage who live in informal dwellings; the percentage that have a post-matric diploma/degree; the percentage who were forced to skip a meal in the past 12 months; as well as the percentage that were victims of crime.

Comparison of six wards in Johannesburg based on CGRO QoL survey data 2013

Alexandra
Ward id: 79800116

Quality of Life Index
5.36

- 33% of the households earn less than R1600 per month
- 26% live in informal dwellings
- 11% have post matric diploma/degree
- 28% have skipped a meal in the last 12 months; and
- 21% were victims of crime in the last year

Fourways
Ward id: 79800115

Quality of Life Index
7.42

- Only 5% of the households earn less than R1600 per month
- 0% live in informal dwellings
- 78% have post matric diploma/degree
- Only 1% have skipped a meal in the last 12 months; and
- 9% were victims of crime in the last year

Diepsloot
Ward id: 79800113

Quality of Life Index
5.56

- 32% of the households earn less than R1600 per month
- 45% live in informal dwellings
- 6% have post matric diploma/degree
- 17% have skipped a meal in the last 12 months; and
- 25% were victims of crime in the last year

Parkmore
Ward id: 79800090

Quality of Life Index
7.43

- Only 2% of the households earn less than R1600 per month
- 0% live in informal dwellings
- 72% have post matric diploma/degree
- 0% have skipped a meal in the last 12 months; and
- 15% were victims of crime in the last year

Berea
Ward id: 79800064

Quality of Life Index
5.99

- 11% of the households earn less than R1600 per month
- 0% live in informal dwellings
- 18% have post matric diploma/degree
- 5% have skipped a meal in the last 12 months; and
- 30% were victims of crime in the last year

Bryanston
Ward id: 79800106

Quality of Life Index
7.71

- Only 2% of the households earn less than R1600 per month
- 12% live in informal dwellings
- 71% have post matric diploma/degree
- 0% have skipped a meal in the last 12 months; and
- 11% were victims of crime in the last year

Figure 19: The story of 6 wards in Johannesburg

As can be seen in the table above there is a clear link between the three areas with Quality of Life scores above 7 and the low percentages of households with an income of less than R1 600, the high levels of tertiary education and even the lower levels of crime experienced. For the three wards with Quality of Life scores of less than 5.5 the analysis is less straight forward. In comparing the wards in Alexandra and Diepsloot some trends are evident. More people in Alexandra have post-matric education and less live in informal dwellings as opposed to Diepsloot where only 6% have any post-matric training and 45% live in informal structure. On the other hand less people in Diepsloot have been forced to skip a meal. A similar percentage – 32% in Diepsloot and 33% in Alexandra – of households live on less than R1 600 per month and their experience of crime is similar. The GCRO ward level profiles can be used to explore these differences in detail; however, not all variables appear to be available through this option. This approach could prove valuable and should be investigation further in future.

15.Recommendations on the way forward

Whilst providing useful insights in exploring the spatiality of well-being, the current sets of spatial indicators and possible spatial indicators, can in no way shine light on all the multi-facetted dimensions of 'well-being', nor on exploring the causes, implications or directing much needed intervention and action to improve well-being and aid transformation in South African cities.

Qualitative research and explorations of well-being of individuals and/or communities (considering a wide range of well-being dimensions) are adding tremendous value to these understandings, as outlined within various components in the report. Whilst some of these could be scaled up and indicators used to track more qualitative measures of quality of life are improving, these are often still either ad hoc, quite expensive and are not only constrained in relation to demographic, spatial and temporal aspects but suffer from not fully allowing the voices of those whom the indicators should be supporting to be heard and to form an pro-active and substantive part of exploring well-being. Informing a more nuanced and qualitative understanding of well-being, as well as providing possible more real time probes into the nature of well-being, thus remains a current gap.

In addition, another major gap may possibly be the challenging quest of exploring the intended and unintended impact of multi-faceted and multi-stakeholder interventions and changes in complex city landscapes on the well-being of those living and creating livelihoods within cities.

Given tremendous shifts brought about by research into complex adaptive systems, the data revolution and technological breakthroughs brought about by the drive towards the Fourth Industrial Revolution, some alternative options to specifically address these gaps might be worthwhile exploring. In the section below, a number of innovative ways of addressing these gaps are highlighted.

The analysis of the maps at the current juncture makes it difficult to say much about the complex multi-faceted concept of well-being. It is thus proposed that alternative approaches be explored to better understand the spatially of well-being in cities.

15.1. Leveraging Big Data as a spatial determinant of well-being

Social network usage is increasing exponentially, with more than 16 million users in South Africa, according to the SA Social Media Landscape 2018 study conducted by Ornico and World Wide Worx (Ornico, 2017). Since all social media posts are public, it has created a vast amount of open source data which can be leveraged for research purposes.

Sentiment analysis is the automatic analysis of text to capture the underlying attitude in a person's message. A large body of research exists where different techniques have been applied to analyse social media posts to better understand people's behaviour, such as predicting election results (Bermingham & Smeaton, 2011) and determining people's brand preferences (Ghiassi, Skinner, & Zimbra, 2013) for example. People's social media posts may be affected by their physical, emotional and spiritual state. Therefore, it is plausible to infer their well-being by analysing the underlying attitudes in their posts. Depending on the indicators of a person's well-being, different keywords or phrases can be used to classify social media posts and infer people's well-being. By further considering the geo-coded locations of where social media posts were made, the spatial aspect can be added to the analysis.

There are some shortcomings and limitations to this type of analysis. Since social media platforms generate posts at an alarming rate, advanced algorithms have to be implemented to efficiently analyse the millions of social media posts. The data that would be used in such an analysis would also be subject to a sampling bias, since social media is favoured by only parts of the population. Of the people who frequently use social media, the majority disable the geo-tagging capability on their smartphones, and therefore the geo-location of the social media post may not be available. Lastly, since data is collected at a personal level, great care must be taken to maintain complete anonymity in the analysis so that people's identities are protected.

15.2. Using IEC data to explore residential patterns

The IEC data has been processed to find an alternative means to look at changes in city dwellers' area of residence, especially given the shortcomings of the national Census which includes only 'looking at the last movement' of people and only features such information every 10 years. The IEC data uses the voting districts as a base (unit) from where such migration movement is then extracted. It would be possible to consider information at voting district level to extract both the profile of the sending and well as the receiving area. Even if not precisely aligned to other enumerator areas the CSIR has an underlying process that can bridge the gap when using or translating spatial information between units. Comparing the profiles of such sending vs receiving areas could be a valuable input into the process of determining (a change in) well-being.

15.3. Adaptive orientated real-time qualitative sense-making

A specific example of an innovative research (probing as well as sense-making) approach, methodology and set of tools to support research in complex and fast changing systems, but particularly to support real-time monitoring and possible adaptation, is that of Cognitive Edge's SenseMaker® which is:

> [A] software ecology which integrates decision support, research, monitoring and knowledge management. Described as the first example of distributed ethnography by a leading anthropologist in the British Government, the software represents a radically new approach to narrative research. Future developments include the creation of human sensor networks to generate new approaches to evidence strategy and a range of foresight tools. The first App version of the software was launched in 2012. (www.cognitive-edge.com/about-us)

Whilst the 'tool' as such is a licenced product of which the value could be explored, it is based on (and has been developed over time) by David Snowden and collaborators using the well-known Cynefin Framework (see http://cognitive-edge.com/sensemaker/#sensemaker-about). The SenseMaker® enables research, monitoring and evaluation that support active participation, not merely as a participative research method but as a method such that:

- The research and well designed (and tested) probing questions are open-ended, making use of narratives that participants opt to share, thus eliciting anecdotal experiences from participants as a method designed to (i) create a meaningful context for participants to then self-interpret such experiences; (ii) avoid direct question bias that (especially related to well-being as such a wide and complex construct) restricts enquiry through pre-determined categories as well as the bias of interviewer hypothesises;
- There is close to real-time capturing and 'sense-making' of such narratives;
- There is scalable, temporal, demographic and spatially comparative sense-making;

- There is access to and 'views' on generated data that enables (i) real-time and continuous exploration of the constructs (and or tracking change) in complex adaptive and context specific ways; (ii) highly effective and visual quantitative, qualitative communication; and (iii) pro-active engagement.

15.4. Additional conventional surveys and enhanced data collection proposals

One of the major problems encountered in this project and indeed for planning in general in South Africa relates to the availability of data that is up to date, provides regular time series data and is available at a scale which is useful for planning on a local level. Even where the data is available at ward level the issue of frequent changes of ward boundaries is encountered. Within this framework and taking due cognisance of the advanced data collection and analysis approaches outlined above, a range of recommendations is made here to enhance data collection to improve evidence-based planning that will also enable improved monitoring and evaluation of well-being and its many inter-related components and indicators. The recommendations are that:

1. SACN support and access funding to enable all metros and large cities to undertake surveys similar to those of GCRO and to establish a capability to undertake the surveys and analyse the data on a regular basis through structures such as "Urban Observatories" or establish a working relationship to this end with universities or other research institutions.

2. StatsSA be requested to:

    a. Calculate and make freely available the SAMPI at a sub-place or ward level.

    b. Calculate a Longevity indicator – considered to be a key component or determinant of well-being – at a sub-place or ward level. The limitation one suspects at this stage is the administrative scale/ unit at which births and deaths information is currently recorded. Known death rate data has only been published at magisterial district level for South Africa.

    c. Include additional questions in the next census that can be used to track well-being components based on questions generated by SACN research. This may include questions related to where people work as well as selected questions on life satisfaction, access to facilities and the quality of the environment.

    d. In addition to the General Household Survey, a 'mini-census' be conducted in all metros or fast growing Secondary Cities between Census periods (that is every five years) and that these survey questions are aligned to the main census to enable monitoring of the same indicators across a sustained period. Alternatively, that StatSA look into a process or method to

undertake continuous updates of the census data between the 10-yearly censuses. The sampling approach should be structured to ensure data validity at least at a sub-place level. Such a survey will address one of the key issues encountered by the planning profession as one moves further away in time from the last census period, namely that of inaccurate and outdated information. Between census periods most planners are reliant on private organisations that have developed predictive models and techniques to provide updated information useful for the purpose of forward planning. This data is then only available to the larger cities or organisations that can pay for the data.

e. Expand household survey sample sizes in the cities and structure the surveys in such a way that the data can be used with confidence at a sub-place or ward level.

[It needs to be reiterated that alignment of key questions across different surveys is cardinal to ensure consistent tracking or monitoring of change.]

3. The final recommendation relates to how and what administrative data is recorded and captured in future to improve its usefulness to planners and other departments. Discussions should be held with selected national departments who maintain large citizen-related databases, including SASSA, Home Affairs, the Departments of Education and Health, to request that they at a minimum record the home addresses of all clients and transactions. For example, neither the Department of Health nor the Department of Education maintain an electronic database of users linked to their home addresses. Thus, it is impossible to track which people use a specific clinic or to link school pass rates back to where pupils live. Matric pass rates are only recorded per school and it has not yet been possible to obtain this data set at a spatial level. While Home Affairs has a record of people's current address and place of birth, the place of death is not related to the place of residence. Deaths are recorded based on the magisterial district or local municipal in which the event occurred; that is where the hospital or medical practice is located. Likewise, it is also only through a laborious process of linking identity numbers that an official in the Department of Social Development has been able to geo-code the grant data.

While these suggestions are not exhaustive it can be seen that improvements in how administrative data is recorded, more incremental census-based processes and alternative data sources (from the Internet for example) can contribute greatly to a better understanding of certain phenomena. That is, if we know what it is that we want to achieve and the most appropriate methods of measuring it has been identified to inform the processes of obtaining the data.

16. CONCLUSION

In conclusion, this study has reviewed the key literature on well-being and highlighted the main spatial determinants before proposing a framework for the measurement and evaluation of well-being in cities over time. While it has been possible to map some of the components in a selected case study area of Gauteng this is not possible for all cities, nor is it possible to evaluate change over more than four time periods or even to ensure that the analysis is recent. The latest GCRO data is for 2015 while the StatsSA Census data is now almost seven years old. In addition, some key variables are either not available or only surveyed or usable at a city or provincial scale making it ineffective to monitor changes in indicators of well-being or any other factors for that matter at a sub-city scale. To improve the chances of being able to effectively monitor and evaluate changes in key urban developmental indicators in future, recommendations have been made with regard to alternative research options and supplementary survey approaches that could be considered.

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ANNEXURE A: Available potential data sources

Domain	Indicators	GCRO proxy 2009, 2013 & 2012 Ward	StatsSA proxy 2001 & 2011 EA & Ward	CSIR Jhb-2011 Tshwane – 2014 Hexagons-20ha
A. BASIC HUMAN NEEDS	A1. Basic services	1.4. Main water source (6)	Household services	
	A2. Basic health care	11.2. Why are you not using public health facilities? (4)		Accessibility analysis
	A3. Nutrition	3.2. Hunger (15) 5.7 Ever skipped a meal? (Yes) 5.8. Not enough money to feed the children? (Yes)		
	A4. Basic economic means	12.8. Total household income per month by all members? 12.7. Any member receiving social grand? (Yes)	-Unemployment -Annual household income	
	A5. Basic education	12.1. Highest level of education?	-Years of schooling -School attendance	
	A6. Personal safety	1.29. Satisfied with street lights? 3.2. Crime 4.13.1 Walking/cycling problem? Is it crime? 9.8 Through 9.11. Personal safety questions		
	A7. Shelter	1.3. Type of tenure 12.4 How many people in the house?	-Dwelling type - No. of people/household	
B. IMPROVED QUALITY OF LIFE	B1. Formal employment	Which of the following bring money in the household (12.9/12.10/12/11/12/12)		
	B2. Access to better education (Secondary &ECD)	1.30. Satisfied with educational services?		
	B3. Access to health	11.3. Medical insurance cover?		

	B4. Mobility & travel time/cost to work	4.1.1. Trip that you make most often (1&2) 4.1.2. Walking time to public transport point? 4.16.1. Household expenditure on transport/month?		
	B10. Access to open space & sport	3.11. Visited botanical garden, park or any open spaces?		
	B8. Social interaction & connection	6.4. Ever you attended any of the following community related meetings? (1-7)		
C. CITY LIVEABILITY	C5. Corruption	3.2. Biggest problem in your community?(No. of people who said corruption)		
	C2. Tolerance & inclusion	6.24. Gay & lesbians deserve equal rights with all other South Africans? 6.29. Homosexuality is against the values of my community? 6.33. Acceptable to be violent against gays & lesbian?		
	C6. Social mobility	2.9. Previous dwelling type?		
	C7. Choice of housing opportunity	2.9. Previous dwelling type?		
	C1. Local city governance efficiency	6.7 How satisfied are you with the local government?		
D. LIFE SATISFACTION	D1. Trust in national government	6.2. Why do you not plan to vote? (6) 6.5&6.6. How satisfied are you with the provincial & national government?		
	D2. Social cohesion	10.1. Have you participated in these activities? (any 1-19)		

	D3. Happiness?	7.50. How satisfied are you with life as a whole?		

ANNEXURE B: Potential databases for sourcing spatial determinant indicators

Database	Scale	Main indicators (Groups)	Years & Frequency	Comments
1. Stats SA	EA level	Quality of life Demographics Basic services Income South African Multidimensional Poverty Index (SAMPI)	Census 1996, 2001 & 2011 SAMPI (2001 & 2011)	"2011 Census at ward level – not so good" (Michael Noble) For SAMPI – The multidimensional poverty dataset is not available, therefore, we need to derive the MPI indicators and the process of doing this is not very clear in the Stats SA document
2. Household Survey	Municipal level	Demographic Basic services	Annually since 2002	The frequency at which the surveys are provided can be advantageous in monitoring the country's progress but the scale (municipal scale) associated with the surveys is a drawback
3. NIDS	National	Inequality Employment Health Wealth Poverty	2008, 2010, 2012 & 2014 Biennially	Not available at a finer level, i.e. EA
4. SASAS	EA level	Democracy and governance Education Personal wellbeing index Crime and safety Protest action Household characteristics Intergroup relations Poverty Crime and safety Views on restitution/compensation Income variables (Personal and household)	Annually since 2003	Although SASAS provides 'frequent' surveys at a fine level (EA), the sample size is considered too small (sample size of 500 EAs)

5. AfroBarometer	National	Public attitudes main focus: ➢ Governance ➢ Democracy ➢ Economic conditions	Annually since 1999 Latest available survey (2015)	Not available at a finer level, i.e. EA
6. GCRO	Ward level	Global life satisfaction Family Community Health Dwelling Infrastructure Connectivity Work Security Socio-political attitudes	2009, 2011, 2013 & 2015 Conducted biennially	"Not robust at ward level" (Michael Noble)
7. LSM	EA level	Groups people according to their living standards. Variables used: Degree of urbanisation Access to services Ownership of assets and major appliances	Available to the CSIR (2013)	Can be used as a proxy for well-being at a small area level