Impacts of new buildings on urban liveability: a socio-economic study on Pretoria, South Africa

by

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Declaration

I, Alissa Agneta Terblanche, declare that this dissertation, which I hereby submit for the degree MSc. Geography at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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Abstract

Urban liveability is a perception-driven concept focussed on the connection between people and their urban environment. This study considers whether new construction in urban areas has a positive impact on the socio-economic aspects of liveability – specifically within the developing African setting of Pretoria, South Africa. A questionnaire was distributed to a random sample of 299 respondents from a variety of areas and income classes who live and/or work in Pretoria. A qualitative analysis was also conducted on the opinions of where and which type of construction would be most beneficial or which other solutions could be considered in lieu of or in conjunction with new construction. The study found that new construction is perceived to have a positive impact on socio-economic concerns overall as well as individual concerns including housing, unemployment, access to health and education, service provision and transport and accessibility.

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1 Introduction

Urban liveability focusses on the people living in the city and the connections between them and their urban environment. These relationships indicate whether the population is satisfied with and by their city not only physically, but also psychologically. In addition to being a physical entity, the concept of “urban” is also a quality based on subjective opinions and the urban milieu. It is important to keep in mind that different individual interpretations of the urban environment play a role in the context of the overall urban population (Pacione 2009).

Liveability should be a goal for the urban elite and slum dwellers alike. This is the only way to provide a community for all citizens that can compete and connect at a global level (Evans 2002). However, this goal could prove hard to not only reach, but even define. Urban liveability is a relative term with no objective definition(Balsas 2004). Its definition depends on the purpose of the investigation, where and when it is conducted, and even the individual person conducting the investigation (Rushton 1979). Therefore, urban liveability cannot be considered inherent to an urban area, but greatly dependent on behaviours and interactions of individuals. Because of this partiality, research on the subject of urban liveability needs both objective and subjective information alike. The investigation into the quality of urban environments usually results from secondary data such as census data in combination with other primary surveys and personal opinions. This gives an indication regarding the quality of life of the citizens and the distribution thereof (Pacione 2009).

Urban liveability can encompass a broad assortment of topics ranging from physical to environmental, social and economic. South Africa is a country plagued by multiple socio-economic concerns. Therefore, when considering the time and space setting of the research to be conducted, it is logical to narrow this down to the socio-economic information (City of Tshwane 2017). For communities to be stable, economic, and social progress should be well balanced. However, this balance is delicate and not easy to achieve, mainly because not all economic development information is quantifiable. For example, socio-demographic aspects like job availability, public services and accessibility have an influence and may be defined more objectively than the values, opinions and behaviours that play an equal role in shaping the development further (Majerová 2015). This shows an overlap in urban liveability as a construct with socio-economic concerns like housing, service provision and mobility (Evans 2002). Therefore, this study aims to specifically consider the socio-economic aspects of urban liveability.

Because liveability is also dependent on a specific time and place, it therefore depends on the city as an organism. Shifts in the socio-demography of an urban region are major future-shaping phenomena that influence and are influenced by a

city itself (Carter, Walters 2013). Acknowledging this and taking into account that there is a global, national and provincial trend of urbanisation due to natural population growth as well as rural-urban migration (Pauleit, et al., 2005), urban changes are to be anticipated and understood as accurately as possible. These changes and the preparations thereof have an inevitable impact on new buildings that are required and constructed in urban areas (Statistics South Africa, 2014). It is therefore necessary to question whether there is unity between new construction that is planned and executed and the perceived urban liveability concerns.

The outcome of this study aims to show that personal opinions of citizens and secondary socio-economic concerns are integral to liveability as a concept, and should therefore be considered in planning within the city. It can also help to understand if current attempts to improve liveability and new construction undertakings are actually seen as beneficial in the perception of the citizens of the city. Lastly, it could enable government, municipalities, private companies, non-profit organisations and foreign aid to have a better grasp on socio-economic concerns, urban liveability and/or new construction within South Africa and Pretoria.

2 Literature review

Urban geography is of importance because it provides insight into the living environments and spaces of the global human population. Urban phenomena are however complex by nature. For this reason, the scope of the investigation and study needs to be narrowed on a Spatio-temporal level as well as scope of content (Pacione 2009). This study aims to combine certain aspects of the urban and built environment with human and social geography. Because the study is focussed on Pretoria, the administrative and ultimate capital of South Africa, it also inevitably touches on African and third world urbanisation and social issues (Pacione 2009). The literature review covers existing information on the subject and closely linked concepts. Because the subject under investigation covers the point of intersection amongst a variety of study-areas, it is necessary to consider literature in each of these areas. The literature review is organised by construct, and attempts to flow in a logical sequence from one related topic to the next. The categories are as follows:

- Urban liveability
- Urban structures and urban growth
- New buildings and socio-economic impacts
- Socio-economic concerns
- Context within time and space
- Perception-based research

2.1 Urban liveability

Urban liveability considers how people in the city experience and connect with their urban environment. This implies that the satisfaction of the population should be at both a physical and psychological level. Thus, different individuals and groups of individuals of urban inhabitants within the same urban environment may give and take a different context to the same urban experiences (Pacione 2009). Because urban liveability as a concept is influenced by subjective opinions, it becomes difficult to define it without creating further context. The context is defined by the specifics of an investigation as well as the time and location of such an investigation. A repeated study in a different location or different time could yield different results. It is important to remember that urban liveability cannot be considered inherent to an urban area, and research on the subject of urban liveability needs to not only clearly define the context, but also understand the importance of a combination of objective and subjective information (Pacione 2009).

Similar to most urban geography studies, the focus can be on an analysis of the city itself, or a comparison between different urban areas (Pacione 2009, Brown, Dixon 2014). When considering a study within a specific area alone, as this study aims to

do, there is a linkage between the built environment of the city and how it is experienced by the society. By this description, urban liveability is influenced by physical as well as socio-cultural impacts. The physical impacts include the landscape of the city and the built environment, the climate, pollution, etc (Pacione 2009). Socio-cultural aspects are concerned with aspects like legibility, accessibility and crowding (Pacione 2009, Harvey, Aultman-Hall 2016).

Whilst it is the main drive for most urban areas, economic success and technology will not necessarily solve the current issues with liveability. It is true that urban areas create wealth and resources for infrastructure, but connecting these economic benefits to the area's liveability is more difficult (Evans 2002). Besides physical limitations of actual space available for development in an urban area, there are also social considerations – mainly based on the class gap in civilisation. Exclusive real estate and infrastructure that is marketable with commercial and corporate clients put less profitable options like parks and low income housing further back on the priority-list (Evans 2002). The built environment of a city is having an impact on and being impacted by social constructs within the city's population. Therefore, even urban liveability can be unevenly distributed within the same city.

Urban growth does play a major part in the necessity and urgency for considerations in urban liveability, but it is not the only factor to be considered. This is reinforced by the fact that homelessness is not only caused by lack of physical structures, but also personal and societal structural factors resulting in social exclusion (Choe, Roberts 2011). Personal factors like a breakdown in support from social structures, families, friendships and communities are supplemented by the lack of or unaffordability of physical buildings (Pacione 2009, Choe, Roberts 2011). These concepts deal with the urban area on a more personal level. Development and the planning thereof often does not take the personal and more abstract experiences of the inhabitants into account. For example, "understandability" within an urban environment refers to how well people understand the way their city is regulated, managed and developed further (Leach, Lee et al. 2017).

In most developed countries the majority of socio-cultural or liveability studies focus on how a city can be improved (Marsal-Llacuna, Colomer-Llinàs et al. 2015) . On the other hand, within poorer third world cities, socio-cultural aspects not only focus on improvement, but also entail how existing social concerns are addressed and mitigated or alleviated (Saitluanga 2014). The economies of developing cities have become increasingly unliveable in their reach for a global economy and improved cultural activity (Freidberg 2001). This is due to participation at a global scale and attempts to keep up with international improvements in liveability prior to correction of existing concerns in liveability. The larger developing cities are already linked to a global network of economies in a productivity and financial sense, but as a

habitat, the city often continues to fail the actual citizens (Evans 2002). Thus, even a city that has proven to be successful economically or objectively can be negatively experienced by the people living and working in the city.

Studies have been conducted on liveability in first world countries (van Kamp, Leidelmeijer et al. 2003, Balsas 2004, Wang, Su et al. 2011, Hankins, Powers 2009, Marsal-Llacuna et al. 2015), but third world cities and African cities specifically have individual challenges (Wang et al. 2011, Silva-Ochoa 2009, Pillay 2006, Bigio, Dahiya 2004, Choe, Roberts 2011, Saitluanga 2014) . African cities have changed in liveability since the 1960's (Pacione 2009). Many African countries have only achieved independence fairly recently and have had to attempt to catch up with progress in Western cities whilst simultaneously learning how to manage existing cities. Apart from this, the large African cities and subsequently even smaller cities have continued to expand more rapidly than their western counterparts – specifically through and due to rural-urban migration (United Nations 1995, United Nations 2002). With such rapid expansion there is a mismatch between urban growth and economic growth, and as a result services and infrastructure – including the need for roads, water provision, schools, housing and hospitals – also lag behind. Where the provision seems to be keeping up, an uneven distribution of such services is often shown between the small elite and the growing low-income population (Beukes, Vanderschuren et al. 2011). The uneven distribution of services further leads to difficulties with the economy, limited industrialisation after independence, difficulties with jobs and the privatisation of public entities (Pacione 2009). This alludes to the primary reason that some regions within the same urban area are more popular and economically successful than others – because of proximity to amenities, accessibility, and attractiveness of buildings and open spaces. These unique African problems with liveability have been primarily addressed through existing concepts, for example zoning and regulations (Mubangizi, Mubangizi 2005). In cases where mixing of residential and commercial buildings is not possible, liveability is addressed through mass transit which should be of a good quality in order to serve densely populated areas to more commercial areas (Casey-Lefkowitz 1998). All these solutions are based on sound principles, but have additional unintended consequences. For example, focussing on mass transit and the quality thereof is expected to result in more liveable cities, and is applicable even in an African and developing context, however it seems that urban sprawl will be unintentionally encouraged.

So while solutions like mass transit and consequences like urban sprawl seem to be easily handled, the personal and subjective part of liveability should not be forgotten. It once again makes reference to the fact that the regional or city-wide plans for development (for example through zoning) should not be limited to professionals in the planning and legal departments. The people of the area should have access to answers for any questions they may have (Elliott 2012). The socio-

economic concerns of the area should not be kept separate from urban development decisions both in provision of buildings and infrastructure, as well as the way such provision is perceived by the society.

2.2 Urban structures and urban growth

Urban geography is concerned with the socio-spatial differences and resemblances within and between different cities and towns. While it can be based on spatial distribution and linkages between urban spaces, it can also – as in this case – be based on the study of the internal structure of the city (Pacione 2009). The internal structure of the city is shaped by the landscape of the urban environment with its people, buildings and surroundings.

The structure of the city is usually based on, theories, legislation and the way it originated (Pacione 2009). The structure is then further moulded by physical and social considerations and restraints. As a starting point, one can consider theoretical models of cities. Based on White's model of a 21st century city, cities can be expected to follow Burgess's basic sectoral model, while taking trends into account. The zones that can be expected within a city include (White 1987):

- The core
- Stagnation zones
- Pockets of poverty and minorities
- Elite enclaves
- Diffused middle class
- Industrial anchors
- Epicentres and corridors

Zoning, as a tool to guide urban structures was originally intended to separate the uses of different buildings. This offers a predictable process that follows the expectations of theoretical models. However, as the process of zoning progressed, more detailed and prescriptive conditions were set out. The problem encountered with this approach was that cities looked more towards completing a checklist rather than looking at actual impacts of specific buildings in specific places. Such regulatory systems in a city have been designed to minimise discretion, but in the process it also limits the ability of the system to adapt to changes within the market, the city, and even the world (Elliott 2012). This removes the subjective component that should form part of decision making regarding urban areas and growth.

Zoning plans and developmental regulations remain fairly static in the sense that it takes years to amend (Elliott 2012). Unfortunately, it is not easy to predict that many assumptions and unknowns for it to remain applicable until the next revision. On the other hand, an opportunistic decision at one point could have further

consequences later. For example, if further development of housing is centred around a large manufacturing plant, closing of the plant at some point in future will leave a housing development at what seems to be a very strange location (Elliott 2012).

Notwithstanding some limitations imposed by the zoning systems of a city, change in an urban setting is not only inevitable, but also necessary. Urban design should meet the aspirations of the people and serve to the health of the planet. With this in mind, cities should be seen as constantly changing entities with a unique landscape of physical and social interactions. This also provides the value and identity associated with a specific place (Brown, Dixon 2014).

While different zones and realms in an urban area will still exist, one can keep in mind that these zones and realms have a certain amount of interaction. The interactions between zones on a daily basis include movement commonly referred to as commuting. Different forms of commuting can be investigated – including movement within the central area, inward commuting (to business centres), reverse commuting (from business centres), lateral movement within a zone itself, and cross commuting (Plane 1981). All of these are necessary to enable accessibility across different areas within one city. A functionally integrated urban area is encouraged by accessibility of workplaces to citizens (Plane 1981). This means that the closer different zones and realms can be established to one another, the better. While it is preferable to have the home and workplace near to each other, the development of motorised transportation (public and private) such as rail, trams and cars have allowed land specialisation even though these are further apart in distance (Pacione 2009). This has assisted in separating the need for proximity as the most important aspect of accessibility, as these areas can be separated but can remain mutually accessible (Pacione 2009).

There are pros and cons to all the different approaches of shaping a settlement through urban planning and design. It has been found that, often, the approach selected by a city is actually not necessarily the best approach, but seems to be linked to the personal preferences of decision-makers regarding buildings, cities and spaces and even an individual's acceptance of systems and value of relationships (Brown, Dixon 2014). Urban planners seem to find it easier to contextualise with their instinct and preferences rather than base their decisions on realities and empirical values (Brown, Dixon 2014). The difficulty is in ensuring that such decisions not only take into account the instinct and preferences of systems (such as zoning), individuals (such as the planners) and the collective (such as the community and society) but some combination of all of these.

However, it is not possible to take all considerations into account when making decisions. But, urban design should address changes to the urban structure

including social aspects during the growth of the city like security, privacy, identity, clarity and social interaction (Zeisel 1975).

Urban areas change for a variety of reasons (Brown, Dixon 2014), most notably (Pacione 2009):

- Increase in population in the area – urban growth
- Increase in proportion of population in the area – urbanisation, and
- Change in the behaviour of society – urbanism

Changes in population numbers and distribution of such as well as changes in the needs of the society is a natural and continuous occurrence, therefore change in urban areas can be expected to be a constant process. As time progresses, the urban area will adapt to new circumstances. Urban change usually has three principle outcomes (Pacione 2009):

- Local, regional, national and global changes in urban systems
- Urbanism and the spread thereof
- Changes in urban places, land-use, built environment and the social ecology thereof

This study looks at new buildings and for this purpose the focus would mostly be on a combination of factors within the third outcome. Cities are shaped by political, market, societal and geo-spatial events and activities (Jacobs 2016). A thorough understanding of urban development should therefore be trans-disciplinary (Jacobs 2016). This view once again reiterates the importance of understanding that no aspect of urban change and development can be seen in isolation, and that a variety of factors influence and impact each other – which is equally understood for urban liveability. For example, it is generally understood that different realms within an urban area are shaped by physical factors like the terrain (such as topography and water) and size of the area. These factors are commonly observed in cities that follow the contour of a river, settle between mountains or have more high-rise buildings where space is limited. In addition to these physical factors, socio-economic aspects including the amount of economic activity and accessibility (Jacobs 2016) similarly influence the structures and growth patterns of cities – once again tying physical urban structures to other factors that form part of urban liveability.

This leads to the shaping of cities and their communities through not only the existing environment, but also the constant of change. These changes include changes that necessitate or are consequential to new construction.

2.3 New construction and socio-economic impacts

There is always room for preservation and revitalisation within communities. There are many areas within a city in need of rehabilitation in order to provide for a better

quality of life (Casey-Lefkowitz 1998). If rehabilitation has appropriate scenarios, so too should there be an appropriate scenario for new construction.

In Africa, the average annual rate of change of urban population is very high. The predicted rate of change from 2020 - 2025 is 3.34% (United Nations 2002). And while this is lower than the measured 4.38% from 1990 - 1995, it is still much higher than the North American growth rates of 0.99% and 1.29% in the same time periods (United Nations 1995, United Nations 2002) . It is expected that existing buildings would not be able to cope with such an increase in population, therefore despite any mention of general urban changes; new construction can be anticipated to be a necessity.

The determination of new buildings depends on several decision-makers. Current land use, zoning, and the general pace and scale of development is determined by regulation and public authorities (Pacione 2009). Developers also play a big role as they prefer for new buildings to be cheap or profitable and easy (Turok 2016). At the far end of the spectrum, building owners consider aspects like cost, safety and proximity to amenities (Casey-Lefkowitz 1998). Taking this into account one can see that new buildings tend to favour the needs of those with a contribution to offer in these decision-making sectors whilst a significant portion of the population remains voiceless in the decision-making.

Even though a portion of the population has no say in where and what new buildings are developed, the development of real estate has many impacts on the surrounding properties and even the entire city. Real estate and construction are big industries with the power to influence local and regional economies however, they are driven by profitability. Development is often speculative and can even be undertaken with the assumption that the market will arrive later. This results in preference being given to the real estate and construction industry with the money to influence what should be built and where (Elliott 2012).

Therefore, new buildings are driven by legislation, government, municipal decision makers' vision, real estate developer and contractor appetite and profitability. Notably absent is the voice of the actual community that live with and use the new buildings. Their needs and socio-economic concerns are not explicitly taken into account (Pacione 2009, Turok 2016, Saitluanga 2014).

In addition to that, while many cities have regional development plans regarding land use, zoning, and social and physical infrastructure, the inflexibility of these plans prevent a move towards sustainability due to its inability to rapidly respond to changes (Choe, Roberts 2011).

The needs and socio-economic concerns of a city in a developing and African country are also vastly different from those in the majority of cities in developing countries. Industrialisation in Europe took 200 years to reach its peak, and during this period the economic and city structures had time to gradually adapt and change (Marsal-Llacuna et al. 2015). When considering developing countries on the other hand, industrialism and often political independence only started after World War II which resulted in cities and economies growing at an accelerated pace. The structures of the cities are changing with this increased urban growth. It is expected that cities could become economically, socially, politically and environmentally dysfunctional if better urban geographies are not created and cities do not adapt to a more dynamic form (Choe, Roberts 2011). While the studies cited focussed mostly on Asian countries, the same applies to developmental African countries as well (Suzuki, Dastur et al. 2010, Teo 2014, Takahashi, Daniere 1999).

Some comparisons can be drawn with cities in India where there are very large metropolitan areas as well as rapid urbanisation. While they have succeeded in fairly good wealth-creation in urban areas, they have found the same areas are still struggling with economic growth because of the lack of services and infrastructure (Choe, Roberts 2011). As urbanisation leading to higher densities of people and buildings are inevitable, infrastructure, job-creation and better urban productivity should be a priority (Choe, Roberts 2011). It can therefore, be deduced that the higher the population and building footprint in an area, the more effort should be put into other aspects of socio-economic development to ensure that quality of life and liveability is not sacrificed.

It is important to understand that the society of a city should have a voice in determining urban growth, specifically in the form of new buildings. It is equally as important to understand that socio-economic concerns of an area and new urban growth seem to have a mutual impact on one another, whether positive or negative. The new buildings are necessary to keep up with urban growth and urban changes, but also result in urban sprawl and/or higher densities of buildings and people.

One of the main problems with higher densities of buildings and people in urban areas is exacerbated in developing countries. Domestic environment problems in third world cities include water provision, sanitation, indoor pollution and overcrowding. Overcrowding in combination with other factors like lack of sanitation bears a high risk of associated health issues (Pacione 2009, Bigio, Dahiya 2004).

Another concern caused by the high concentration of people in urban areas is a lowered quality of life – specifically in terms of housing, transport, hygiene and pollution. For this reason, it is necessary to look at the relationship between urban dwellers and their environment while also taking the built environment into consideration (Evans 2002). From this, it seems that population and building

densities by themselves are not a socio-economic concern, but they do increase the occurrence of other issues. The occurrence of problems and even benefits are not always with population or building densities themselves, but with their unintended possible consequences. For example, the addition of new buildings will increase the density, which could be seen as problematic. However, new construction and urban growth is sometimes necessary to assist in addressing socio-economic concerns.

2.4 Socio-economic concerns

People living in an urban environment interact with their environment and one another through the exchange of information and resources, therefore urban communities become a source of identity for the inhabitants (Evans 2002). An urban ecological structure develops from the superimposition of different components. This includes both physical and social spaces. Social spaces are influenced by aspects like the ethnicity, family and economic status of inhabitants and users of the space (Murdie 1969). In other words, communities within urban areas develop through differences in social rank and economic status, urbanisation and ethnic status or division based on ethnicities (Pacione 2009).

Cities should aim to reach a state of sustainability – the needs of the current generation should be met without compromising the ability of future generations to meet their needs (World Commission on Sustainable Development 1987). Sustainability should not only be focused on natural resources, but also social and economic justice. Within urban areas, this further expands to physical and political sustainability as well. Sustainability is a concept that is trans-frontier and intergenerational (Pacione 2009). However, similar to the discussion in section 2.3 (new construction) the socio-economic structure of a city is not seen in the same way by large corporations and poor citizens alike. Enterprises and the elite use the city mostly as a platform for inter and transnational trading of such information and resources (Evans 2002, Elliott 2012). Because their quality of life does not depend on the community as much, the communities do not determine the success and power of the city. This shows a dual city in both the built environment and personal service provision – which becomes clear when considering the example of exclusive gated communities with fewer socio-economic issues in comparison with informal slums with limited infrastructure and multiple socio-economic concerns (Evans 2002). Still, the relevance of sustainability in cities today is a topic on various forums. The attraction to continue to invest in the socio-economic well-being of an area is somewhat driven by responsibility towards the socio-economic components of sustainability.

Sometimes the investment in improvement does not only come from within the area itself but can be driven from international and transnational corporations and NGO's (Wigle 2008, Jacobs 2016). An example of such international and transnational driven improvements to socio-economic conditions is the eight Millennium Development Goals selected by the United Nations in conjunction with world leaders'. The goals were developed in the early 2000's and are aimed at fighting poverty and encouraging development in socio-economic, political and environmental categories before 2015 (United Nations 2015a). After 2015, the eight MDG's were followed up with and replaced by the 17 Sustainable Development Goals and targets for 2030. The current 17 goals can be summarised as in Table 1 (United Nations 2015b):

Table 1: United Nations Sustainable Development Goals

Goal Number	Goal details
1.	Ending poverty
2.	Ending hunger as well as focussing on food security, nutrition and the sustainability of agriculture
3.	Ensuring well-being and healthy living
4.	Ensuring education that is inclusive, of good quality and extends to learning opportunities that are lifelong
5.	Ensuring equality and empowerment for women
6.	Ensuring availability and sustainability of water and sanitation
7.	Ensuring affordability, sustainability and reliability of access to energy
8.	Promoting economic growth that is sustainable and inclusive with decent employment
9.	Building reliable infrastructure with inclusive, sustainable and innovative industrialisation.
10.	Reducing inter- and intra-country inequality
11.	Ensuring safety, resilience and sustainability in cities and settlements
12.	Ensuring sustainability in production and consumption
13.	Taking action against climate change as a matter of urgency
14.	Conserving seas, oceans and marine areas
15.	Protecting and restoring terrestrial ecosystems and forests while also taking actions against desertification, land degradation and biodiversity loss
16.	Promoting access to justice and peaceful inclusive societies with accountability and inclusivity
17.	Strengthening global partnerships in implementing sustainable development

While not all these goals are applicable to socio-economic concerns within an urban context, it is evident here too that there is a strong emphasis on social problems similar to the ones being investigated in this study. Goal 9 is explicitly focused on

the building of infrastructure and ensuring that this is inclusive and sustainable, while goal 11 mentions cities and human settlements and the importance of resilience and sustainability in these areas. Additionally Goals 4 and 6 - 8 all mention specific socio-economic conditions investigated as part of this study as well (United Nations 2015b).

Similarly, it has been found that access to resources, housing, schools, policing and opportunities play a role in marginalising an area and reinforcing a gap between the rich and the poor. This is usually a geographical manifestation of a larger socio-economic structural concern (Fainstein, Fainstein 2009).

Because quality of life and socio-economic concerns tend to be very broad principles (Evans 2002, Mercer 2017), narrowing these concerns down to the aspects that require the most attention is not easy, but it is necessary. The inspection of social and quality of life concerns needs to be done within their specific contexts. For example, in Mexico it has been found that the provision of public goods at a municipal level depends on the region size (in terms of population and area), education and literacy levels, health and housing services provision, but also the capacity (budget constraints) and thickness (level of involvement and corruption) of the municipal institution (Silva-Ochoa 2009). Similar criteria might seem either redundant or insufficient in another context.

In this study, the socio-economic aspects that were selected for further examination had to adhere to criteria that are specific and relevant to it. The criteria should:

- All be considered relevant to a South-African urban context
- Have expected impacts on the liveability of citizens,
- Be expected to be impacted by new construction.

The socio-economic concerns that adhered to the criteria, and were subsequently selected to form part of the study are as follows:

- Housing
- Unemployment
- Proximity to health and education
- Services and infrastructure
- Transport and accessibility

Each of these has applicable literature that should also be individually examined.

2.4.1 Housing

The availability of shelter is considered to be a basic human need (Pacione 2009). Residential buildings are used to provide for such needs. There is no generally accepted definition of what a decent home, or proper living arrangements entails.

This depends on the neighbourhood, privacy, services, facilities, space and even society (Pacione 2009). All of these are influenced in turn by the placement of buildings within an urban environment.

When considering housing and the economic and social outcomes achieved by providing these buildings, it has been indicated that social support, neighbourhood experiences, language and resident identity determine whether people connect with their neighbourhood (Walker 2016). This means that housing, not only satisfies a physical need, but also a social need to belong. Bearing in mind these socio-economic linkages, housing becomes not only a shelter but also an asset that should be recognised for low-income families as well. While informal settlements tend to be located on the urban periphery, thereby minimising the value, it can still be a property asset. In Mexico, for example, it is argued that the “right to shelter” is not descriptive enough, as it should encompass linkages between shelter, livelihoods, and the rest of the city (Wigle 2008). With these additional considerations in the approach to housing, provision of adequate housing for all becomes more difficult.

Third world populations in particular with their broad range of classes, has housing at various levels that include public housing and private housing (built with conventional methods) but also squatter settlements, slums and townships (World Commission on Sustainable Development 1987). The latter groups of housing are often a social concern for the area further fuelled by higher populations. Rapid urbanisation should not necessarily lead to the formation of slums. Unfortunately the divide between economic growth of the city and its citizens results in poorer populations in more affluent cities. This situation combined with inadequate planning and lack of capacity to cope with the diverse infrastructural demands of society makes the housing situation difficult to control. It is important that the linkage between economic development, urban growth and housing be recognised (Giok 2007).

Housing projects are often at risk of producing inefficient, exclusive and environmentally damaging outcomes. The purpose of housing should be for more than simply constructing additional housing. The approach should include opportunity creation for more productive people. With such an approach urban areas could be more efficient for economic activity, investment and jobs (Turok 2016). This reiterates the connectedness of housing provision with other socio-economic concerns and programmes.

The cost of housing is influenced by many aspects along its development, including the land itself (in turn influenced by its location), and the methods and materials employed. Restrictions or regulations on any of these could hamper or assist the affordability of housing (Elliott 2012). Current measures for affordability of housing

are crude, and not representative of all social classes. The usual measurement entails using a proportion of household income spent on housing to indicate whether accommodation is affordable (Pacione 2009). Even based on the affordability for different classes, there is a discrepancy in what can be obtained. People of high social status have the means to select houses and neighbourhoods. Poorer households on the other hand are restricted by their social situation. This leads to the development of slums, informal housing and townships in opposition to status areas such as gated communities (Pacione 2009).

In most literature, it seems widely accepted that housing is a socio-economic concern that should be addressed as a necessity. The requirements for what constitutes adequate and affordable housing, however, are not as easy to define and are not only physical in nature. It has also been noted that housing is generally not sufficiently understood and catered for in different income and social classes.

2.4.2 Unemployment

As a major socio-economic concern, the reduction of unemployment is further supported in consideration of the Millennium Development Goals' target for eradicating poverty – employment is considered as one of the main targets (United Nations 2015a). The United Nations further reiterated this in the subsequent publications where Goal 8 of the Sustainable Development Goals for 2030 specifically mentions that employment should be full and productive, comprise of decent work and assist with economic growth that is sustainable, inclusive and sustained (United Nations 2015b). In attempts to address unemployment, cities are becoming increasingly important – specifically through development, diversifying economies, and job creation. It is important to ensure that a city becomes more competitive (nationally and globally) by improving any developmental areas lacking in performance (Choe, Roberts 2011). Access to jobs is known to be limited by general criteria of the individuals and population such as qualifications, skills, and access to capital. Most relevantly, employment is further limited by access to market, and physical access in the area as well (Pacione 2009).

Physical areas that have the capacity to create additional employment include industrial, office and retail space within an urban setting. Spatially, these physical areas can be arranged in several forms (Berry, Simmons et al. 1963). This includes:

- Centres – such as neighbourhoods, communities or regions,
- Ribbons – shopping streets, or industrial space along a highway, or
- Specialised areas (automotive or entertainment districts)

While retail and office space is most often in the form of shopping areas, malls, and office blocks it has an influence on surrounding areas through creation of retail-

intensive streets, and office complexes. Retailing space forms a large part of an urban environment. It creates a consumption environment and sets up an economic centre with the associated further job-creation. Retail and office spaces have the ability to change the form of an urban area based on its availability or lack thereof (Pacione 2009). Regardless of which spatial arrangement is followed in such industrial, retail and office areas, the accessibility should ideally be distributed within reach of all settlement areas in the city.

In developing countries the unemployment issue is further compounded. For example, in Sub-Saharan Africa, the employment-to-population ratio has increased by only 2% from 63% in 1991 to 65% in 2015. It is estimated that this slight improvement has been offset by informal employment and low productivity amongst labour (United Nations 2015a). Apart from the social development concerns, the structure of CBD's in these areas focus on a move to the periphery where cheaper land is available, where land is more accessible and where urban planning is more lenient. This tends to result in urban sprawl and puts pressure on natural resources with economic and social changes. It also tends to change the availability of opportunities such as jobs, housing and service provision (Pacione 2009).

Correspondingly, property development regulations seem to favour the economic development but does so on a larger scale. For example, approval of development of a new shopping centre will be more likely to succeed than having several small neighbourhood shops (Elliott 2012). Unfortunately, the potential of neighbourhood shops at a specific location could have been as successful for economic development over a longer term, but the initial investment costs are too high for segregated developments.

The knock-on effect from employment creation and the spatial placement thereof links with the need for accessible services and other aspects of the urban environment to the people within the city.

2.4.3 Proximity to health and education facilities

Access to and equity of provision of education and health is very important. Addressing either of these in isolation will not be optimal. However, with linkages between the two, a reduction in poverty and unemployment can be sustained (Pillay 2006).

The location of an individual's residence can impact health in terms of the frequency of illness as well as the accessibility of medical treatment (Corburn, Curl et al. 2014). While provision of medical facilities and hospitals are generally of better quality in urban areas than rural areas, the proximity of such facilities in

relation to the poorer areas, slums and informal settlements mean that those who are in the greatest need for health facilities have the worst access to it (World Commission on Sustainable Development 1987). The same can be said for education. While urban areas tend to have superior facilities, the better schools are generally more elite, expensive and harder to gain access to, resulting in areas with lower literacy levels being further away from quality education.

In a city, environment health is shaped by the physical and the built environment. This consists of access to services (including water provision, garbage removal, sanitation etc.), pollution, and lack of green spaces. However, these are not the only influences on urban health, as it has been noted that differences in social environment within the context of status or class also plays a role (Corburn 2015). When considering equity in health provision the idea is not equality (sameness) for all, but rather aiming to ensure that historically marginalised groups have access to services and resources that promote health (Corburn et al. 2014). Therefore, in an effort to improve the accessibility of health and education, the attempt is usually to provide more services and care in more places. While this does address some of the issues and reaches many people, in reality spatial inequities based on race and/or ethnicity are unfortunately still not addressed in such a broad approach (Corburn 2015).

Once again, developing countries need education and health systems to be exaggerated further. As societies develop, the literacy levels and health of the communities improve – resulting in higher life expectancies and better opportunities. Many third-world countries are in a mixed stage of transition, translating to higher life expectancies, and continuing high birth rates. This leaves a high rate of population growth as well as a young population. The size of the youth population increases the need for education provision. In addition, diseases like HIV/Aids are a problem in many third-world cities (Pacione 2009). For example, whilst the absolute numbers of school enrolment in the sub-Saharan area has more than doubled, the area is still facing high poverty levels, rapid growth in young population and subsequently school-age children (United Nations 2015a). This highlights the fact that interventions in health and education are still required.

Education is not only required for children. Goal 4 of the United Nations Sustainable Development Goals for 2030 insists that education should include lifelong learning opportunities. Education should also be of good quality and inclusive to all (United Nations 2015b). This is also preceded by Goal 3 stating that healthy lives and well-being of citizens should be promoted (United Nations 2015b).

Health interventions in an urban area usually focus on bringing certain services and care to a neighbourhood. This means the effort to improve healthcare facilities is either focussed on the people or the place, but rarely on a combination of both

(Corburn 2015). This highlights the need to better understand the importance of integration of the social and spatial aspects of provision of health and education. It is necessary for health interventions to adopt an integrated approach that takes both time and space into account. This allows for the social needs for different population groups within an area to be considered (Corburn 2015) which and ensures a sustainable solution.

2.4.4 Services and infrastructure – including transportation

African cities are expected to grow significantly, but the slow improvement of access to basic services is negatively impacting the quality of life in urban areas (Bigio, Dahiya 2004). In order to assist with economic development in cities there should be a strong focus on physical development and infrastructure. For more developed countries and areas, this is expected to be focussed on health, education and telecommunication infrastructure, while less developed areas will most likely prioritise roads, water and sanitation (Choe, Roberts 2011). Because health and education are addressed in a separate section, the services referred to in this case include:

- Access to water
- Sanitation or sewage systems
- Solid waste disposal
- Energy provision
- Transportation

The World Bank has shown its intent to assist in pursuing more liveable cities by prioritising the creation of better urban environments. They have done several case studies on urban areas, health and resources. Most of these projects focus on service provision aspects (listed above) – either in different urban components or entire urban environments, with only a limited amount of projects considering individual activities in isolation (Bigio, Dahiya 2004).

In developing countries, service provision is often dictated by the level of income. Levels of car ownership for example, are fairly low with only 28% of the population using a private vehicle to get to work. Although the majority of the population make use of public transport or non-motorised transportation, the provision of such facilities remains lacking. This does not seem to be an issue of inadequate legislation and policies, but infrastructure that seems to remain biased towards private vehicle transportation (Beukes et al. 2011). Private vehicles as primary mode of transport favours the more affluent citizens in terms of comfort, while the negatives – traffic gridlocks, poorer air quality, etc. – are experienced by the privileged and poor alike, even if they do not contribute to the cause thereof (Evans 2002). The same situation can be seen in sewage systems and waste removal

programmes not being accessible in poor or slum neighbourhoods. While these areas are sometimes located on cheaper land, close to treatment plants or landfill sites, citizens need to live with the smells and other repercussions of the service provision.

Historically, infrastructure and industrial development has been happening on a supply-side driven process, where costs are kept as low as possible and investment is expected after completion (Takahashi, Daniere 1999). This was done in an attempt to catch up with rapid urbanisation. In Asia, it has been proven that where economies are more market-based, one can assume a demand-driven developmental approach to be more successful (Choe, Roberts 2011). Demand-driven infrastructure development can result in rapid urbanisation actually driving further economic development (Choe, Roberts 2011). On the other hand, where rapid urbanisation can possibly lead to further requirement of services, one can be reminded of the interrelationships between different socio-economic concerns, and even different infrastructure provision aspects. For example, transportation access can be expected to have an impact on traffic, but it also has further positive impacts through the accessibility of other concerns like employment opportunities. These effects are very complex, and difficult to anticipate when only considered in terms of a “cause and effect” approach (Elliott 2012).

Despite difficulties in the repercussions of the extent of service provision, it is acknowledged that basic service provision should be prioritised. From literature, it is also shown that service provision once again tends to be distributed unevenly in terms of geography and between income and social classes.

Goals 6 and 7 of the Sustainable Development Goals of 2030 echo the same sentiment by specifically focussing on the availability and sustainability of provision of water and sanitation as well as the reliability, sustainability and affordability of access to energy respectively (United Nations 2015b).

2.5 Spatio-temporal context

Throughout the research and discussions of all the above concepts within this study, all research and data referenced have been constantly yet unconsciously placed in a specific time and place. For example, mention is made of how cities have changed from a specific time in the past, or how liveability concerns differ between developed and developing countries. It is necessary to highlight the importance of a spatio-temporal nature of urban geography.

Taking place and time into account with urban planning, zoning and regulations has proven to be fairly difficult. For example, in time, would short-term be considered

weeks, months, years or decades? In addition, if there is a difference of opinion between different branches of decision making, which party's opinion is deemed correct? In space, which delineation of boundaries is accepted and for what reason? For one specific study, it could it be based on political boundaries, while another study might find it more beneficial to focus on similarities in the area (Elliott 2012).

Urban realms are shaped by the terrain, the overall size, amount of economic activity, intended accessibility of the realm to the core and inter-accessibility between realms (Vance 1964). Furthermore, urban places are identified based on the size of the population, economic base, and administrative criteria at a local, regional or national level. The functional definitions could extend the urban area to its surrounding area of influence as well (Pacione 2009). Differences in population, environmental factors, technology and social organisation of individual cities and within cities determine the progression and set-up of each specific area (Pacione 2009). While all these factors are not essentially relevant for the same research, it is necessary to be aware of how broad the scope could be.

Urban changes indicate how this space can change over time. The management thereof often places emphasis on how the area's national, regional and local context should be incorporated (Pacione 2009). Therefore, while some urban geographical aspects can be consolidated at a national level, others will differ between regions of the same city.

Distinct urban environments are inherently vastly different. For example, Western cities are striving towards post-industrial or post-modern approaches. This leaves them with deindustrialisation, inner city decline, urban sprawl, traffic congestion and excessive energy usage as challenges. Third world cities on the other hand are still striving to be industrial and modern, and need to focus on over-urbanisation, infrastructural deficiencies, poverty and social polarisation (Pacione 2009). It is to be expected that the same study done on the liveability of a developing city will provide vastly different results when done in a developed city with a world-class economy.

Place and ethnicity have historically been blamed as contributors or causes of socio-economic concerns rather than an expression of symptoms. The solution is generally either to provide a distressed area with assistance and resources, or to deconcentrate the population of the area. It has, however, been found that concentration of poverty could also be an effect as opposed to the cause of the problems. Also, while some households have benefitted from better housing and amenities in a new location, this solution does not apply to all households. The cost of relocation, better relative location of the original neighbourhood or connection with the community in the area are some factors that would suggest why relocation

to a more affluent neighbourhood does not appear to be a solution (Fainstein, Fainstein 2009). From this, we find that suggesting a change in space or in time is not a successful solution to problems experienced in a specific place at a specific time. Interventions to provide a school in an area 20 years from now, while noble, will still not solve the illiteracy of today's children. Nor will moving all people from the slums into another suburb solve the housing or unemployment problem, because you are also removing them from a space within which they identified and built a community.

2.5.1 South Africa

In order to provide some context in time and space, research on cities in the African continent and South Africa specifically should be considered. Africa is the least urbanised of the continents, and also has the most diverse variety of urban forms (Pacione 2009). The diverse variety corresponds to the different indigenous urban traditions and colonial legacies (Pacione 2009). South Africa is considered a semi-periphery country within the global system. This category includes the rest of the BRICS countries (Brazil, Russia, India and China). South Africa is the only African country that is not considered to be within the periphery category (Wallerstein 1974).

In terms of general structure and layout of a city, there are seven types of African cities:

- Indigenous
- Islamic
- Colonial (19th century)
- Dual city
- European city – European in the core and African on the fringe
- Apartheid city
- Hybrid city

It is clear that many South African cities follow these forms – for example, Johannesburg is considered a primarily European city. Nevertheless, because of the fact that South Africa has an indigenous, colonial, European and apartheid background, the majority of African cities are to some extent hybridised (O'Connor 1983). These structures will not be explicitly investigated further, but an example of how it could influence the urban socio-economy is given at the hand of an apartheid city.

The apartheid city generally follows the form of Figure 1.

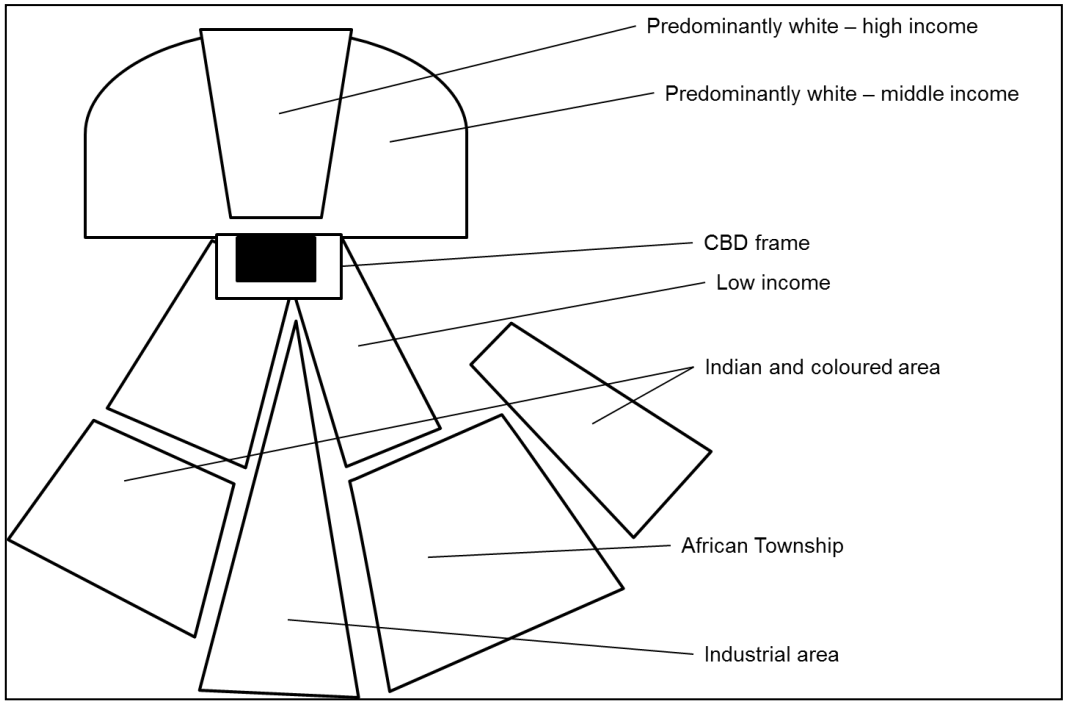

Figure 1: Apartheid city structure
Adapted from (Lemon 1991)

While apartheid was abolished a few decades ago, this is still a relatively short period of time for urban constructs and structures to be changed. It is expected that the typical South African city will still have some apartheid legacy in the structure. Therefore, different sections of the city will respond differently to the same set of variables.

Third world urban structures are historically influenced by colonialism and the legacy thereof (Pacione 2009). Some colonial aspects influencing urban form include (Simon 1992):

- Colonial motives, for example cities developing for agriculture or mining purposes
- Colonial vs. imperial setting up permanent settlements
- Structure of indigenous people distribution where some have been destroyed, some ignored and some segregated
- The role of the ex-colonial elite
- The nature and form of production in the surrounding areas
- The relationship between the colonisers and indigenous people
- The nature of pre-colonial settlements
- The anti-colonial struggle
- The politics pursued in the area
- The extent of urban planning in the area

These colonial aspects also influenced the physical structures of an area, but could further impact the way certain areas are still perceived to this day.

Even when considering residential mobility and neighbourhoods – changes in this aspect can be voluntary or forced. Voluntary movement can be because of a choice to move to an area with better housing, a better neighbourhood or better accessibility. Voluntary movement can also be induced by changes in employment, household and marital status (Pacione 2009). Forced mobility on the other hand was commonplace earlier in South Africa because of colonialism, and then later due to apartheid. This forced specific cultures and races into specific locations. By keeping this in mind, it is understandable that some South-African city zones are still distinguishable as stemming from such division.

Apart from the city's history, African and South-African cities are also influenced by the traditions and lifestyles of its communities (Mubangizi, Mubangizi 2005). For example, many third world urban areas depend on informally organised market-oriented activities like home industries, street economies, construction, domestic services (cooking, gardening, nannies and maids) and micro enterprises (including shoes, metalwork, cars and plumbing) (Friedmann 1992). This creates a construct of employment that is different from that which can be expected in well-established and developed cities. Another example is that the construct of acceptable buildings differs between developed and developing cities – for example, the United States of America (USA) definition to be considered homeless includes residing in traditional housing (housing pertaining to certain cultural groups) or even illegally doubled-up buildings (Goldstein 2011). When looking within a South-African context, such buildings might constitute a fairly acceptable residential building in comparison with some of the shacks and canvas-tent residences found on the peripheries of urban townships.

There are even differences between third world urbanisation and urbanisation in the first world. In third world urbanisation, the social make-up is different, because of lower levels of education, lower life expectancy, greater numbers of people and a more rapid rate of urbanisation. There is a high likelihood of slum areas and marginal employment due to the urbanisation rate exceeding the rate of industrialisation. As expected, many of these differences seem to be socio-economic in nature. On the other hand, the communities of third world cities also tend to be more involved in their urban areas (Pacione 2009). It is possible therefore, even for cities with many socio-economic concerns to be considered more liveable because of the trade-off with the psychological factors of a supportive community.

In South Africa specifically, poverty is still an immense problem compounded by the inequality in distribution of income (Mubangizi, Mubangizi 2005). In addition to that socio-economic concerns such as health (including HIV/Aids), unemployment and low education levels also need attention (Mubangizi, Mubangizi 2005). These are

all social factors compounded by a rapid rate of urbanisation. The percentage of South Africans in urban areas has increased exponentially. Over 40 years up to 1990 there was a 6.1% increase in people living in urban areas which amounted to a total of 52% of the population living in an urban area (United Nations 1995). This was followed by an overall 8.5% increase in the 11 subsequent years to 2001 (United Nations 2002). In 2014 it was indicated that 64% of South Africa's population is urban, signifying an existing annual growth rate of 0.8%. It is anticipated that the total urban population would reach 77% by 2050, with South Africa remaining the most urbanised of all Southern African countries (United Nations 2014).

It should be noted that the South African government, citizens, corporations and NGO's are aware of the prevalent social issues as well as the rate of urbanisation. There are various legislature and welfare programmes that are aimed at alleviating socio-economic problems. These include (Mubangizi, Mubangizi 2005):

- Reconstruction and Development Programme (RDP)
- Growth, Employment and Redistribution (GEAR)
- Extended Public Works Programme (EPW)
- The South African Bill of Rights in the constitution (Act 108 of 1996)
    - Section 24 – Right to an environment not harmful to health and well-being
    - Section 25 – Property rights
    - Section 26 – Access to adequate housing
    - Section 27 (a) and (b) – Access to health and water provision
    - Section 29 – Basic and ongoing education

Despite these interventions, socio-economic concerns remain serious, especially within the fields considered for urban liveability. This is reiterated by the following statistics from a national household survey in 2016 (Statssa 2016):

- Density – The country has a current population of 55.6 million. This gives an average of 46 people per km² not taking urban and rural differences into account. The average household size is 3.3 people per household.
- Housing – 79.2% of the country's population lives in formal housing. Of this, approximately 23.1% is housing subsidised by the government, and only 65.7% are the owners of their homes (whether still being paid off, or fully paid)
- Access to health and education – Disabilities are prevalent in 7.7% of the population. Only 3% of the population have bachelor's degrees, outweighed by the 6% with no schooling. A total of 31% of the population have secondary education, and for the majority (60%) primary school is the highest level of education.
- Services and infrastructure – The bulk of the national population have access to water (83.5%), electricity (90.3%), electricity for cooking (82.7%),

and flush toilets (63.3%) to a sewer system or septic tank. On the other hand, the water and electricity access is not defined to be within the property, 2.4% of the population have no toilets, and only 45.6% have toilets in their houses.

In addition – the national household survey lists the five leading challenges experienced by citizens as (Statssa 2016):

- Water supply
- Unemployment
- Electricity supply and/or cost
- Housing provision
- Violence and crime

As is already known, these statistics could indicate a broad snapshot of liveability, as it combines statistics and objective data but also some experiences of citizens. While this does not give detailed information about the concerns, it does reiterate the fact that liveability challenges seem to be linked to socio-economic concerns. It also does not consider discrepancies between rural and urban areas, different cities or even different neighbourhoods within a city. In addition to domestic environment issues, the consideration of a city environment should also extend to the workplace, neighbourhood and even city-wide (Pacione 2009).

2.5.2 Gauteng and Pretoria

Even with some understanding of the African and South African context, cities differ further on a smaller spatial scale. It is beneficial to also consider the provincial and regional context of the city under investigation. If this context is not given as well, it is possible to evade the concerns about equity and liveability. Regions are generally defined based on criteria, for example, suburbs, rural or core areas, or based on shared cultural, political, economic or ecological characteristics. Emphasis should be placed on how such regions interact and work together. Problems may manifest at a regional level, but the causes and solutions of such problems may not be limited to the region. On the other hand, social justice and concerns are considered to be easier to address at a regional level if considered in isolation (Campbell 2009).

Socio-economic concern statistics within urban liveability can be broken down to a provincial and regional level as well. Once again based on the following statistics from a national household survey in 2016 (Statssa 2016)

- Density – The Gauteng province is the most populous in the country, and has a population of 13.4 million. Based on the size of the province this is an

average of 737 people per km². The average household size of 2.7 people per household is lower than the country average.

- Housing – The amount of people in formal housing in the province is 81.4%. Of this, approximately 24.8% is housing subsidised by the government. While the percentage of people with formal housing is higher, the percentage with subsidised housing is also higher than the national numbers.
- Unemployment – Within the City of Tshwane Metropolitan Municipality, 4.1% of the population are considered to live in poverty.
- Access to health and education – Disabilities are prevalent in 6.7% of the population.
- Services and infrastructure – 87.8% of the province have access to electricity, although the cost and security of electricity provision are challenges raised for the province specifically.

Similarly, the City of Tshwane Metropolitan Municipality's annual report gave further statistics, and information on their commitments to improvements in the 2015/16 financial year as follows (City of Tshwane 2017):

- Housing – 30 new community residential units were developed and 1 270 houses were built in the financial year. Six informal settlements were formalised.
- Unemployment – 21.1% of the citizens are unemployed, and the number of people living below the poverty line has been increasing since 2011. The municipality created 30 369 new income earning opportunities, facilitated the investment of R2.25 billion, and supported 5 138 SMME's (small, micro and medium enterprises) in the financial year.
- Access to health and education – Primary healthcare is provided through 24 fixed, 1 satellite and 2 mobile clinics. More than 1.2 million visitors were seen per annum and 97% of the population are within 5 km of a public health facility. In terms of education, only 57.3% of the population have a matric and/or post-matric qualification, while 3.9% have no schooling. One new library was constructed in the financial year.
- Services and infrastructure – 4 502 households were given access to water, 2 370 were given sanitation, 2 421 new electrical connections were established, 36 464 km of stormwater removal was constructed and 128 Wi-Fi sites were set-up.
- Transport and roads – 37 863 km of roads were proclaimed and 2.96 km of rapid transport busway lanes were completed.

These statistics indicate that urban areas seem to fair better at service and infrastructure provision than rural counterparts. Yet again, it could be beneficial to understand how the citizens themselves feel about this. Is the provision sufficient? Is the provision of infrastructure really what the community wants, or purely aimed at making the statistics improve? Is new construction even the best answer to

liveability concerns? This research will be an attempt to delve into some of these questions.

2.6 Perception studies

Perception in a geographical context can be described as the interaction between people and their environment – therefore similar to how liveability is defined. In this case the perception relates to (Rapoport 1977):

- The actual evaluation of an environment
- How an environment is understood, structured and learned, and
- The direct sensory experience.

Original perception studies focussed on man-environment relationships, the focus was on how people interact with the built environment, through (Rapoport 1977):

- How people shape their physical environment
- How the physical environment affects people
- Considerations of these two-way mechanisms

The term perception and studies conducted on such a basis is often subject to debate in scientific and geographical contexts. Both sides of the argument are worthy of discussion and comprehension for the sake of literature leading to the approach taken in this study.

It is argued that behavioural and perception-based research is of little value in a study field aiming to explain human activity (Bunting, Guelke 1979). Behavioural research in geography has been conducted since the 1960's, where researchers found that complexities and uniqueness observed in geographical settings in relation to humans relays to the interactions of individuals with their environment. These interactions and the subsequent evaluations are based on perceptions, preferences, beliefs and attitudes. The environmental conditions are expected to be variable, but the preferences are variable as well, describing a much more complex environment (Rushton 1979). The concern with the older studies especially is that with so many assumptions and variables there is not enough of a linkage to draw accurate conclusions. There should be an observed symmetry between the patterns and behaviours investigated. Newer studies have attempted to counter such concerns by successfully showing observed activity patterns that can be correlated to an influence by individual attributes and subjective evaluation processes (Rushton 1979).

Later research in the field has focussed on involving both quantitative and theoretical components to avoid the criticisms received by old studies. Additionally, the concern with later studies is that they are still only focussed on an image of how the individuals and their environment interact and can therefore not be used by

other geographers in a real-world setting (Bunting, Guelke 1979). The approach for such research is based on the acceptance of a theoretical premise that humans react to what they perceive, and that their own experience and knowledge determines how they interpret (Bunting, Guelke 1979).

It is described that the shortcomings of the field of study will be addressed if the study focusses on real and overt behaviour. This acknowledges that behaviour is multi-faceted and not exclusively influenced by and through behaviour. Other contemplations should also include social, political and economic considerations (Bunting, Guelke 1979). The importance is that multiplicity of environmental factors is suggested, including social, cultural, physical, economic and technological. While this means that there may be difficulties in making decisions based on perception because there are numerous role-players to consider, there are still reasons for such studies, most importantly the understanding that what is not known or acknowledged cannot lead to action (Rapoport 1977).

Regardless of different views on perception-based research, it is still acknowledged that objects and people are related through separation by space, meaning that geographical studies concerned with the interactions between people and their environment remain straightforward. The aim of this research is not to prove or disprove the validity of perception-based research in geography however, the study takes cognisance of the expected weaknesses and mitigations of criticisms within the field.

It should also be noted that the debate around perception-based research in geography has not continued through to recent times. Much of the published content was around the late 1970's, early 1980's. Environmental perception and behavioural geography are acknowledged as valid concerns within the dynamics of human and societal geography (Gaile, Willmott 2004).

2.7 Conclusion

Cognisance has been taken of existing literature in related topics within urban geography, as related to the study. A review was done of literature on the following topics:

- Urban liveability
- Urban growth and new buildings
- New buildings and socio-economic impacts
- Socio-economic concerns
- Context within time and space
- Perception-based research

In addition, the socio-economic concerns reflected on specific sub-topics including:

- Housing
- Unemployment
- Health and education
- Services and infrastructure – including transportation

It remains understood that urban phenomena are complex by nature and in this case combines urban and built environment with human and social geography, while also touching on African and third world urbanisation and social issues. The breakdown of how these are brought together and what is considered specifically for this study is discussed in the subsequent methodology section.

3 Methodology

Based on all the literature regarding urban liveability and closely related concepts, the study aims to focus on urban growth specifically through new construction, and the impacts thereof. These impacts are focussed on socio-economic concerns including housing, unemployment, health and education, services and infrastructure, and transport. Additionally, because of the spatio-temporal nature of the subject matter, the study is limited to the geographic region of Pretoria, South Africa – based on the delineation of the City of Tshwane municipal region. With urban liveability being a perception-driven concept (Pacione 2009), the study is focussed on the opinions of citizens regarding the perceived socio-economic impacts of new construction. In the acknowledgement of previous research within the subject matter, cognisance is taken of the known pitfalls associated with research focussed on perceptions and behaviours with geographical application. To this end, the study aims to ensure that the outcome would be of practical value and working towards what is needed. It is also understood that perception stems from a multiplicity of factors, and while the study mentions socio-economic concerns, it is expected that the opinions of citizens stem from social and economic experiences and perceptions, but also physical, political, technological and cultural. The methodology followed attempts to best obtain the information required to understand if new construction is perceived to have a positive impact on socio-economic aspects of urban liveability.

3.1 Introduction

The hypothesis for the study is:

$$H_1 = New\ construction\ is\ perceived\ to\ have\ a\ positive\ impact\ on\ socio - economic\ aspects\ of\ urban\ livability$$

$$H_0 = New\ construction\ is\ not\ perceived\ to\ have\ a\ positive\ impact\ on\ socio - economic\ aspects\ of\ urban\ livability$$

Sub-problems considered in this study include:

1. Do new residential buildings have a positive impact on urban liveability concerns regarding housing?
2. Do new industrial, commercial or retail buildings have a positive impact on urban liveability concerns regarding unemployment?
3. Do new health and education facilities have a positive impact on urban liveability concerns regarding access to health and education?

4. Does construction of new services (water reticulation, sewage network, and landfills) have a positive impact on urban liveability concerns regarding basic services?
5. Does construction of new transport infrastructure have a positive impact on urban liveability concerns regarding accessibility?

The population of Pretoria is estimated to be approximately 3.5 million people in 2017 – based on the 2.9 million measured at the 2011 census and the approximate population growth rate of 3% per annum (Statssa 2016)

The sample size should be approximately 267 respondents to ensure a confidence level of 95% with a confidence interval of 6%. Detail on this calculation can be found in section 3.4.4 dealing with sample size.

3.2 Research setting

The research is focused on Pretoria as delineated by the City of Tshwane Metropolitan Municipality. The context of this delineation is shown in Figure 2 with regards to the Gauteng municipality.

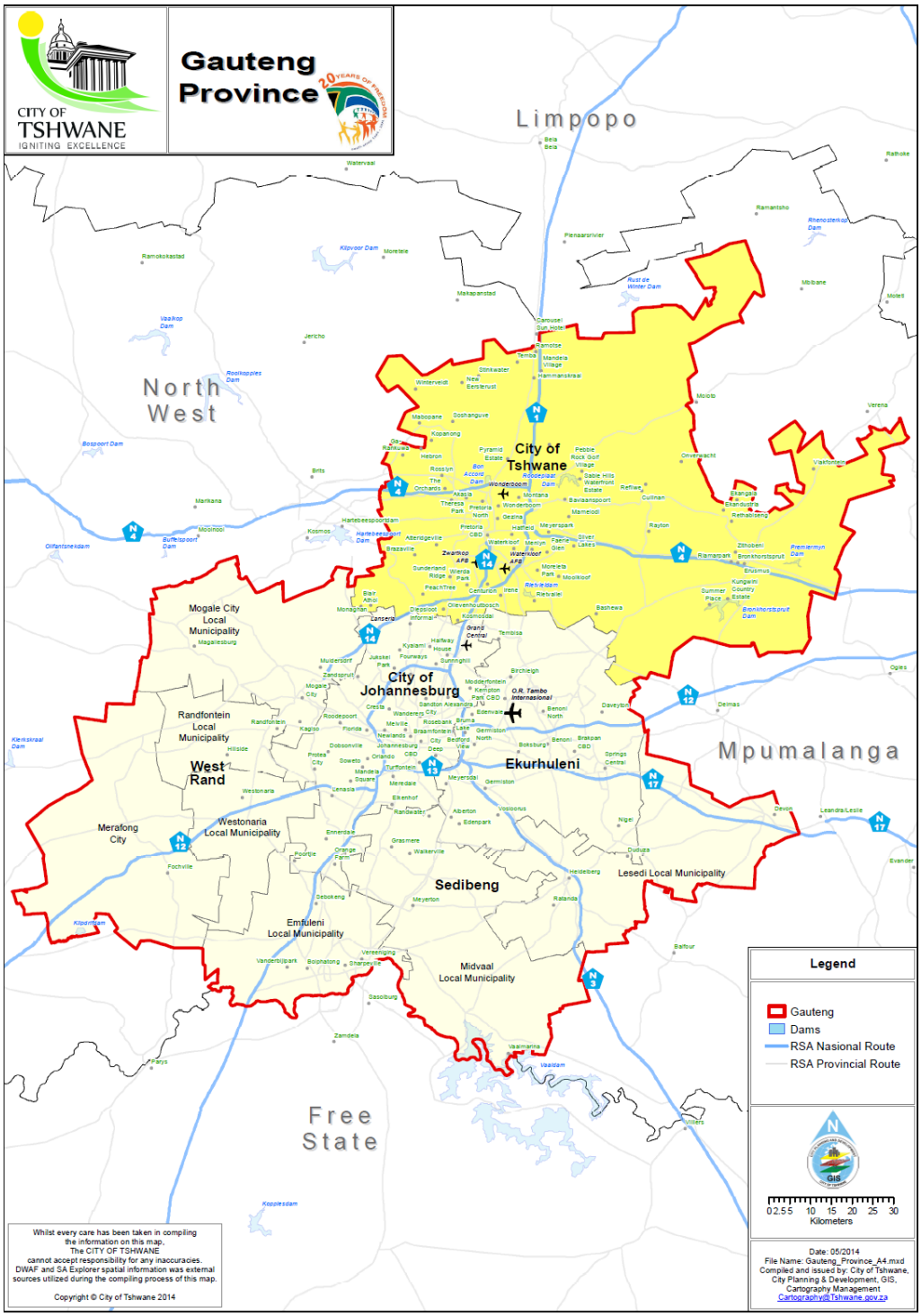

Figure 2: City of Tshwane delineation

Within the City of Tshwane region, there is further division into 7 regions and 105 districts distributed within these regions as shown in Figure 3. While the study will make reference to attempts to ensure representation from the different districts and regions, the results are mainly focussed on the liveability within the entire Tshwane region.

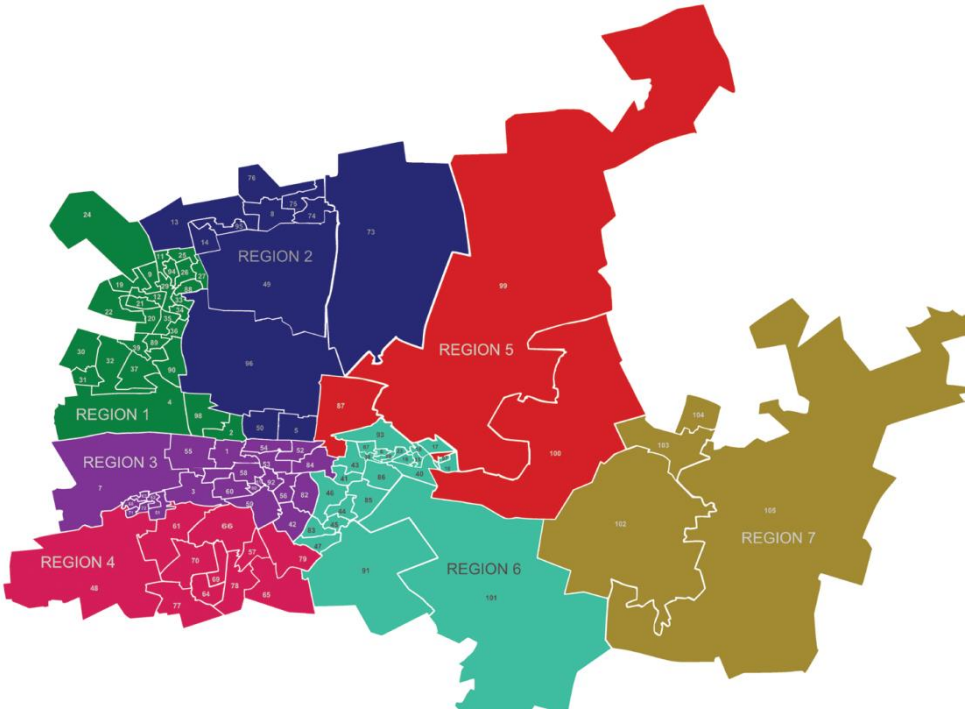

Figure 3: City of Tshwane regions and districts

The City of Tshwane Metropolitan Municipality is the fifth most populous in South Africa with a population of 2 921 488 as measured at the last census in 2011. With an area size of 6 298 km², the population density at the same time was 464 persons / km². If the historic population growth rate of 3.1% is applied, the population can be extrapolated to be approximately 3.5 million with a population density of 556 persons / km² by 2017.

The sample selection only has one selection criteria – that the respondent be currently living and/or working in Pretoria. Additional validity criteria for ethical purposes require that the respondent be (De Vaus 2014):

- willing,
- mentally sound,
- over 18 years of age and
- of any sex or race.

Questions regarding location and income-class are not part of the selection criteria, and will be used to determine the sample bias in terms of geographic representation and income class.

3.3 Approach and design

As an empirical study, the research aims to provide answers through direct, observable information. The observable information is collectively described as data. The data can be in a quantitative – numerical data; or qualitative – non-

numerical mostly worded data format (Punch 2014). In this case, the study will entail to some extent a mixed-method approach with both quantitative and qualitative outputs. The aim of a multi-method qualitative study is to combine the qualitative outputs with some quantitative and statistical information (Collier, Elman 2008). Quantitative research is based on pre-specified questions with tightly structured data and looks for answers (Punch 2014). The qualitative element is only applicable to data that does not have a numerical structure and categories that can be developed prior to data collection. The aim would be to add structure a posteriori (after the fact) to enable quantitative analysis of such data as well (Punch 2014).

For research to be scientific in nature, data needs to be collected to enable building theories resulting in the ability to describe and/or explain the data to test such theories (Punch 2014). The aim of this study will be to answer the five sub-questions in order to subsequently confirm or reject the study hypothesis.

3.4 Data collection

Data collection utilised both primary and secondary sources. Secondary sources involved in analysing existing literature. Primary sources included interviews and discussions, but mainly through the use of structured questionnaires to enable discerning the data under investigation.

3.4.1 Collection method used

A questionnaire is a highly structured form of asking questions to receive a response (Sapsford, Jupp 2006). The questionnaire can be self-administered or conducted through interviews, and the questions to be answered should be unambiguous, easy to read and the respondent should be clear on what action is required from them. In this study, the questionnaires were distributed via a link to an online survey hosted on the website or via manual printed versions of the same questionnaire. The electronic link to the questionnaire was:
https://www.surveymonkey.com/r/Pretoria_Liveability

The manual surveys were made available at random prominent settings within the city – including libraries, license centres, hospitals, community centres, and points of public transport. The link to the online survey was circulated on social media, via e-mail and was also available at the random prominent settings where the manual surveys were handed out.

Questionnaires were selected as collection method mainly because they tend to (Sapsford, Jupp 2006):

- have fairly high response rates,

- do not take a lot of time and energy,
- encourage anonymity,
- minimise bias (for example by an interviewer) and
- Result in comparable responses.

Archival research was only used as a supplement for social statistics in the literature review of the subject. Interviews or assistance with questionnaires was used in instances where self-administered questionnaires were not possible. For example, if the respondent was uncomfortable with their own literacy level or answering in English. The interviews and assistance remained in the format of the questionnaire, and the results were still captured on a questionnaire. In each instance, the respondent still signed that the results reflected their own answers.

3.4.2 Questionnaire content

The questionnaires were designed using information discussed in the literature review and aimed to lead respondents towards answering the research question and sub-questions. The majority of the questions were tick box categories or binary in nature. This was to ensure that respondents could answer quickly and easily, as well as allow for some quantitative analysis and comparisons of data. Routing of questions was avoided as far as possible to assist with the self-administered nature of distribution as anticipated. The questionnaire length was limited in order to allow for maximum responses. Low response rates could result in small or unrepresentative sample sizes.

When investigating underlying attitudes towards a construct such as the city of Pretoria in this case, the construct should have some form of criterion validity and predictive measure (Sapsford, Jupp 2006). Because a structured questionnaire does not always allow for expansion from the pre-set categories, the questionnaire does provide areas for further explaining of answers. These open-ended or uncoded questions were minimised as far as possible, but will provide a platform for explanation of results to consider underlying discussions that can be translated only after receiving the responses (Sapsford, Jupp 2006).

Using self-administered questionnaires as far as possible will mitigate the possibility of systemic biases distorting according to interviewer interpretation (Sapsford, Jupp 2006). Care was taken to avoid acquiescence bias through respondents feeling that they should attempt to please any data-collectors or relevant parties by answering what they believe is the “right” answer. To this end, the survey information highlighted the fact that the survey is specifically interested in personal opinions, there will be no repercussions for any answers or comments given, and great care was taken to keep results completely anonymous.

The questionnaire was divided into six sections:

- General
- Housing
- Unemployment
- Health and Education
- Service Provision
- Accessibility
- Overall and comments

The questionnaire is added as an appendix to the document in 8.1. The general section contained questions regarding the neighbourhood and income class association of the respondent. These questions did not have an impact on the determination of the hypothesis or sub-problems, but assisted with detecting and determining the extent of bias in the responses received, and could be used in further analysis of the responses received.

The sections on housing, unemployment, health and education as well as service provision were aimed at gathering the opinion on liveability in Pretoria regarding each of these sub-sections in-line with the respective sub-questions. The questions within these topics are repeated, with the exception of being related to each of the different topics.

Some sections contained an additional question or two. These questions had been suggested by the City of Tshwane Metropolitan Municipality Planning Department after being identified as related content that could be of use in assisting to answer the sub-questions of the study or get a better overview of the sub-section.

3.4.3 Interviews

Interviews were conducted with relevant stakeholders at the City of Tshwane Metropolitan Municipality Planning Department. The main reason for the discussions was to attempt to align the study with information that the municipality would like to investigate and gather more information on. This would ensure that the results could become usable in implementation discussions at a municipal planning level as well. Correspondence resulted in an official indication from the City of Tshwane Metropolitan Municipality that they are interested in the outcome of the study, and approve of the research. The approval letter is appended to this document as 8.2. They were also given access to the draft questionnaire prior to distribution, and their recommendations have been incorporated into the final questionnaire. Their requests included separating the section for “transportation” from the rest of the “services provision” to enable separate analysis of

transportation as well as the inclusion of specific questions such as: “Will the respondent be willing to live in and/or support a neighbourhood with a mixture of income classes and housing options?” None of the suggested changes altered the nature of the study or any of the questions under investigation, but purely provided a more detailed qualitative analysis. The changes were therefore incorporated.

3.4.4 Sample size

Pretoria has a population of 3.5 million. Therefore, to obtain a sample with a confidence interval of 6%, and confidence level of 95% approximately 267 responses are required. This is based on the formula:

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

Where:

ss = sample size

Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level

p = percentage picking a choice represented as a decimal ∴ 0.5 for determining sample size

c = Confidence interval as a decimal ∴ 0.06 for ±6%

(Creative Research Systems 2017)

The population size of the study is too large to include it all, therefore sampling is required. Random sampling is the purest form of sampling, but in the case of this population and the distribution of the research, response rates are likely to be fairly low with a purely random sample, and the selection of subjects will still have some bias (Punch 2014). Snowball sampling is selection by referral. While this method is known to be biased, it can result in an increase in sample size. Snowball sampling was applied in the electronic distribution of the link, as respondents had to have received the questionnaire from in an e-mail format or have seen the link on social media. Manual questionnaire completion gathered the majority of respondents in comparison to electronic link distribution. The random sampling in the distribution of manual questionnaires still had a starting point, as specific points of distribution were used. The attempt was to have a wide range of starting points in nature, and in geographical distribution throughout the city. Places like sidewalks, transport hubs, libraries, and shopping centres were used, at varying locations. The handling of the expected bias of this method will be discussed in section 3.5.

3.4.5 Pilot

A pilot of the questionnaire was done involving five citizens from different neighbourhoods, income classes, and educational backgrounds to test the questionnaire. Participants were asked to comment on the ease of understanding the questions, and the ease of responding to the questionnaire. The intention was to adapt the questionnaire accordingly. The only changes suggested at this stage were to convert some open-ended questions to multiple choice and to reiterate that the survey is looking for personal opinions to ensure that respondents do not doubt their own adequacy to answer the questions.

The City of Tshwane Metropolitan Municipality Planning Department was also asked for comments on the proposed questionnaire and the usability of results in a municipal context. Their suggestions are discussed in section **Error! Reference source not found.** and any changes were incorporated prior to the distribution of the pilot.

3.4.6 Analysis

All manual survey responses were also captured on the electronic platform, and results were exported to Microsoft Excel. Because of tick box and binary questions, this eased the analysis of data in a statistical format. For open-ended questions, all responses were read and analysed before categorising to ease further analysis (Punch 2014). Responses from the online survey could be viewed immediately, while manual questionnaires had to first be converted into the electronic platform.

The categorisation of open-ended questions was done during the analysis itself. Data analysis of the questions is discussed in each of the sub-sections in section 5. The analysis entails detailing the statistical results of the question responses as well as a detailed discussion on the qualitative responses to the survey and how this relates to the sub-question posed. A summary of the answers to each sub-question is also discussed in section 6, which addresses the conclusion of results.

3.5 Reliability and validity

Reliability relates to how well the experiment will be able to produce the same results if repeated (Carmines, Zeller 1979). Because some margin of error is expected of any research, the results are denoted with a confidence interval. In addition, attention is paid to expected biases in the study and mitigation measures to minimise these biases.

The sample for the study should be random and representative. The ability to achieve a fully random sample is limited by various factors including the fact that the population size is very large. There are some expected biases that could affect the sample, and adjustments can be made to the methodology to minimise these biases. These biases are as follows:

- Because of a fairly large geographical area the sample should represent different regions within the area. The results could also differ based on the region represented in the responses. For this reason, the questionnaires were distributed at various points throughout the area. Additionally, the questionnaire contained a question requesting the neighbourhood or area of the respondent to enable calculation of the extent of the bias. This enabled the results to indicate bias in terms of geographical area.
- Different income classes are expected to have differing opinions and should therefore be represented. It was also anticipated that electronic questionnaires would not reach lower income classes, therefore electronic questionnaires were supplemented with distribution of manual questionnaires.
- The methodology targeted a snowball sampling method, which relied on respondents finding out about the survey from one of the starting points. There is a question in the questionnaire that aimed to find out if there is a bias in how respondents came to hear of the questionnaire – i.e. the starting point of the snowball effect.

3.6 Research limitations

As discussed in most sections, the scope in time, space and criteria have been whittled down to ensure an effective study with better results. On the other hand, enhancing the scope over another time-period, in another location, or with broader or different criteria can prove topics for further or additional research.

One aspect of socio-economic concern and urban liveability that has been explicitly excluded from the study, even though it appears to fall within the scope of the study, is crime and violence. Crime and violence have been noted as one of the top five leading socio-economic challenges in South Africa. The other four factors (water supply, unemployment, housing and electricity) are all addressed to some extent in this study. Approximately 7.5% of the population have reported to have been a victim of crime while only 34% of the population feel safe when it is dark, although this improves to 79.4% who feel safe during daytime (Statssa 2016) it is still a low percentage in general. The reason for the exclusion of crime information is that it is considered an extensive issue with concerns that would not have been sufficiently addressed within the scope of this study. As a stand-alone topic, it would

still be beneficial to do further urban liveability studies specifically on safety and security and the intricacies thereof. Whilst it was expected to exclude this from the study, issues of crime and safety concerns were often mentioned as part of the responses gathered on liveability in Pretoria. Again, this highlights that crime and violence is a factor that is important to the citizens – this is discussed in more detail in section 5.

Also excluded from this study is the provision of practically implementable solutions. While it can be agreed that urban liveability is a concern, the practical applications of corrective action is less straightforward. In addition, the aim of a case study should be the possibility of learning and improvement. Suggestions of who should be responsible include government, large corporations, NGO's, society or even political parties (Silva-Ochoa 2009). It has been found that the most effective solution is a combination of communities, NGO's and political party representatives. Communities are able to build their identities based on the area's geography, history and the citizen's shared circumstances. Their lack of power and homogeneity makes it difficult for them to reshape their environment alone. NGO's on the other hand are able to assist with the mobilisation and integration processes with their global networks that transcend local politics. They are able to facilitate alliances even though they lack the ability to execute. Political parties or political representatives have historically shown more self-interest and interest in power, yet they can assist with being a vehicle to reach approvals and support (Evans 2002). An example of such joint relationships working together successfully was when the Brazilian sanitation agency realised that they lack the finances and labour-resources to deliver service infrastructure (specifically sewers) to poorer urban neighbourhoods(Evans 2002). Their successful solution was for them to provide the required materials and support (technical and administrative) while the communities complete the work themselves (Evans 2002). While this does not form part of this specific study, it is noticeably best if knowledge can be applied practically. Further research can be aimed at providing solutions – even if it is in a case study or pilot project format – to establish better liveability within a specific city environment.

It is understood that the Pretoria region as delineated by the City of Tshwane boundaries does include a significant portion of rural land. This study almost explicitly excludes rural areas as it is specifically aimed at urban liveability and has a main component regarding new buildings and construction. The study does not consider the unique set of socio-economic concerns experienced by rural areas nor does it really seek to understand the interactions of rural areas in such close proximity to urban areas. This is also discussed further in section 4.

While this study specifically excludes these aspects, these could form the basis for interesting future research or expansion of the study.

3.7 Ethical considerations

The study was granted ethical approval to engage human participants through the Faculty of Natural and Agricultural Sciences Ethics Committee at the University of Pretoria. The ethical approval declares that:

- All signatories have read the guidelines for such ethical approval in full
- The principal and co-researchers and the University of Pretoria do not contravene the principles of the Constitution of the Republic of South Africa, especially the Bill of Rights in Chapter 2
- Ethical practices will be applied in every aspect from inception to publishing
- Cognisance is taken of any South African legislation applicable to using human participants for research, including the National Health Act (61 of 2003) and the Children's Act (38 of 2005)
- The identity of human participants, the nature of the research and the results thereof will remain confidential

In the collection of responses, each respondent was informed of the extent and purposes of the study and what participation would entail. All respondents signed that they understood and that they do give consent. Respondents were informed that:

- Participation is voluntary
- The responses will remain strictly confidential and anonymous
- The survey may be discontinued at any time without giving a reason
- Respondents may choose not to answer any particular questions
- The majority of questions are in multiple choice or "yes/no" format to save time and assist with responses, but discussions may be as brief or detailed as the respondents feel is necessary
- Any additional discussions or comments could be added in the space provided
- There are no direct benefits or remuneration for completing the study

The study did not work with sensitive human subjects like children or the physically or mentally ill, as the prerequisite was that all participants had to be (De Vaus 2014):

- willing
- mentally sound
- over 18 years of age
- of any sex or race

3.8 Conclusion

The study aimed to consider public opinion of the socio-economic aspects of urban liveability, and the impact of new buildings on these socio-economic aspects. The study is limited to the geographic region of Pretoria, South Africa – based on the delineation of the City of Tshwane municipal region. The study aimed to prove the hypothesis: New construction is perceived to have a positive impact on socio-economic aspects of urban liveability.

The study specifically looked at the following categories:

1. Housing problems and new residential buildings
2. Employment problems and new industrial, commercial or retail buildings
3. Access to health and education and new health and education facilities
4. Service provision problems and construction of new services (water reticulation, sewage network, and landfills)
5. Transport and accessibility problems and new transport infrastructure

Based on the approximate 3.5 million people population size of Pretoria in 2017 a sample size of 267 respondents are required to ensure a confidence level of 95% with a confidence interval of $\pm$6%.

The data analysed in this study, stems from the responses of a questionnaire. Because some biases were expected, the questionnaire aimed to determine the extents of these biases by incorporating questions to this effect in the study. The questionnaire was made available on an electronic platform as well as a manual questionnaire option. The manual surveys and link to the electronic questionnaire were available at various points throughout the city in an attempt to randomise the sample.

4 Results - data analysis

The data analysis of the results is mainly quantitative in nature, determining the responses to the research hypothesis and the separate sub-problems. Further detail on the results and qualitative discussions form part of the next chapter: 5 Results – discussion of findings.

4.1 Introduction

The hypothesis that needs to be determined for this study:

$$H_1 = New\ construction\ is\ perceived\ to\ have\ a\ positive\ impact\ on\ socio - economic\ aspects\ of\ urban\ livability$$

$$H_0 = New\ construction\ is\ not\ perceived\ to\ have\ a\ positive\ impact\ on\ socio - economic\ aspects\ of\ urban\ livability$$

This is done by concluding results for each of the following sub-problems for the study:

1. Do new residential buildings have a positive impact on urban liveability concerns regarding housing?
2. Do new industrial, commercial or retail buildings have a positive impact on urban liveability concerns regarding unemployment?
3. Do new health and education facilities have a positive impact on urban liveability concerns regarding access to health and education?
4. Does construction of new services (water reticulation, sewage network, and landfills) have a positive impact on urban liveability concerns regarding basic services?
5. Does construction of new transport infrastructure have a positive impact on urban liveability concerns regarding accessibility?

The study received responses from 299 respondents to the questionnaire. This exceeds the initial minimum of 267 respondents as discussed in the methodology section. Therefore, for a confidence level of 95% on the overall study, a confidence interval of 5.2% is calculated.

ss = 299

Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level

p = 0.702

c = Confidence interval

(Creative Research Systems 2017)

$$ss = \frac{Z^2\ (p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\ (0.5)(0.5)}{299}} = 0.057 = \pm 5.7\%$$

Confidence interval calculations are also conducted for each of the individual sections, because the number of respondents and the amount responding in positive (p-value) differ per section as some respondents chose not to participate in certain sections or questions.

4.2 General demographics

Collection of the general demographics of respondents is not used to determine the responses to any of the sub-questions, but is aimed to highlight any biases observed in the results.

A vast majority (93%) of respondents lived in Pretoria, while 55% of respondents worked in Pretoria. All respondents were in an age category expected to be economically active – prerequisite to be over 18 years of age, and no indication of retirees. The population that live, but do not work in Pretoria included those who commute to other nearby cities or regions as well as the unemployed.

The study also showed a larger number of people living and working in the Central and Old East areas of Pretoria (including the CBD). The least represented areas were Centurion and Pretoria West.

The study also had almost no respondents from surrounding rural and agricultural areas. This is not anticipated to be of concern for a study focussing on urban liveability. There was a fair amount of representation for respondents coming from township, inner city and suburb types of areas. Commuting was also highlighted, especially in the townships, where a much smaller percentage worked in contrast to the percentage of those that live there.

Income class showed a higher number of respondents in the lower and middle income classes, declining to the lowest representation in the high income category. This is expected to correlate with the population where the high income class is much smaller than the middle and lower income classes.

Due to question failure, no bias could be determined regarding where information from respondents was collected.

There was no question or subsequent analysis conducted on the race, culture, gender or political affiliations of the respondents.

4.3 Housing

The housing section of the survey answered the first sub-question of the study:

1. Do new residential buildings have a positive impact on urban liveability concerns regarding housing?

Of all those participating in the survey, 290 respondents chose to answer this section on whether Pretoria is a good city to live in – of these 90.3% felt that it is. Therefore, for a confidence level of 95% on this question:

ss = 290
Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level
p = 0.903
c = Confidence interval
(Creative Research Systems 2017)

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\,(0.903)(1-0.903)}{290}} = 0.034 = \pm 3.4\%$$

Therefore, with 95% certainty, the population of Pretoria are between 86.9% and 93.7% likely to believe it is a good city to live in.

With similar calculations, between 53.8% and 65.2% of the population are likely to believe that there is a housing problem in Pretoria.

$$c = \sqrt{\frac{(1.96)^2\,(0.595)(1-0.595)}{284}} = 0.057 = \pm 5.7\%$$

While this is still above 50%, it is not a very high result indicating that it is either not perceived as an important socio-economic concern, or a portion of the population is unaware of the concerns experienced by others in the population.

On the other hand, between 69.6% and 80.2% of the population are likely to believe that construction of new residential buildings will be the answer to a housing problem.

$$c = \sqrt{\frac{(1.96)^2\,(0.749)(0.251)}{259}} = 0.053 = \pm 5.3\%$$

This result shows that people in Pretoria are much more likely to believe that construction is likely to be the answer to a housing problem, than they are likely to believe there is a housing problem.

Therefore, it is likely that new residential buildings will have a positive impact on urban liveability concerns regarding housing.

Information on why Pretoria is considered a good city, the type of housing that is most required and the area/neighbourhood where the housing would be more beneficial, willingness to live in a neighbourhood of a mix of income classes and housing types are qualitative questions that can give further details on the expected impacts. These results can be viewed in section 5 Results – discussion of findings.

4.4 Unemployment

The unemployment section of the survey answered the second sub-question of the study:

2. Do new industrial, commercial or retail buildings have a positive impact on urban liveability concerns regarding unemployment?

Of all those participating in the survey, 286 respondents chose to answer this section on whether Pretoria is a good city to work in – of these 87.8% felt that it is. Therefore, for a confidence level of 95% on this question:

ss = 286
Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level
p = 0.878
c = Confidence interval
(Creative Research Systems 2017)

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\,(0.878)(0.122)}{286}} = 0.038 = \pm 3.8\%$$

Therefore with 95% certainty, the population of Pretoria are between 84.0% and 91.6% likely to believe it is a good city to work in.

With similar calculations, between 78.5% and 87.2% of the population are likely to believe that there is an unemployment problem in Pretoria.

$$c = \sqrt{\frac{(1.96)^2\,(0.829)(0.171)}{280}} = 0.044 = \pm 4.4\%$$

At even higher percentages, between 83.8% and 91.7% of the population are likely to believe that construction of new industrial, commercial and retail buildings will be an answer to the unemployment problem in Pretoria.

$$c = \sqrt{\frac{(1.96)^2\,(0.877)(0.123)}{269}} = 0.039 = \pm 3.9\%$$

Based on the high percentages and likelihoods of all three these questions it is likely that new industrial, commercial and retail buildings will have a positive impact on urban liveability concerns regarding unemployment.

Information on why Pretoria is considered a good city to work in, the type of buildings that are most required, and the area/neighbourhood where these buildings would be more beneficial, are qualitative questions that can give further details on the expected impacts. These results are explained in section 5 Results – discussion of findings.

4.5 Health and education

The health and education section of the survey answered the third sub-question of the study:

3. Do new health and education facilities have a positive impact on urban liveability concerns regarding access to health and education?

Of all those participating in the survey, 279 respondents chose to answer this section on whether Pretoria has good health and education services – of these 82.4% felt that it does. Therefore, for a confidence level of 95% on this question:

ss = 279
Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level
p = 0.824
c = Confidence interval
(Creative Research Systems 2017)

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\,(0.824)(0.176)}{279}} = 0.045 = \pm 4.5\%$$

Therefore, with 95% certainty, the population of Pretoria are between 78.0% and 86.9% likely to believe that Pretoria has good health and education services.

With similar calculations, between 71.3% and 81.4% of the population are likely to believe that there is a problem with health and education services in Pretoria.

$$c = \sqrt{\frac{(1.96)^2\,(0.764)(0.236)}{275}} = 0.050 = \pm 5.0\%$$

The fact that both of these are fairly high percentages could indicate that while people generally believe that health and education services are good, they still believe there are problems and that there is room for improvement.

On the other hand, between 75.4% and 85.1% of the population are likely to believe that construction of new health and educational facilities will be the answer to the problems experienced.

$$c = \sqrt{\frac{(1.96)^2\,(0.802)(0.198)}{258}} = 0.049 = \pm 4.9\%$$

This result once again shows that people in Pretoria are slightly more likely to believe that construction can be the solution to the health and education problem, than they are to believe there is actually a health and education problem.

With high likelihoods and percentages it is shown that new health and education facilities have a positive impact on urban liveability concerns regarding access to health and education

Information on why Pretoria is considered to have or not have good health and education services, the type of facilities that are most required, and the area/neighbourhood where these buildings would be most beneficial are qualitative questions that can give further details on the expected impacts. These results are analysed in section 5 Results – discussion of findings.

4.6 Service provision

The service provision section of the survey answered the fourth sub-question of the study:

4. Does construction of new services (water reticulation, sewage network, and landfills) have a positive impact on urban liveability concerns regarding basic services?

Of all those participating in the survey, 276 respondents chose to answer this section on whether Pretoria has good service provision – of these 76.1% felt that it is. Therefore, for a confidence level of 95% on this question:

ss = 276
Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level
p = 0.761
c = Confidence interval
(Creative Research Systems 2017)

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\,(0.761)(0.239)}{276}} = 0.050 = \pm 5.0\%$$

Therefore, with 95% certainty, the population of Pretoria are between 71.1% and 81.1% likely to believe that it has good service provision.

With similar calculations, between 69.4% and 79.7% of the population are likely to believe that there is a need for services.

$$c = \sqrt{\frac{(1.96)^2\,(0.745)(0.255)}{271}} = 0.052 = \pm 5.2\%$$

While this is still a fair amount above 50%, it is not a very high result indicating that it is either not perceived as an important socio-economic concern, or a portion of the population is unaware of the concerns experienced by others in the population.

On the other hand, between 80.1% and 89.1% of the population are likely to believe that construction of new services (laying water pipes, expanding the sewage network, new landfills and recycling facilities) will be the answer to a services problem.

$$c = \sqrt{\frac{(1.96)^2\,(0.846)(0.154)}{247}} = 0.045 = \pm 4.5\%$$

This was one of very few questions in the survey that had respondents below the targeted minimum of 267 as determined in the methodology. On the online platform, this question was accidentally set as an open-ended response instead of the intended binary approach of “yes” and “no”. While all those that answered the question still answered in a binary nature, this could explain why fewer people responded to this question. The lack of binary indication could have been confusing to some respondents.

This result once again shows that people in Pretoria are far more likely to believe that provision of new services could be the solution than they are to believe that there is actually a service provision problem.

Based on the positive responses and likelihoods of population representation of all three these questions it is likely that construction of new services will have a positive impact on urban liveability concerns service provision.

The results for qualitative questions that can give further details on the expected impacts such as details on why service provision is considered good or not good, the type of services that are most required, and the area/neighbourhood where these services would be more beneficial are discussed in the discussion of the results chapter.

4.7 Transport and accessibility

The transport and accessibility section of the survey answered the final sub-question of the study:

5. Does construction of new transport infrastructure have a positive impact on urban liveability concerns regarding accessibility?

Of all those participating in the survey, 279 respondents chose to answer this section on whether Pretoria has good transport infrastructure – of these 80.2% felt that it does. Therefore, for a confidence level of 95% on this question:

ss = 279
Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level
p = 0.802
c = Confidence interval
(Creative Research Systems 2017)

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\,(0.802)(0.197)}{279}} = 0.047 = \pm 4.7\%$$

Therefore, with 95% certainty, the population of Pretoria are between 75.6% and 85.0% likely to believe it has good transport infrastructure.

With similar calculations, between 57.7% and 69.2% of the population are likely to believe that there is a need for better transport infrastructure in Pretoria.

$$c = \sqrt{\frac{(1.96)^2\,(0.634)(0.366)}{268}} = 0.058 = \pm 5.8\%$$

While this is still above 50%, it is not a very high result indicating that it is either not perceived as an important socio-economic concern, or that different portions of the population are not aware of the concerns experienced by others in the population.

On the other hand, between 67.3% and 78.7% of the population are likely to believe that construction of new residential buildings will be the answer to a housing problem.

$$c = \sqrt{\frac{(1.96)^2\,(0.673)(0.787)}{233}} = 0.057 = \pm 5.7\%$$

This was another of the very few questions in the survey that had respondents below the targeted minimum of 267 to ensure a 95% level of certainty, with a 6% confidence interval as determined in the methodology. No problem could be detected with the question in the survey that could result in a lower response. The lower response rate could possibly be related to the fact that it only came later in the questionnaire, meaning respondents could have gotten tired of answering questions and could have been lazier with their responses.

However, all three of these questions still had fairly high percentages and likelihoods, making it likely that new transport infrastructure will have a positive impact on urban liveability concerns regarding accessibility.

Information on why Pretoria has or does not have good transport infrastructure, the type of transport infrastructure that is most required, and the area/neighbourhood where this would be most beneficial are detailed as qualitative and contextual answers in section 5 Results – discussion of findings.

4.8 Overall

The overall comments section aimed to get an answer for the hypothesis that is separate from the sum of opinions in the individual sub-questions:

- Is there a perception that new construction will have a positive impact on socio-economic aspects of liveability?

Of all those participating in the survey, 235 respondents chose to answer this section on whether construction is the best way to address socio-economic concerns – of these 70.2% felt that it is. Therefore, for a confidence level of 95% on this question:

ss = 235
Z = Z-value for confidence level, ∴ 1.96 for a 95% confidence level
p = 0.702
c = Confidence interval
(Creative Research Systems 2017)

$$ss = \frac{Z^2\,(p)(1-p)}{c^2}$$

$$c = \sqrt{\frac{(1.96)^2\,(0.702)(0.298)}{235}} = 0.058 = \pm 5.8\%$$

Therefore, with 95% certainty, the population of Pretoria are between 64.4% and 76.1% likely to believe new construction is the best way to address socio-economic concerns. This was another of the very few questions in the survey that had respondents below the targeted minimum of 267 to ensure a 95% level of certainty with a 6% confidence interval as determined in the methodology. The lower response rate could possibly be attributed to the fact that it was almost the last question in the questionnaire, meaning respondents could have gotten tired of answering and could have been lazier with their responses.

Suggestions on alternative solutions, additional action suggestions, further respondent comments and respondent bias to their own geographical areas, are detailed as qualitative and contextual answers in section 5 Results – discussion of findings.

4.9 Conclusion

The conclusions are drawn considering the results for each section as shown in Table 2 and further represented graphically Figure 4.

Table 2: Results for each sub-section

Question	Socio-economic concern	Expected population positive that new construction will address concerns
1	Housing	69.6 – 80.2%
2	Unemployment	83.8 – 91.7%
3	Health and Education	75.4 – 85.1%
4	Service Provision	80.1 – 89.1%
5	Transport and accessibility	67.3 – 78.7%
Overall	Socio-economic concerns	64.4 – 76.1%

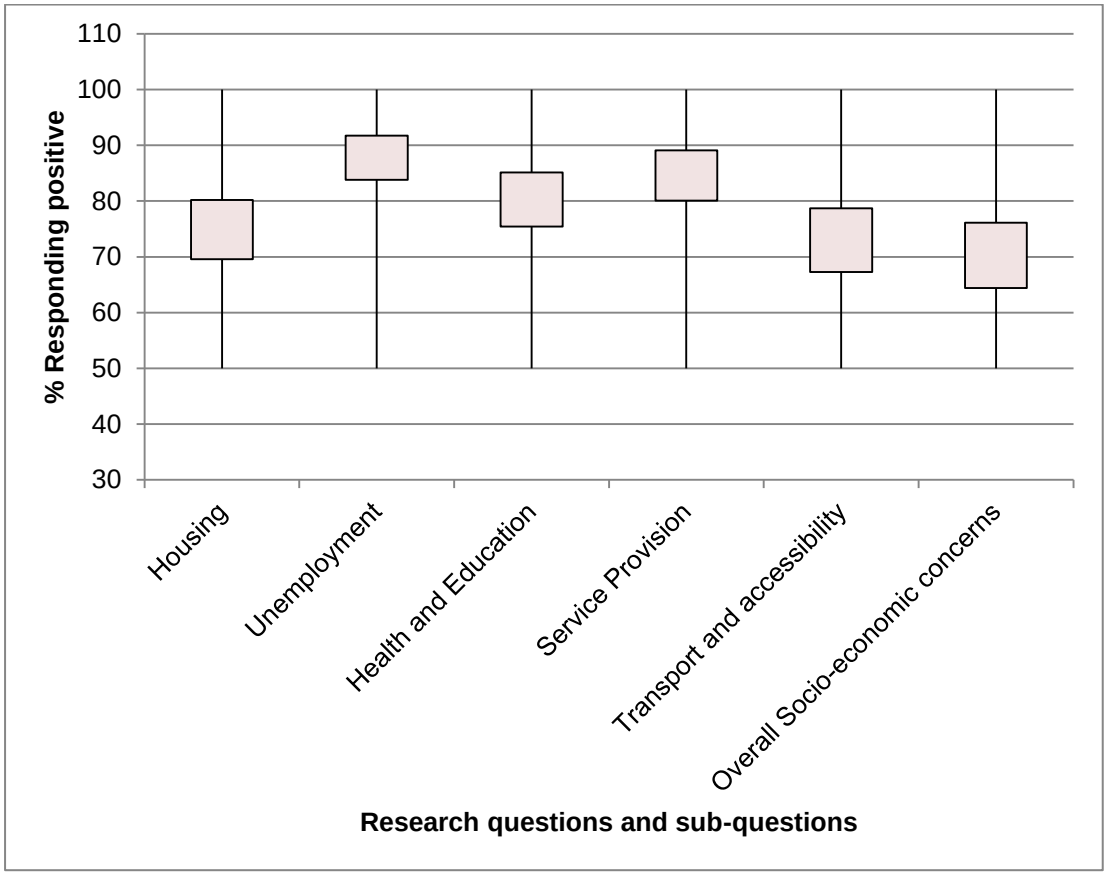

Figure 4: Graphic representation of results to each sub-section

From these results, it is likely that there is a perception that construction will have a positive impact on socio-economic aspects of urban liveability for all the sub-questions individually as well as the overall question.

Higher percentages are expected to indicate that the population feel more strongly that construction will be the solution for such a particular socio-economic concern. It could also be an indication of the socio-economic concerns that the respondents feel strongest about. Lastly, the lower percentages for the overall question in comparison with each of the sub-sections could also indicate candidate willingness to suggest alternative solutions and additional actions in the directly subsequent open-ended questions.

5 Results – discussion of findings

5.1 Introduction

The data for this specific survey was all captured on an electronic platform hosted on surveymonkey.com. The electronic platform allowed exporting of all of the data into Microsoft Excel for further analysis leading to the results as discussed in the remainder of this chapter. The results are analysed in the same categories that the questionnaire is divided into. These categories also directly relate to the sub-problems for the hypothesis, which will ease the analysis and discussion of the results as they are presented.

5.2 General demographics

Whilst the study remains anonymous, some general demographic questions were asked to enable determining possible bias. General demographics can also be used as a further tool in the analysis of subsequent categories.

5.2.1 Area or neighbourhood

The question of area or neighbourhood where the respondent lives and/or works was compulsory, as living and/or working in Pretoria was a prerequisite for respondents to partake in the study. The intention of the study was to collect the opinions of the actual citizens of Pretoria, not opinions of external parties on the same issues. This is because liveability relates to how a city environment is experienced and perceived by those that are familiar with the area through personal opinions.

Of the total respondents, 48% both lived and worked in Pretoria, 45% only lived in Pretoria – this included anyone who commuted to work in another city, as well as the unemployed. People who only worked in Pretoria and commuted from elsewhere only amounted to 7%. The statistics for those working in Pretoria are based on the 55% that work in Pretoria, while the statistics for those living in Pretoria are based on the 93% that live in Pretoria.

The question was left open-ended, as not all people are familiar with municipal delineation of regions. Also, municipal regions cover a variety of geographical areas that could have been analysed separately. It is also unpractical to list all possible suburbs in Pretoria for selection. Based on the neighbourhood responses received, these were categorised according to which general region it is situated. These were

the same area categories given as options at later stages throughout the survey. Whilst the categories are based on perception and individual understanding of the city, for the purposes of analysis, these were delineated as follows in Table 3 and Figure 5.

Table 3: Area category descriptions

Category	Delineation division	Corresponding municipal region
Pretoria East and Far East	East of the N1 highway, and North-West of the R21 highway	Region 5. Region 7. Northern suburbs of Region 6
Pretoria Central and Old East	East of Kgosi Mampuru Street, but West of the N1 highway. North of the N1, but South of Soutpansberg road.	Region 3 excluding Western section
Pretoria North	North of Soutpansberg, excluding the section West of the M1 (Es'kia Mphahlele Drive) and South of the R80 continuing to the N4.	Region 2. Region 1 excluding South-Western section
Pretoria West	West of the N14, and from city centre the M1 (Es'kia Mphahlele Drive). South of the R80 and N4, North of Voortrekker Road, Hendrik Potgieter Road and the M26.	Region 1 South-West. Region 3 West. Region 4 North-West.
Centurion	South of Voortrekker Road, Hendrik Potgieter Road and the M26. South-West of the R21	Region 6 South and West. Region 4 excluding North-West.

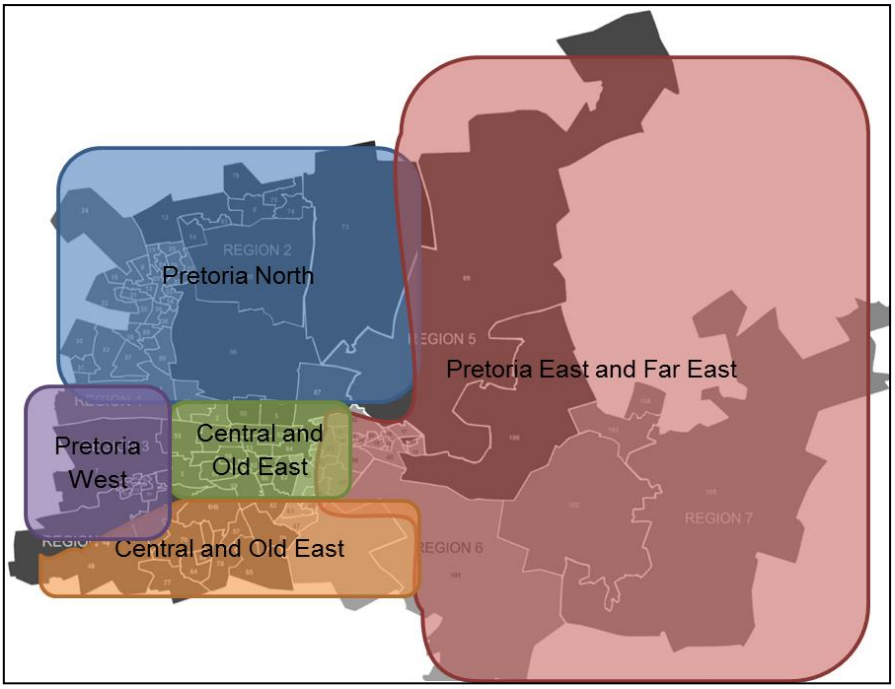

Figure 5: Diagram of study-areas super-imposed on municipal regions

The actual results from the study are further detailed in Table 4, and shows that while the Central/Old East region is the smallest in size, not only do 45% of respondents live in this area, but 75% of respondents work in the area. This shows a trend of commuting from the outer regions of the city towards the city centre for work.

Table 4: Results for respondents living and/or working in category area

Category	Live	Work
Pretoria East and Far East	26%	16%
Pretoria Central and Old East	45%	75%
Pretoria North	20%	2%
Pretoria West	5%	2%
Centurion	4%	4%

Further division was made between the types of neighbourhoods for specific areas of interest. Categories were surrounding rural areas, inner city, townships and suburbs/other.

The type of neighbourhoods can be delineated in approximate regions as shown in Figure 6.

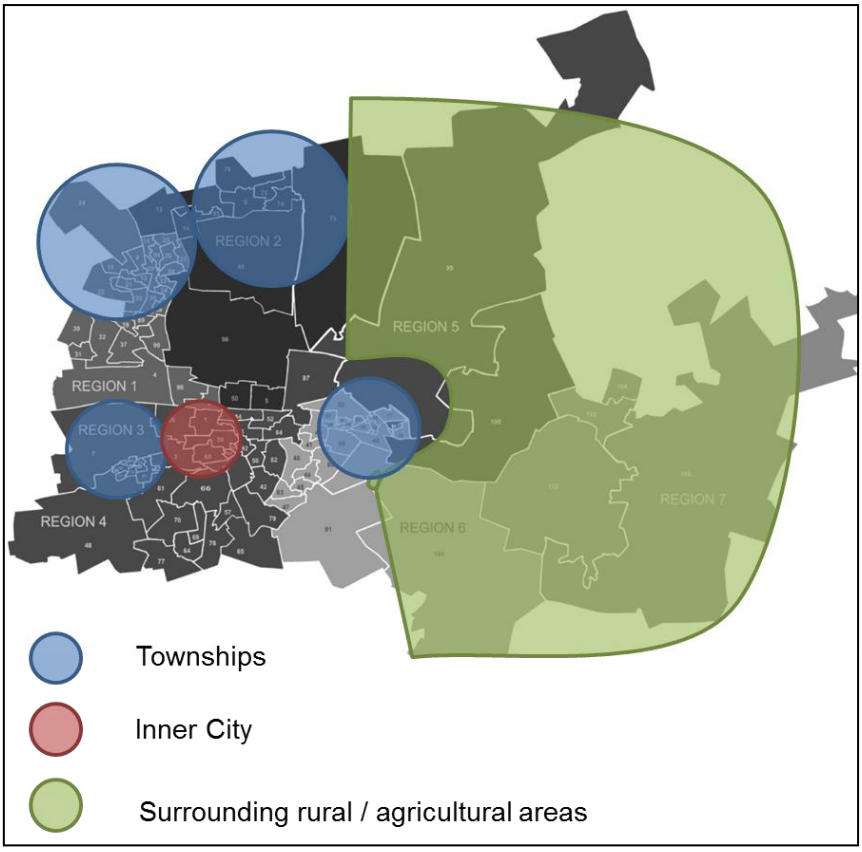

Figure 6: Type of neighbourhoods and approximate location

The actual results from the study are detailed in Table 5. It is indicated that the survey does include a notable amount of responses of people living and/or working in township and inner city areas as well. On the other hand, the survey did not seem to reach many people living and/or working in the rural and/or agricultural areas surrounding the city. For the purposes of this study – where the aim was investigating urban liveability – this is not a problem, as this area is expected to have different concerns from the actual urban areas.

Table 5: Type of neighbourhood of respondents

Category	Live	Work
Townships	30%	3%
Inner City	26%	30%
Surrounding rural / agricultural	0,004%	0%
Suburbs/other	44%	67%

5.2.2 Income class

Whilst it is possible to delineate income classes according to specific income brackets, because the study is focussed a lot on the perception of the respondents, the question was phrased as “Which income class do you best associate with?”

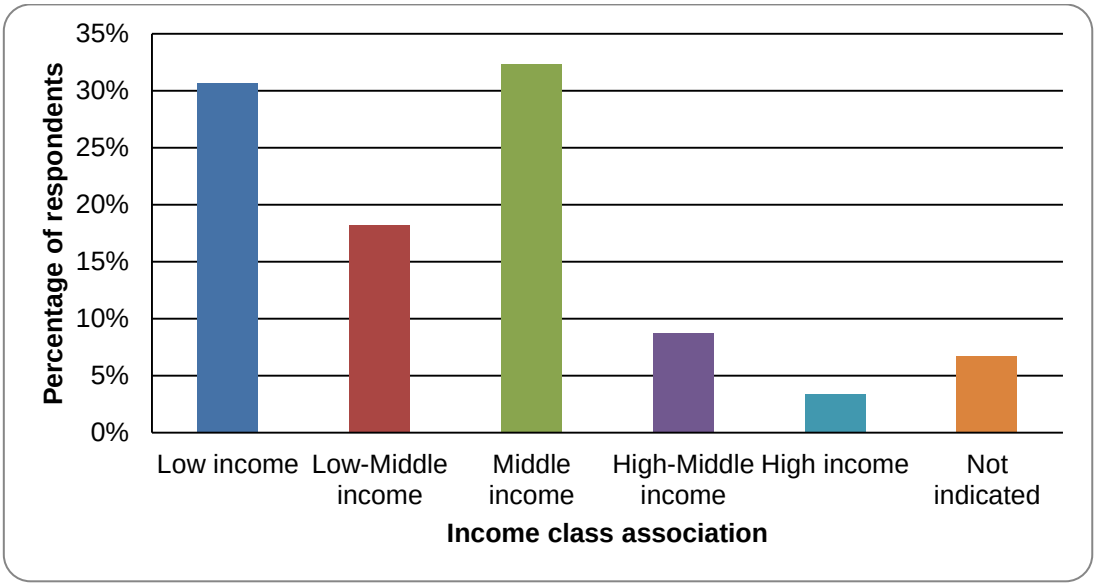

Figure 7: Income class association of respondents

The results as seen in Figure 7 showed respondents across the spectrum, associating with a variety of income classes. The curve of respondents is broadly in line with the population for the city, and indicates fewer respondents with high incomes, and more respondents towards the middle and lower end of the spectrum. Also, 7% of survey respondents chose not to answer this question. It is expected that this is either because they were uncomfortable with disclosing such information, or even because they are currently without income.

5.2.3 Survey distribution

The intent of investigating survey distribution was to determine where respondents were contacted. Categories included:

- Search engine
- From a friend
- Library
- Point of transport (bus station, taxi rank, licensing centre)
- Community Centre
- Social Media
- Other (please specify)

The results from this question did not reflect the location of surveys collected as anticipated. More than half (58%) of respondents indicated “From a Friend” and 16% indicated “Other” specifying “From Researcher” or similar in the description. Many of these responses have data collection logs indicating shopping centres, pedestrian walkways, bus stations, construction sites and libraries as the point of

collection. The question seems to have been unclear. Therefore, respondents rather selected “From a Friend” or “Other” instead of specifying the location.

5.3 Housing

This section of the survey was centred on the experiences of being housed in Pretoria, and housing problems experienced. Questions were also guided towards establishing whether the construction of new buildings is anticipated to be the solution to such housing problems. Preferences for types of buildings, and neighbourhoods for housing interventions were also investigated.

5.3.1 Perception of living in the city

The majority (98%) of respondents answered the question whether Pretoria is a good city to live in when compared to other cities. Of those that answered the question, 90% responded in the positive. There was also an open-ended section where comments or reasons could be given whether Pretoria is or is not a good city to live in. The comments were all perused, and separated into categories within which the comment or reason fell.

For those who responded in the positive – that Pretoria is a good city to live in – the comments received and the percentage thereof showed that the main reasons for the selections were:

- Safety (19%),
- Attractions and opportunities available in the city (19%),
- Services available (15%),
- The cleanliness of the city (13%),
- A positive feeling towards the city (11%), and
- Experience of other people in the city (8%)

Even though there were fewer comments in other categories, it is worth mentioning other categories with multiple respondents:

- The building/people density and not feeling cluttered (5%)
- Climate, weather and the environment (3%)
- Accessibility (3%)
- Monetary concerns – including lower expenses/ cost of living/ higher income (2%)
- Aesthetics and beauty of the city (2%)

Ironically, the same categories can be used to separate the types of negative comments received. Only categories with more than one comment (i.e. more than 7% of negative responses) are indicated.

- Safety concerns (25%)
- Monetary concerns – including higher expenses/ cost of living/ lower income (21%)
- The building/people density and feeling cluttered (18%)
- Services (11%)
- Experience of other people in the city (7%)

This means that safety is the main reason why it is considered a good city to live in and also the main reason why it is *not* considered a good city to live in. It is also worth noting that many of these categories are intangible or subjective concepts that eventually determine someone's opinion of the city. For example, city cleanliness and a general positive feeling towards the city rank higher than the city's accessibility or monetary benefits.

Most of the negative responses came from the low to middle income range, with no negative responses within the high income category respondents. The negative responses never exceeded 17% of the total respondents within an income class.

The open-ended question also asked which cities Pretoria were compared to in the respondent's frame of reference. This was done to determine how many people compared it to local or international cities, and how it compared to other cities that were named most often. However, many respondents (63%) chose to ignore this part of the question, leaving only 37% responses. Because of the low response rate, these results were considered insignificant. This question was also repeated in further sections where the response rate was even lower, therefore, analysis will not be repeated in further sections. Of the remaining 37% respondents, 65% used Johannesburg as a reference and 7% used Cape Town. Only 4% made reference to any international city. Surprisingly, 4% actually made mention of a rural area or town as comparison instead of a city.

5.3.2 Housing problems

With a 96% response rate on the question on whether Pretoria has a housing problem, 60% responded in the positive. This means that 40% of respondents believe that there is not a housing problem. Within different income categories, the lowest ratio was in the high income bracket where the question resulted in 50% either way. The percentage of those who believe there is a housing problem increased with lower income classes with the highest percentage at 66% of the low income class.

When asked whether construction of new residential buildings would address a housing problem in Pretoria 75% of respondents felt that it would. Within this

question there was a big discrepancy between income class and belief that new construction is the answer. Most respondents in low income classes (85%) and those in middle and low-middle income classes (76%) felt that new construction would be the answer. In all three of these classes more people felt that it would be the answer than actually felt that there was a housing problem. Thus, several respondents felt that new housing will be the answer even if they did not believe in the problem. In the high income class 60% of respondents felt that new construction would not be able to alleviate any housing concerns.

5.3.3 Type of new residential buildings

The opinions on the type of housing to be built indicated that low income housing and apartments are most necessary as shown in Figure 8. The majority of respondents that answered within the "Other" category specified that they believe RDP houses are most necessary. As this is technically also housing for low income, this further reinforces the two highest categories. Of respondents that believed that high income homes are required, none fell lower on the income spectrum than high-middle income.

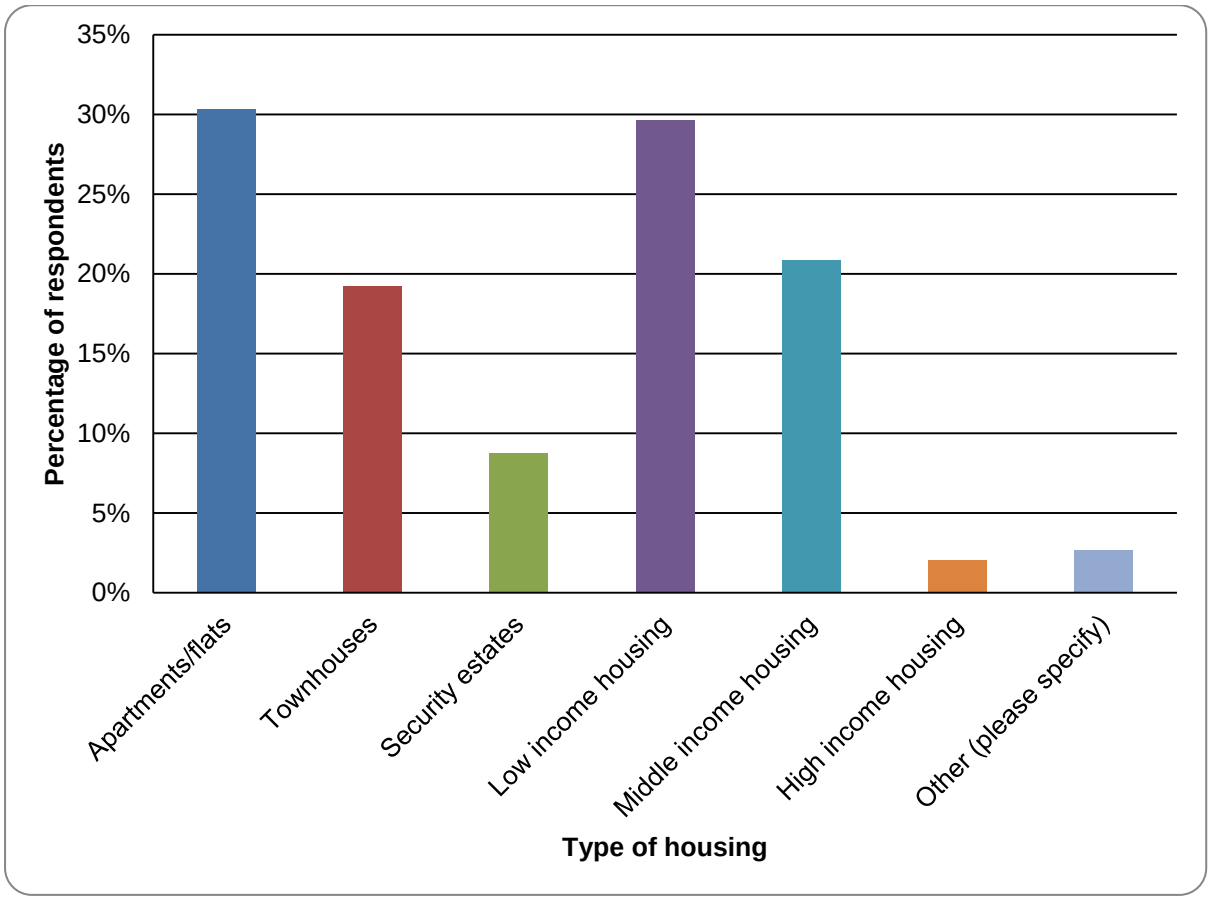

Figure 8: Type of housing that would alleviate housing concerns

In a city with various security estates and security estate construction, it is worth noting that it ranked second lowest of what is believed to be necessary. Even within the high income bracket apartments and flats had more respondents than security estates.

Respondents were also asked whether they would support or live in neighbourhoods where there is a mixture of different income classes and housing types. Of respondents, 84% answered that they would. Only one of the income classes responded in positive with less than 80%, and this was in the high-middle income class with 72%.

5.3.4 Areas for new residential buildings

When asked in which areas these new residential buildings would be most beneficial, the highest scored categories were in the township (38%), inner city (24%) and surrounding rural or agricultural (13%) type of neighbourhood categories. It is worth noting that the townships and surrounding rural and agricultural categories for types of neighbourhoods had been selected a higher number of times than there were respondents living and/or working in such type of neighbourhoods at the time of the survey.

The highest neighbourhood regions were Pretoria East and Far East (14%) and Pretoria Central and Old East (14%). There were no major discrepancies between income classes and their selections of neighbourhoods and type of neighbourhoods. The only exception was the Centurion neighbourhood region which was chosen almost exclusively by middle-income classes. Pretoria North and West were not chosen by high income classes at all.

5.4 Unemployment

This section of the survey was centred on the experiences of people working in Pretoria, and unemployment concerns. Questions were also guided towards establishing whether the construction of new buildings – specifically buildings that can house businesses and in turn job creation (such as industrial, commercial and retail buildings) – are anticipated to be the solution to such unemployment problems. Preferences for types of buildings, and neighbourhoods for such interventions were also considered.

5.4.1 Perception of working in the city

The question regarding unemployment and unemployment concerns in Pretoria was answered by 94% of respondents. Of these, 88% felt that it is a good city to work in. In the open-ended question regarding why it was or was not a good city to work in, the responses were categorised and analysed. Of those who believed that it was a good city to work in, most believed it was due to:

- Job opportunities available in the city (39%)
- Accessibility of and/or transport to work (29%)

Some other categories that received fewer yet noticeable responses include:

- Better job benefits (5%)
- Monetary – including higher pay or lower costs (4%)
- Level of development in the city (4%)
- Experience of people in the city (4%)
- Good safety and security (4%)

Of those that responded in the negative, the highest scoring categories were:

- Not enough jobs (36%)
- Monetary – including lower pay or higher costs (33%)

Other categories mentioned multiple times included:

- Accessibility of and/or transport to work (6%)
- Clutter or density of the city (6%)

It is worth noting that because of a majority positive response, the highest scoring category in the negative responses has similar actual numbers than a moderate to low scoring category in the positive responses.

5.4.2 Unemployment problems

Of all respondents, 83% agreed that Pretoria does have an unemployment problem. There did not seem to be a trend in the income spectrum, as the highest percentage was 100% of high income, whilst low income was the second highest category at 89%. The lowest was high-middle income at 73%.

At 88%, an even higher number of respondents believed that the construction of new industrial, commercial and retail buildings will assist in addressing unemployment. This percentage was only 44% in the high income category, whilst it was highest in the low income and high-middle income categories at 96% each.

5.4.3 Type of new buildings that can house businesses and subsequently create jobs

This question was not posed as an exclusionary question; therefore, multiple options could be selected. There was no significant difference in the type of buildings that are most likely to assist in addressing unemployment as indicated in Figure 9. Whilst it seems that heavy manufacturing (industrial) was the least suggested by respondents it is still fairly close in numbers to the highest suggestions of retail and industrial (warehouses). Notable comments in the "Other" category include construction of Call Centres, and Skills Development Centres.

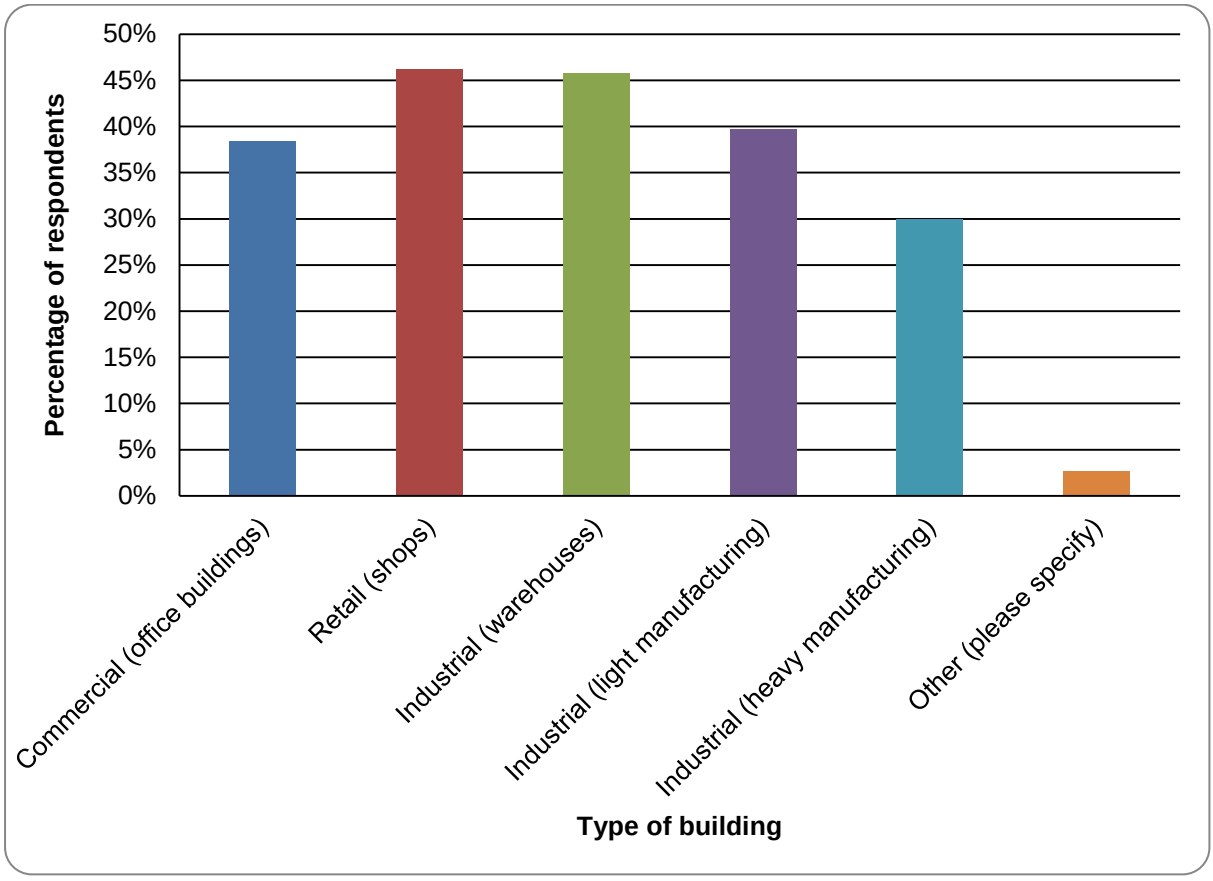

Figure 9: Type of buildings that can assist with creating employment

5.4.4 Areas for new commercial, industrial or retail buildings

The suggestions for the construction of new commercial, industrial and retail buildings were mostly named by types of neighbourhoods, as follows:

- Townships (42%)
- Inner City (29%)
- Surrounding rural/agricultural areas (26%)

The inclusion of surrounding rural and agricultural areas as one of the main suggestions does not necessarily mean that urban sprawl is encouraged by the

citizens. It could indicate the dissatisfaction of the population with commuting to employment in other areas, therefore a suggestion to rather take employment opportunities further from the city centres.
The main neighbourhood regions suggested were:

- Pretoria West (13%)
- Pretoria Central / Old East (12%)
- Pretoria North (12%)

This question was not exclusionary, and respondents could select any combination of areas and/or neighbourhoods as they see fit.

5.5 Health and education

This health and education section looked at the opinions on existing and potential new health and education facilities and interventions offered in the city. Questions were also guided towards establishing whether the construction of new health and education buildings are anticipated to be the solution to problems experienced within both the health and education realm of a society.

5.5.1 Perception of health and education in the city

Of the 93% respondents that answered this section of the survey, 82% felt that Pretoria does have good health and education facilities. This was lowest in the high income type of respondents at 67%, and highest in the middle income bracket at 88%, whilst the low income bracket responded similar to the overall average at 83%. It should be noted that it was possible for respondents to select that Pretoria does have good health and education facilities, but still have negative comments on either or both categories, whilst people answering the original question in the negative did not necessarily have negative comments only.

Of all comments received, more comments focussed on the health component (59%) than the education component (41%). There were also notable differences between positive and negative comments on these areas. Of the comments that mentioned education facilities 91% were positive in nature, and only 9% were negative in nature. Comments that mentioned health facilities – whilst still mainly positive – the positive comment ratio was much lower at 77%.

Based on the comments received, most could be categorised as depicted in Figure 10.

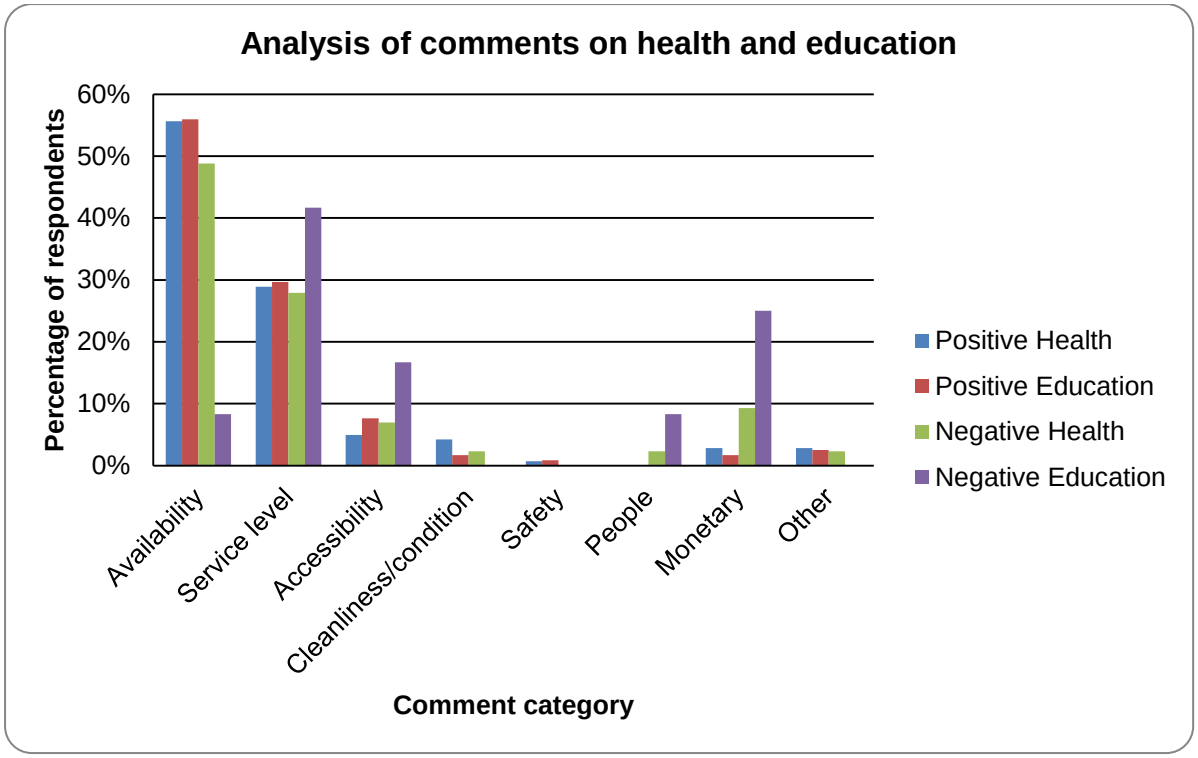

Figure 10: Analysis of comments on health and education

Considering positive comments that praised health and education facilities first, these centred on:

- The availability of health (56%) and education (56%) facilities
- The service levels experienced at health (29%) and education (30%) facilities.
- Access – including transport – to health (5%) and education (8%)

On the other hand, negative comments on education facilities were:

- Service level – including quality of education (42%)
- Monetary concerns – including cost of quality education (25%)
- Accessibility – including transport (17%)

Negative comments for health facilities were very close to the same categories as the positive comments for health:

- Availability of facilities – including restrictions to access in particular areas like townships (49%)
- Service level – including quality of services provided (28%)
- Monetary concerns – including cost of private medical facilities (9%)

5.5.2 Health and education problems

Of 93% respondents that answered the question, 76% believed that there is a need for health and education interventions.

While fewer people responded to the question whether new health and education will address this problem (87% respondents), 80% of these felt that new buildings would be the solution to the problems experienced.

5.5.3 Type of new health and education buildings

When asked what type of buildings are specifically needed, only 8% focussed on only education type of buildings, 42% focussed on only health type buildings, and 50% of respondents indicated both education and health type of buildings. This also totals to 92% respondents who mentioned one or more health buildings, while only 58% of respondents mentioned one or more education type of buildings. The results are also depicted in Figure 11.

The type of building mentioned most was clinics, mentioned by 55% of respondents. The least mentioned health care facility was community wellness centres at 42%. Of the education buildings, primary and tertiary education rated highest at 26% each. These observations were applicable across the spectrum of income classes.

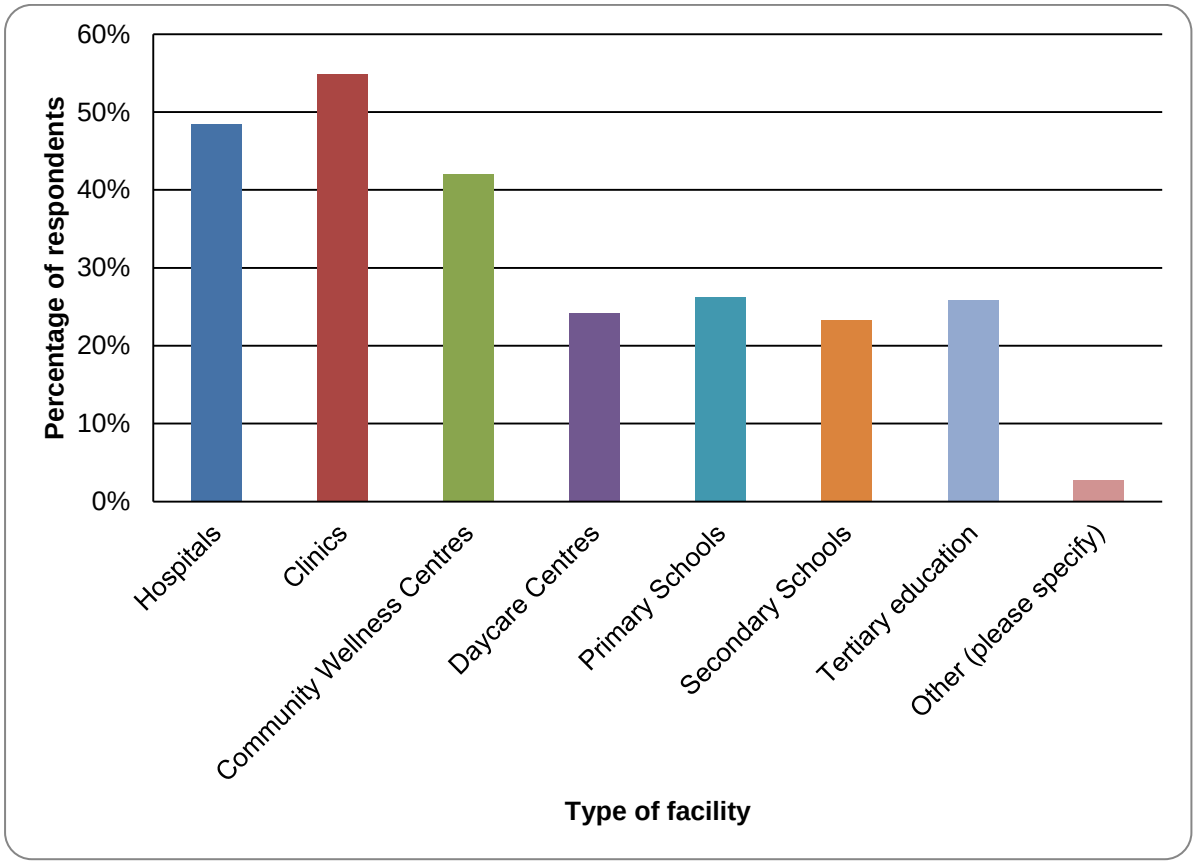

Figure 11: Types of health and education facilities

While there were not many comments in the “Other” category, the most applicable comments mentioned care facilities for specific ailments such as Alzheimer’s and dementia, as well as affordability and improvement of existing facilities.

5.5.4 Areas for new health and education buildings

The responses were mainly focussed on the type of area for such buildings. According to respondents, these buildings would be most beneficial in townships (59%). A total of 31% respondents felt that the inner city is in need of these types of buildings, and 26% believed that this should be done in surrounding rural and agricultural areas.

Of the possibilities of specific neighbourhood regions, the most mentioned was Pretoria West (15%) followed by Pretoria Central (13%), Pretoria East and Far East (12%) and Pretoria North (12%).

5.6 Service provision

The service provision section focusses on the provision of services to the community – this excludes transport and accessibility which is dealt with in a separate section.

5.6.1 Perception of service provision in the city

Of 93% respondents that responded to this question, 76% felt that Pretoria does have good service provision. This was highest in the low-middle income category at 82%, and lowest in the high income category at 67%. The other income classes were all between 74%-76%.

Of the positive comments received, they can be mostly categorised as:

- Overall good provision and distribution of services (57%)
- Services in good, clean condition (13%)
- Services provision being managed well (12%)
- Services provided and/or repaired in a timely manner (7%)
- Services being maintained well (7%)

Of the negative comments received, the categories mostly centred on:

- Overall provision of services inadequate (38%)
- Service provision not well distributed or reaching all areas (25%)
- Services not well maintained (13%) and provision not well managed (7%)

Other negative comments while small in number included timeliness of provision and repairs (4%), cost of services (2%) and bad cleanliness and existing services condition (2%).

5.6.2 Service provision problems

The majority, 75%, of respondents believed that there is a need for services (such as water reticulation, sewage services and waste removal) in Pretoria. This was highest amongst high income respondents (89%) and lowest with low-middle income respondents (67%).

On the other hand, 85% of respondents felt that construction of new services (such as laying water pipes, expanding sewage networks, and new landfills and recycling facilities) will address this problem. More respondents felt that new service construction would be the solution than those that felt there is a service provision problem.

5.6.3 Type of new service provision most required

In a selection of which type of services are specifically needed, all options were fairly close to one another and are distributed as follows:

- Water provision – water to homes (43%)
- Sewerage – toilets and waste water removal (47%)
- Solid waste removal – dustbins, landfills and recycling areas (45%)
- Telecommunication services – telephone lines and wireless internet (35%)

Across the income classes for water provision all ranged from 40% to 50% with no trend on the spectrum. For solid waste removal this ranged from 41% to 54% with no trend across the spectrum. On the other hand, sewerage provision was lowest in high income class (30%) while all other classes were between 44-52%. For telecommunication services, this was highest in the high income class (70%) with a trend in the percentages decreasing steadily across the spectrum to only 25% of low income respondents.

Of the comments in the “Other” section, while small in number, the topics mentioned include:

- Electricity provision
- Libraries and library hours
- Sports facilities
- Policing

5.6.4 Areas for new service provision

More respondents reacted to the types of areas that require these services, as follows:

- Townships (55%)
- Inner city (31%)
- Surrounding rural and agricultural areas (25%)

Of respondents that mentioned specific neighbourhoods, again while smaller in number than the area, types are as follows:

- Pretoria West (14%)
- Pretoria Central and Old East (13%)
- Pretoria East and Far East (13%)
- Pretoria North (13%)

5.7 Transport and accessibility

The transport and accessibility section focussed specifically on how respondents experienced movement in and around the city. Public and private transport modes as well as motorised and non-motorised forms of transport were considered. The intention was not to analyse each form of transport individually, but to get an overall view of how accessible respondents found the city.

5.7.1 Perception of transport and accessibility in the city

Of the 94% of respondents that chose to answer this question, 80% believed that Pretoria has good transport infrastructure. This was all fairly similar between low income and high-middle income classes, with 75-85% between categories. High income class however only had 44% responding in the positive.

Positive comments on the transportation can be categorised as follows:

- Availability of transport systems (34%)
- Alternatives and different options of transportation modes (32%)
- Condition of transport and maintenance thereof (15%)
- Accessibility of transportation systems (7%)
- Low cost of transport (5%)

Negative comments on transportation in Pretoria were stipulated as:

- The limited extent of routes and poor route networks (26%)
- The service experienced in transportation – including timeliness, reliability, safety and service interruptions (19%)

- Crowding on public transport and traffic congestion on road networks (16%)
- Availability of transport systems (10%)

Lesser mentioned negative comments include alternatives and different options (9%), cost of transport (9%), transportation system (9%)

5.7.2 Transport and accessibility problems

Of the 90% respondents that chose to answer this section, only 63% of respondents felt that there is a need for better transport in Pretoria. This was highest in high-middle income (76%) and high income (78%) categories and lowest in the middle income (60%) and low income (62%) categories.

A majority, 73%, of the respondents felt that new transport infrastructure would address problems experienced. However, only 78% of the total number of respondents chose to answer this question, resulting in an equal number of respondents feeling that there should be better transport and the number of respondents feeling that new transport will be the solution.

5.7.3 Type of new transport infrastructure

Of the options given regarding which type of transport infrastructure is specifically required, the top selections by respondents were:

- More lanes added to existing roads (40%)
- New roads to be built (34%)
- Pedestrian walkways (31%)
- Railway and train stops (29%)
- Cycling lanes (28%)

The only option that was not selected as often is tram lines and tram stops (13%). Across all selections, the lowest percentages were in the lower income category, which then gradually increased to higher percentages in higher income categories.

Notable comments in the “Other” category include:

- Expansion of bus service routes and more bus stops
- More taxis and lanes for exclusive taxi usage
- Upgrade and maintenance of roads – especially in townships
- Better safety in transport systems

5.7.4 Areas for new transport infrastructure

Types of areas where new transport infrastructure was suggested to be located were:

- Townships (42%)
- Inner city (37%)
- Surrounding rural and agricultural areas (17%)

Whereas specific regions for such infrastructure were:

- Pretoria East and Far East (18%)
- Pretoria Central and Old East (16%)
- Pretoria North (13%)

5.8 Overall comments

The overall comments section aimed to consolidate the whole study, as well as provide a space for respondents to give their opinions without being guided by specific topics or lines of questioning. Questions asked firstly whether new construction is the best solution to these problems. Why construction should or should not be considered the best solution, suggestions of other actions to address the problems discussed, and suggestions for other actions that could be taken to make Pretoria a better city to live in were all left as open-ended question. As a final open-ended question respondents were also invited to give any further opinions on liveability, socio-economic concerns, Pretoria and the survey itself.

5.8.1 New construction as solution

At one of the lowest response rates, only 79% answered the final section of the survey. Of this, only 70% felt that construction was the best solution, so in total only 56% of total respondents believed construction to be the best solution to address socio-economic concerns.

However, it was also observed that some of the respondents that answered the overall question in the negative answered this same question in the positive when it related to individual sections, and vice versa. It was therefore investigated whether there was a relation between construction in individual sections and the overall section. This relation can be analysed as follows:

- 23% of respondents answered the overall question as well as all of the individual sections in the positive
- 24% of respondents answered the overall question as well as the majority of individual sections in the positive

- 8% of respondents responded in the positive to the overall question, but only to a minority of other sections (only one or two of the five individual sections)
- 11% of respondents did not respond to the overall question or responded in negative, but responded to all individual sections in positive
- 15% of respondents did not respond to the overall question or responded in the negative, but responded to the majority of individual sections in the positive
- 19% of respondents did not respond to the overall question or responded in the negative, but also responded in negative to the majority of the individual sections.

This shows that many respondents regarded each individual section on its individual merits, and that while construction may be the solution in some instances, in other instances there are maybe other options.

5.8.2 Construction related overall comments

Overall, in open-ended questions, various comments still made reference to construction – regarding whether they believed it was or was not the solution. However, in an instance where the comments were not guided by a topic it was interesting to take note of which categories were mentioned. 55% of respondents gave overall comments that were construction-related.

These construction-related comments were analysed in categories according to the topic of construction discussed as shown in Figure 12. The highest portion referenced unemployment and how it is anticipated that construction could create unemployment. This indicates that unemployment is the socio-economic category that weighs strongest in 36% of the participants' unguided comments. Other categories with a high number of mentions include Transport (16%) and Service Provision (15%) all of these top three comments were categories that were represented within the survey as well. Quality of life and the belief that construction will improve quality of life is at 8% the highest ranking category that did not form part of this study, while others cite advancing development (4%) as one of the best reasons for construction.

The lowest scoring categories that formed part of the survey were Housing (9%) and Health and Education (6%).

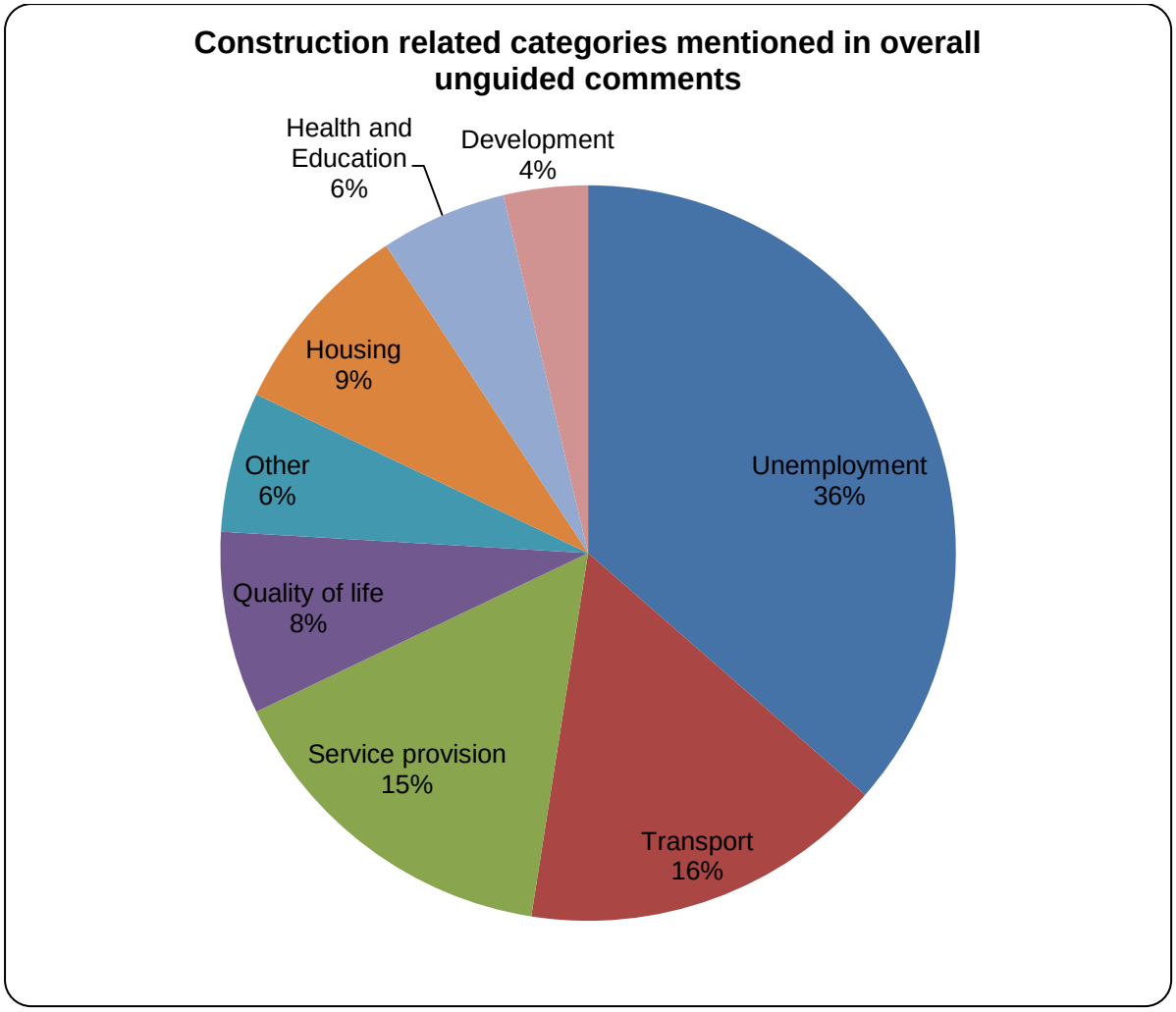

Figure 12: Construction related categories mentioned in overall unguided comments

While this ranking does not necessarily reflect the importance of the specific socio-economic liveability aspects within Pretoria, it does indicate which aspects are at the forefront of the thoughts of citizens.

There seems to be no significant indication that the location of a category within the survey will influence whether it is discussed in the unguided comments. For example, unemployment was the second category discussed, while transport was only discussed as the last category.

5.8.3 Non-construction related overall comments

Many comments – 42% of total respondents – referenced solutions other than construction that could improve the liveability of the city as well as the socio-economic concerns. These are in some instances a replacement for construction, while it is a total separate suggestion in other instances. The data of these responses are shown in Figure 13 as well.

The most mentioned alternative suggestion was concerned with safety, and crime levels. Some of non-construction related comments, 26%, made suggestions for better policing. These comments suggested better and/or more police patrols and overall suggested that crime rates are a big concern and that efforts should be made to lower them drastically.

Of the non-construction related comments, 8% suggested using existing facilities as is rather than new construction. A further 15% suggested that existing buildings can be used, but should rather be upgraded and renovated instead of simply building new buildings. An additional 8% mentioned that it was a necessity that any new and existing buildings and services be better maintained to prevent the necessity of constantly having to renovate and/redo projects.

Of the non-construction comments another 14% were aimed at bettering systems in the city. These comments covered a wide range of topics, but all called for some improvements in existing systems or suggested development of better systems. Some topics included:

- Job creation and skills development systems
- Public transport systems
- Urban planning, building approvals and building inspections
- Systems and/or policies for relevant socio-political issues such as affordable education and redistribution of land.

The 13% of comments that called for better management include everything from better management of the roll-out of service provision, management of public transport, management of projects that could possibly entail new buildings and management of public programmes that area geared towards employment creation and/or skills development. This also included comments regarding ending corruption.

Ten percent (10%) of non-construction comments requested more involvement from the communities. Some of these welcomed the survey as a platform to engage in data-collection, while others simply requested that they be engaged and included in decision-making processes.

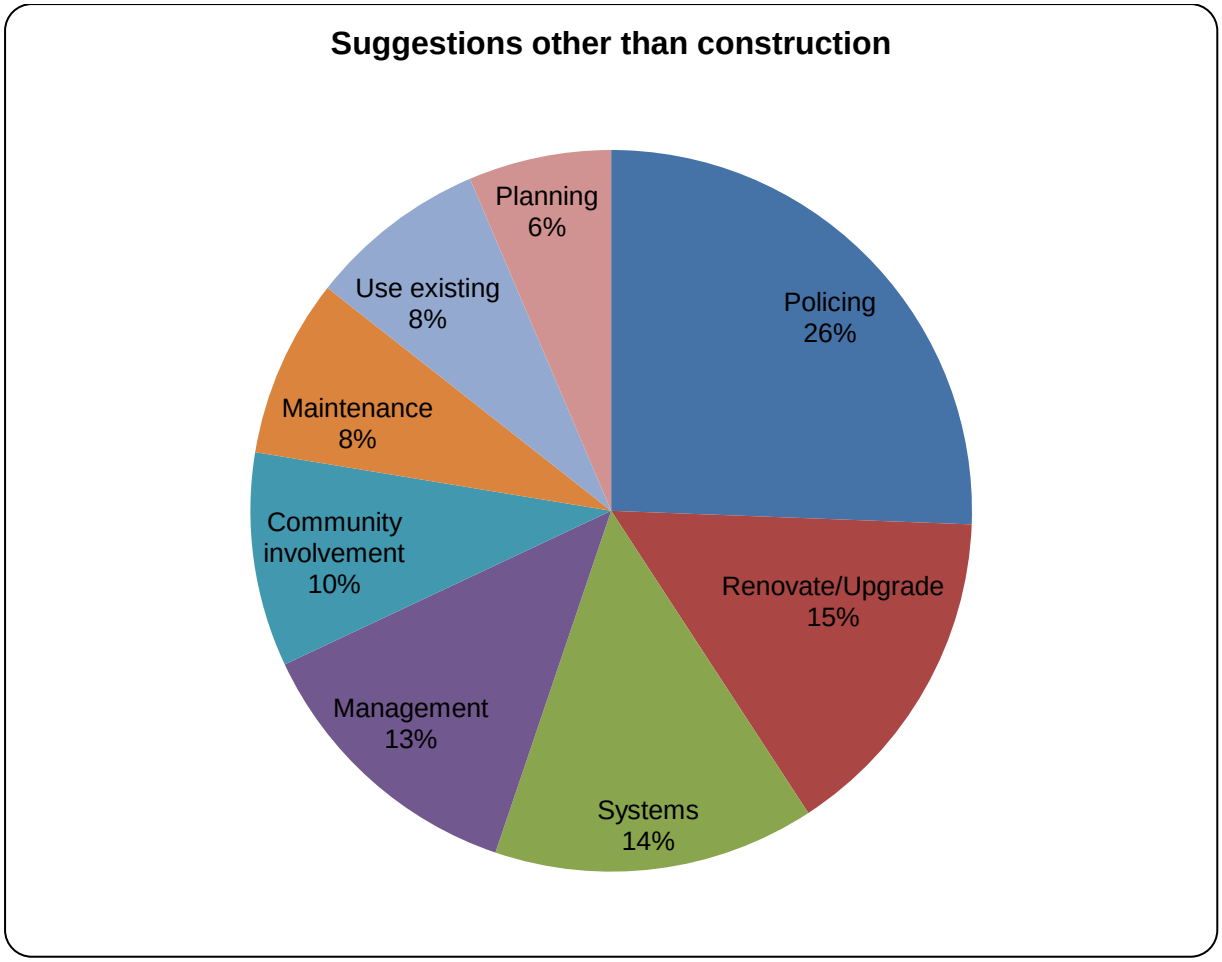

Figure 13: Suggestions other than construction

5.8.4 Areas of new construction

There was no overall comment regarding the location of the construction or non-construction related interventions. However, the biases of respondents towards the areas where they live and work themselves were considered. Some bias is to be expected – since it is anticipated that people are more familiar with concerns in their own area-types and regions. However, ideally, the respondent would consider the merit of the case and the cause of the collective citizen, not only form opinions based on familiarity and individual bias.

Only 4% of respondents were considered to be highly biased to their own areas and type of areas. These respondents chose area-suggestions within questions with the same type of area and region in almost all categories.

Some bias was shown by 21% of respondents by choosing their own regions and type of areas in various categories, but also selecting other area types and or regions in other instances. Low bias was shown by 47% that selected their own regions or type of area in a few instances.

No bias was shown towards their own regions and type of areas by 28% of respondents – they did not select their own places of residence or work in any of the instances. This could indicate anticipation that socio-economic concerns for the city are wider than their own experiences.

6 Discussion and conclusion

6.1 Discussion

With the statistical analysis used to determine a factor of discrepancy, the research can be expected to be a reliable representation of what similar studies with the same parameters would produce. While some sub-questions had a more positive outcome than others, all sub-questions as well as the main question have indicated a positive outcome, even with adjustments to make the sample representative of the population. Respondents were selected at random and represented a variety of income-classes and locations within Pretoria. Any biases were investigated in the results, and if present, form part of the limitations of the study.

The study question has been an investigation of interest, specifically within the contextual parameters of the study undertaken. Urban liveability is not always a tangible or measureable concept, and the scope of a study had to be clear to enable exploration. In this case, the study focused on Pretoria, South Africa. As a location, this has resulted in the scope focussing on concerns that would be applicable to an urban environment in a developing African country. In order to consider socio-economic concerns in the light of urban liveability, these concerns had to provide a link between the physical and psychological experience thereof. The socio-economic concerns had been selected based on whether it could be connected to a perceived new construction implication.

It is understood that there have been other studies on the urban liveability in the Pretoria region specifically done for and within the City of Tshwane Metropolitan Municipality. However, these are not available in the public domain and are protected by non-disclosure agreements. In addition, it is understood that none of these studies focused specifically on the impacts of new buildings on the socio-economic aspects of urban liveability. Based on a shortage of research in this specific context, the City of Tshwane Metropolitan Municipality has indicated their interest in the outcome of this study. The outcomes could hopefully assist in guiding development and planning departments in the area to better understand how citizens relate to their urban environment and new buildings in particular. For this to be possible, the qualitative responses and analyses are as important as the accepting and rejecting of hypotheses. Some of the qualitative responses hinted not only at the subject matter under investigation, but also at limitations of the study and possible future research.

The results to qualitative questions and comments cannot be statistically significant due to the wide range of responses that could be given, the nature of urban liveability being impacted by personal opinions, and the small number of such

responses in relation to a large population size. However, the qualitative information received does complete the full picture of the study and has revealed some interesting qualitative information that includes:

- Respondents selected townships and inner city in all research sub-questions as the areas that most require new construction. These types of areas were more often selected than the suburbs or areas where respondents live and/or work themselves, and bias calculations have indicated that few respondents were biased towards their own areas in their answers. This has hinted that regardless of the respondent's own place of living and working, they either feel the socio-economic needs in these areas are greatest, or that construction as solution is specifically applicable to these areas.
- In the final section of the questionnaire where questions were mostly unguided, it has been indicated that the majority of comments that mentioned socio-economic concerns highlighted unemployment, transport, and service provision. These were not the first or last concerns addressed in the questionnaires, so it is expected that it is not simply because it was the respondent's first opinion or last guided thoughts. It could be argued that this indicates that these socio-economic concerns weighed heaviest on the respondents' minds.
- In the final unguided section, many suggestions have been made on how to address socio-economic concerns that can be considered alternatives to construction or necessary interventions in conjunction with the construction. These include strong concerns about crime and safety, as well as many comments about utilising existing buildings including using empty buildings, upgrading and/or renovating as well as better maintenance. Further suggestions were made to improve systems and management of socio-economic concerns and/or new construction. There was also a plea for constant involvement of citizens and communities, and the study has been appreciated for providing a platform to do so.
- Comments indicating why Pretoria is or is not a good place to live, have most commonly indicated good safety, availability of attractions and opportunities, good services and cleanliness where positive, and poor safety or high expenses where negative.
- Comments regarding why Pretoria is or is not a good city to work in have praised the availability of job opportunities and the accessibility or transport options available, while criticising that there are still not enough jobs and low salaries or wages. Questions have also been raised regarding insufficient skills development programmes that could boost employment, as well as suggestions for the construction of high-density employment opportunity buildings like call centres.
- Health and education comments were positive regarding the availability of such services and the service levels experienced. For health services the majority of negative comments entailed availability and service levels as well.

This once again shows the subjectivity of liveability. For education, the negatives were service levels and high costs in relation to quality of education. In addition, many comments and suggestions have been made on the improvement of existing facilities as opposed to new construction.

- Comments on Pretoria's service provision have indicated the provision and distribution of services as mainly positives while the inadequacy of the service provision and the fact that it does not reach or is not of the same quality in all areas have been indicated as most common negatives. Suggestions were also made that service provision should have included aspects like electricity, libraries, sports facilities and policing.
- Transport and accessibility within Pretoria has been mostly praised through the availability thereof and the alternative modes of transport available. The negative comments have focussed on the limited extent of transportation networks as well as the reliability of public transport (including timeliness, reliability and safety). Many further comments have questioned the exclusion of buses, and highlighted the concerns with taxis.

From these qualitative comments the limitations of the study became even more apparent. Some of these were expected and were explicitly excluded through the scope of the study, while others have indicated unanticipated weaknesses. Some limitations include:

- Crime and violence has been identified as a big concern in Pretoria from the outset. It has been excluded because contrary to the other socio-economic concerns the problem is not expected to be able to be addressed by new construction. However, safety and concerns with inadequate policing and handling of crime was still mentioned by respondents throughout the study at various other points in socio-economic concerns. This shows that the study could have benefitted from acknowledging the importance of crime not only as stand-alone socio-economic concern, but also as a concern linked with other issues like employment, transport etc.
- The study was limited to the geographical area of Pretoria, South Africa. Results have indicated that although attempts have been made to ensure representation throughout the entire area, there have been areas with very few respondents. This included Centurion where more care could have been taken to distribute in this area specifically. Representation from the other geographical locations and all income classes were a fair mix.
- The study has focussed on urban areas and the liveability therein, similar studies in a rural and agricultural setting are expected to be centred on different concerns and yield different results. On the other hand, this limitation means that a very low representation received from the surrounding rural and agricultural areas has not been considered to be a big concern to the study, as the study specifically focussed on urban liveability,

and it is anticipated that rural and agricultural areas have different liveability concerns to urban areas

- The study has concentrated on new construction in addressing socio-economic concerns. No mention was made on using existing buildings, upgrading and renovating existing buildings and maintaining existing buildings. These could be considered preferable alternatives to new construction due to being much cheaper, easier on the environment, and preserving existing urban environments. While this was outside the scope of the study, it has been mentioned by respondents, and in some cases influenced responses to the answers.
- The study did not intend to develop a practical solution to the problem. However, respondents throughout the study have mentioned some possible solutions and suggestions. Some have stayed within the scope of the study while others ventured to alternative suggestions.
- Urban liveability is influenced not only by the respondents to a study, but also the person conducting research and how the research is structured. Some limitations in the form of bias can be expected in the choice of scope as well as analysis of information.
- The questionnaire had a question attempting to find out where the majority of respondents were contacted. Due to ambiguity of the question and misunderstanding by respondents, the majority failed to indicate the physical location of where they were contacted and chose the option that was closest to “being handed a questionnaire”.
- Some suggestions in the qualitative analysis indicated accidental exclusions that could have formed part of the study, such as electricity in the service provision section, buses and taxis in the transport section and skills development programmes as part of the unemployment or health and education section.
- No analysis was done on the race, culture, gender or political affiliations of the respondents to the questionnaire.

Recommendations for future and further research can be deduced from the limitations of this study. Urban liveability is a subject matter that can benefit from more research, specifically within African and developing contexts. Some suggestions for future research:

- A more extensive study with more respondents on the same subject could enable deeper analysis of the distribution of liveability perceptions in different groups of people.
- This study focussed only on socio-economic aspects of urban liveability, whilst intangibles and environmental aspects form an equal part of urban liveability. Research on environmental or intangibles either as a stand-alone or in conjunction with this research could be beneficial.

- The study could be duplicated or adapted to rural and agricultural liveability in non-urban settings as well.
- The impact of crime on urban liveability, especially within the South African context, this could be a beneficial study. It could look at the correlation of perceptions of crime as opposed to crime statistics in an area, or even extend as far as understanding which interventions are successfully perceived and if the public have improvement suggestions.
- It could be interesting to conduct a comparative liveability study between different urban areas. This could be between regions within the same urban area, between different urban areas in South Africa, or between comparable developing and developed urban settings.
- Further research could be done on the options, feasibility, perception and practicality of utilising, upgrading, changing, renovating, maintaining and managing existing buildings and services as opposed to new construction.
- Research could be done to source possibilities for potential practicable solutions which lead up to pilot projects and implementation.
- It is further suggested that accidental exclusions in the questionnaire, as discussed in the limitations of this study, be addressed and included in further research.
- Additional demographical factors such as age, race, culture, gender or political affiliations can form part of the analysis of future research.

6.2 Conclusion

The aim of the study has been to confirm whether new construction is perceived to have a positive impact on socio-economic aspects of urban liveability.

Each socio-economic concern and its related construction has been considered a separate research sub-problem. Full analysis was done regarding the qualitative comments provided during the study.

- The impact of new residential construction on housing as a socio-economic concern can be considered positive. Statistical analysis has indicated that 69.6 - 80.2% of the population can be expected to believe that the construction of new residential buildings will have a positive impact on housing concerns in the city. The study has also found that 90% of respondents already found it a good city to live in and 84% of respondents would support a development with a mix of income classes and buildings.
- The majority (83.8 - 91.7%) of the population can be expected to indicate that new industrial commercial and retail buildings will have a positive impact on unemployment, despite 88% of respondents already having indicated that it can be considered a good city to work.

- Population-wide, it can be expected that 75.4 - 85.1% are likely to believe that new health and education facilities will solve health and education concerns. A total of 82% of respondents indicated that health and education provision is good.
- The majority (80.1 - 89.1%) of the population of Pretoria are expected to agree that construction of new services will have a positive impact on concerns regarding services like water, sewage, waste removal and telecommunications. Only 76% of respondents believe the current provision is good.
- New transport construction is likely to be having a positive impact on accessibility concerns for 67.3 - 78.7% of the population. Of the respondents, 80% already felt that the city had good transport and accessibility.

Overall, 64.4 - 76.1% of the population are likely to believe that new construction will have a positive impact on the socio-economic concerns in the area.

While this study has aimed to fill gaps in existing literature and has attempted to provide useful data in understanding liveability, socio-economic concerns and the perceptions of the citizens of Pretoria, there is still much that can be investigated further. Hopefully this study can reveal the subject matter to others so that they are not only able be mindful to these concepts and concerns, but to also inspire curiosity to know more and to encourage innovation of solutions.

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8 Appendices

8.1 Appendix A – Questionnaire

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

URBAN LIVEABILITY AND SOCIO-ECONOMIC CONCERNS IN PRETORIA

Thank you for participating in our survey!

The survey is interested in your **personal opinions** living and/or working in Pretoria (South Africa). You are expected to answer based on your own opinions and experiences and don't need professional expertise.

The majority of questions have multiple choice or "yes/no" answers to assist you and to save time.
Your discussions can be as brief or detailed as you feel necessary.
If you have anything else to discuss or add, please use the space on the last section of the survey

The results from this survey will contribute to MSc Geography research at the University of Pretoria, and is supported by the City of Tshwane Municipality
All responses will remain confidential and anonymous in any publications resulting from the research

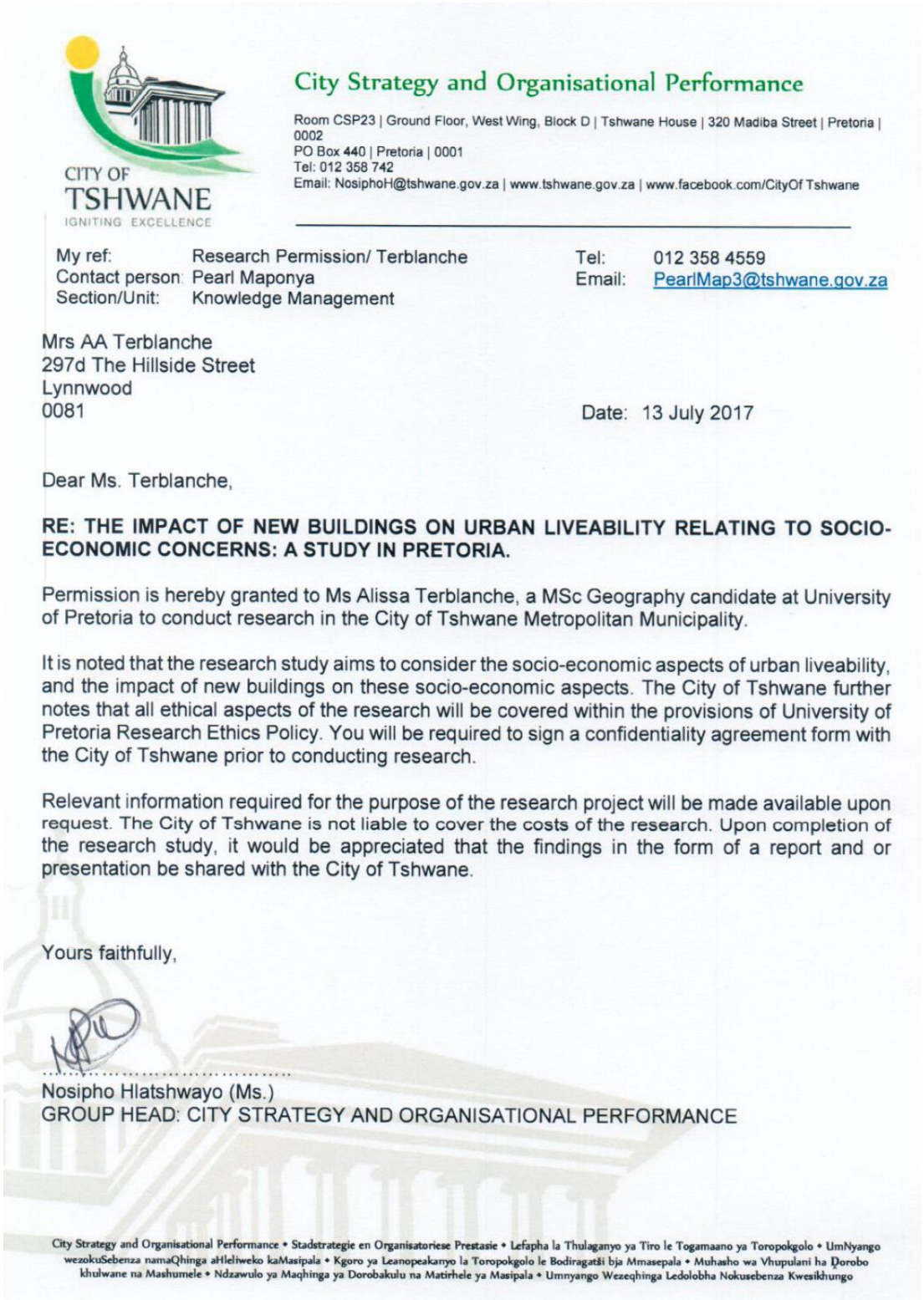
* Types of questions:

Select any applicable answers: Shown as cells of light grey
Select only "Yes" or "No": Shown as cells of medium grey
Optional open-ended questions to elaborate on choices if necessary: Shown as white

General					
1	Which area or neighbourhood in Pretoria are you from (live and/or work)?	Live			
		Work			
2	Which income class do you best associate with: *select applicable	Low income	Low-Middle income	Middle income	
		High-Middle income	High income		
3	Where did you find out about this survey?	Search engine	Friend	Library	Point of transport (bus, taxi rank or
		Social Media	Community Centre	Other	
Housing					
Please answer these questions abouth your personal subjective opinions regarding housing in Pretoria. No professional expertise is required.					
4	Compared to other cities, is Pretoria a good city to live in?	Yes		No	
5	Briefly elaborate on your answer: Why is/isn't Pretoria a good city to live in? Which cities did you compare it to?				
6	Does Pretoria have a housing problem?	Yes		No	
7	Will building new residential buildings address this problem?	Yes		No	
8	What type of housing should be built:	Apartments/Flats	Townhouses	Low income	Middle income
		Security estate	High income	Other	
9	Will you be willing to live in/support neighbourhoods with a mix of income classes and housing types?	Yes		No	
10	In which area or neighbourhood would these buildings be most beneficial?	Inner City	Townships	Pretoria East / Far East	Pretoria Central / Old East
		Pretoria North	Pretoria West	Centurion	Surrounding rural areas
		Agricultural areas	Specific neighbourhoods / municipal regions (please		Other (please specify)
Unemployment					
Please answer these questions abouth your personal subjective opinions regarding unemployment in Pretoria. No professional expertise is required.					
11	Compared to other cities, is Pretoria a good city to work in?	Yes		No	
12	Briefly elaborate on your answer: Why is/isn't Pretoria a good city to work in? Which cities did you compare it to?				
13	Does Pretoria have an unemployment problem?	Yes		No	
14	Will new industrial, commercial and retail buildings in Pretoria address this problem?	Yes		No	
15	Which type of buildings will create employment: *select all applicable	Commercial (offices)	Retail (shops)	Industrial (warehouses)	Industrial (light manufacturing)
		Industrial (heavy manufacturing)	Other		
16	In which area or neighbourhood would these buildings be most beneficial?	Inner City	Townships	Pretoria East / Far East	Pretoria Central / Old East
		Pretoria North	Pretoria West	Centurion	Surrounding rural areas
		Agricultural areas	Specific neighbourhoods / municipal regions (please		Other (please specify)

Health and Education					
Please answer these questions abouth your personal subjective opinions regarding health and education in Pretoria. No professional expertise is required.					
17	Compared to other cities, does Pretoria provide good health and education services?	Yes		No	
18	Briefly elaborate on your answer: Why does/doesn't Pretoria provide good health and education services? Which cities did you compare it to?				
19	Is there a need for health and education interventions in Pretoria?	Yes		No	
20	Will new health buildings and educational facilities address this problem?	Yes		No	
21	What type of facilities are specifically needed: *select all applicable	Hospitals	Clinics	Community Wellness	Daycare Centres
		Primary education	Secondary education	Tertiary education	Other (please specify)
22	In which area or neighbourhood would these buildings be most beneficial?	Inner City	Townships	Pretoria East / Far East	Pretoria Central / Old East
		Pretoria North	Pretoria West	Centurion	Surrounding rural areas
		Agricultural areas	Specific neighbourhoods / municipal regions (please		Other (please specify)
Service Provision					
Please answer these questions abouth your personal subjective opinions regarding service provision in Pretoria. No professional expertise is required.					
23	Compared to other cities, does Pretoria have good service provision?	Yes		No	
24	Briefly elaborate on your answer: Why does/doesn't Pretoria have good service provision? Which cities did you compare it to?				
25	Is there a need for services (water reticulation, sewage services, waste removal) in Pretoria?	Yes		No	
26	Will new service construction (laying water pipes, expanding the sewage network, new landfills and recycling facilities) address this problem?	Yes		No	
27	Which services specifically: *select all applicable	Water provision (water to homes)	Sewerage (Toilets, waste water removal)	Solid waste removal (Dustbins, landfills, recycling areas)	Telecommunication services (telephone lines and wireless internet)
		Other (please specify)			
28	In which area or neighbourhood would this service infrastructure be most beneficial?	Inner City	Townships	Pretoria East / Far East	Pretoria Central / Old East
		Pretoria North	Pretoria West	Centurion	Surrounding rural areas
		Agricultural areas	Specific neighbourhoods / municipal regions (please		Other (please specify)
Transport and Accessibility					
Please answer these questions abouth your personal subjective opinions regarding transport in Pretoria. No professional expertise is required.					
29	Compared to other cities, does Pretoria have good transport infrastructure?	Yes		No	
30	Briefly elaborate on your answer: Why does/doesn't Pretoria have good transport infrastructure? Which cities did you compare it to?				
31	Is there a need for better transport infrastructure in Pretoria?	Yes		No	
32	Will new transport infrastructure address this problem?	Yes		No	
33	Which services specifically: *select all applicable	New roads	More lanes to existing roads	Pedestrian Walkways	Cycling Lanes
		Railways and train stops	Tram lines and tram stops	Other (please specify)	
34	In which area or neighbourhood would this transport infrastructure be most beneficial?	Inner City	Townships	Pretoria East / Far East	Pretoria Central / Old East
		Pretoria North	Pretoria West	Centurion	Surrounding rural areas
		Agricultural areas	Specific neighbourhoods / municipal regions (please		Other (please specify)
Overall and comments					
35	Is new construction the best way to address these concerns?	Yes		No	
36	Please Explain why you consider new construction the best way or what other solutions can be considered:				
37	Please explain what other actions can be taken to make Pretoria a better city to live in:				
38	Do you have any further comments (regarding liveability, socio-economic concerns, Pretoria, or this survey)				

8.2 Appendix B – City of Tshwane Metropolitan Municipality's letter of approval



CITY OF TSHWANE
IGNITING EXCELLENCE

City Strategy and Organisational Performance

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My ref: Research Permission/ Terblanche
Contact person: Pearl Maponya
Section/Unit: Knowledge Management

Tel: 012 358 4559
Email: PearlMap3@tshwane.gov.za

Mrs AA Terblanche
297d The Hillside Street
Lynnwood
0081

Date: 13 July 2017

Dear Ms. Terblanche,

RE: THE IMPACT OF NEW BUILDINGS ON URBAN LIVEABILITY RELATING TO SOCIO-ECONOMIC CONCERNS: A STUDY IN PRETORIA.

Permission is hereby granted to Ms Alissa Terblanche, a MSc Geography candidate at University of Pretoria to conduct research in the City of Tshwane Metropolitan Municipality.

It is noted that the research study aims to consider the socio-economic aspects of urban liveability, and the impact of new buildings on these socio-economic aspects. The City of Tshwane further notes that all ethical aspects of the research will be covered within the provisions of University of Pretoria Research Ethics Policy. You will be required to sign a confidentiality agreement form with the City of Tshwane prior to conducting research.

Relevant information required for the purpose of the research project will be made available upon request. The City of Tshwane is not liable to cover the costs of the research. Upon completion of the research study, it would be appreciated that the findings in the form of a report and or presentation be shared with the City of Tshwane.

Yours faithfully,

.....
Nosipho Hlatshwayo (Ms.)
GROUP HEAD: CITY STRATEGY AND ORGANISATIONAL PERFORMANCE

City Strategy and Organisational Performance • Stadstrategie en Organisatoriese Prestasie • Lefapha la Thulaganyo ya Tiro le Togamaano ya Toropokgolo • UmNyango wezokuSebenza namaQhinga aHleliweko kaMasipala • Kgoro ya Leanopeakanyo la Toropokgolo le Bodiragatši bja Mmasepala • Muhasho wa Vhupulani ha Ḓorobo khulwane na Mashumele • Ndzawulo ya Maqhinga ya Dorobakulu na Matirhele ya Masipala • Umnyango Wezeqhinga Ledolobha Nokusebenza Kwesikhungo