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PERCEPTIONS ON PUBLIC TRANSPORTATION INFRASTRUCTURE:

A proposed Transport Interchange for the Pietermaritzburg railway station precinct.

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Dissertation submitted to the School of Built Environment and Development Studies, University of KwaZulu-Natal, in partial-fulfilment of the requirements for the degree of Master in Architecture

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DECLARATION

I hereby declare that this dissertation is my own original work carried out under the supervision of Mr Majahamahle. N. Mthethwa. It is being submitted for the degree of Master in Architecture to the School of Built Environment and Development Studies at the University of KwaZulu- Natal, Durban, South Africa. The dissertation has not been submitted before for any examination or degree at any other University. All references, citations, and borrowed ideas have been duly acknowledged in the document.

Signed by Mohammed Iqbal Muslim

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ABSTRACT

In a world where travel is rapidly increasing, safer and efficient means of commuting become more pertinent. Citizens constantly endeavour to move about from place to place, be it from home to work or other destinations in a hassle free manner. In South Africa today, urbanisation necessitates the need for public transportation infrastructure development that appeals to a wider demographic, as the study reveals the disconnect between the middle to high income population, in public transportation use. Upon research, remnants of apartheid, along with concerns of safety were found to be critical in hampering the development of the public transport industry, thereby lending a negative perception of public transport infrastructure as a whole.

The most popular form of transportation in the city of Pietermaritzburg, are the mini-bus taxis, followed by buses, and private motor vehicles. The large numbers of freight trucks occupying the same roads as motorists daily, particularly between the city of Durban and Pietermaritzburg, also impacts negatively on commuter safety. Furthermore, the recent taxi violence and overhaul of private cars on the roads, both of which cause major traffic congestion, air pollution and numerous accidents, necessitates the need to reconsider the significance of the train supported by more formalised modes, as alternative means of transportation. In addition, the interchangeability of various modes of public transport offers the freedom and choice required to transpose perceptions on public transportation.

It is noteworthy that architecture in isolation, cannot address all the issues, but requires a holistic approach in remodelling the current transport system. However, a transport hub that transcends its conventional utilitarian nature by the introduction of a social entity can help to bridge the gap between demographics, as well as the fragmented parts of the city. Urban principles regarding the decline of cities and sustainable transport development approaches were explored in discovering the relationship of transport and the environment, economy and society. Ultimately, the transport hub, by becoming a destination in itself may be seen as a catalytic instrument for the revitalisation of the city, and the transport industry, thereby enhancing the public's perception towards public transportation and the urban environment.

"Transport interchanges have become the agora of the newly democratic state, the place of maximum commercial exchange and social interaction" (Deckler; 2006: 59)

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CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

1.1.1 Background

South Africa is experiencing a rapid rate of urbanization and like most developing countries, has faced difficulty in coping with this growth (Loots, 2002:1). This is evident in South Africa's predicament to expand infrastructure in most sectors of the built environment, and in particular that of public transportation. An exchange of western ideas, products and both international and intercultural resources is essential in enabling developing countries like South Africa not only to enjoy sustainable economic growth but also social equality through adequate urban transport systems.

The current public transport system in South Africa and in Pietermaritzburg in particular, has huge potential for growth, providing an opportunity to meet the needs of an ever growing society, seeking improved, safe and reliable modes of transport. There is particular interest in Pietermaritzburg's railway station which is a heritage landmark, and the prospect it has in being part of an aspiring modern era of social equality.

1.1.2 Motivation/ Justification for Study

Due to the expansion of human populations away from central areas into low-density, vehicle dominant communities, people living on the outskirts are forced to commute each day to experience all of the opportunities offered within the urban areas. A thriving metropolitan area necessitates the ability for people to move about from place to place.

As a consequence of the varied land use there is a call for transport infrastructure. The movement system of a metropolitan city is very important as it ensures that people have accessibility to jobs and recreational opportunities. Current public transport facilities in South Africa do little to promote the use of the industry and as a result there are a high number of private automobiles on the road. Intervention is required by government to change the public's perception of this sector and to facilitate the changes required.

There are promising signs of growing intent globally to challenge sprawling automobile oriented city growth. However, in contemporary South Africa, Apartheid spatial planning has defined the urban experience. Many black people still live far from places of economic opportunity and are forced to commute using dissatisfactory public transport services over long distances, for many hours at high personal and household costs (Bickford, 2016:7). This is the urban reality for the vast majority of urban dwellers. While it must be acknowledged that the level of basic services provided to poorer areas across the country has dramatically improved, post-apartheid officials have not been nearly as aggressive as earlier governments were in using planning and architecture to achieve their goals. (Findley and Ogbu, 2011)

It is understood that transit oriented development architecture together with mixed use neighbourhoods has a considerable role in improving urban mobility, decreasing road congestion, reducing the negative effects of vehicles on the environment and contributing to the betterment of the economy. Furthermore, it would provide strengthened alignment between public transport systems and urban development patterns, fostering more sustainable and liveable city fabrics. (Bickford, 2016)

It can be maintained that in order to change the public's perception of the public transport sector, a revitalization of the existing Pietermaritzburg station is in order as it serves as a platform for this industry in the formation of a new technologically driven society.

1.2 DEFINITION OF THE PROBLEM, AIMS AND OBJECTIVES

1.2.1 Definition of the problem

Public transportation has become vital in an ever changing environment and even more so, safe travel or commuting. Freeways are becoming more congested with time and accident prone with the many freight carriers travelling between major cities, in particular between Pietermaritzburg and Durban or even as far as Johannesburg and Cape Town.

Public transportation, in particular rail commuting in South Africa nowadays has lost significant numbers of patrons to other forms of public transport. Rail travel is seen to be predominantly for the poor as it is deemed to be a more cost effective mode of transportation both within and between cities. This is unfortunate as rail travel is a relatively economical means of travel and it provides a hassle free and sustainable journey, which is an extremely valuable asset considering the current

state of the world's environment and the drastic measures that are needed to conserve it. Rail travel has gained a negative perception rooted in apartheid and the associated class distinctions related to this travel mode which tend to deter potential commuters, coupled with issues concerning passenger safety, unreliability and uninviting station precincts due to their rundown facilities and post-apartheid collapse.

As a result, there is a stigma attached to public transport as a whole. However, this perception must be altered by the introduction of more efficient and technologically advanced ways of public transportation and infrastructure. Rail commuting in particular should be improved to address a major factor being that of commuter safety, which by its continued use will encourage growth in the economy and produce the least impact on the environmental footprint. Ultimately, there is a need for public transportation infrastructure to enhance the perception of people towards the environment and built form.

Perception is respective and very often inaccurate, because perception depends on what a person chooses to emphasise when evaluating a phenomenon or an experience (Gomzina, 2012: 51). The questions of identity, culture and meaning are some of the core factors which are essential in establishing how one makes a connection to the built environment. Therefore, for the purpose of this research it is essential to gain an understanding of the multi layered complexity of the perception process which is often disregarded by pioneers in the development field in realising an appropriate response to the challenges facing the urban environment in particular the public transport industry.

1.2.2 Aims

The aim of this research is to understand the relationship between perceptions and built form through an expressive, meaningful and well-informed architectural approach.

1.2.3 Objectives

In achieving the aims stated above, the objectives of the research are as follows:

- To understand the influence of perceptions on the built environment.
- To realize how and where these perceptions are formed.
- To investigate major factors that contribute to perception.

- To link perception, identity and built form to the urban environment.
- To reconcile the research regarding perception and redefine the identity of the public transportation industry in Pietermaritzburg, South Africa.

1.3 SETTING OUT THE SCOPE

1.3.1 Delimitation of Research Problem

This research looks at how perception influences built form in terms of sensory and cognitive processes. It also analyses the public transport systems that exist internationally and in South Africa to gain an understanding of how facilities should be designed more efficiently for its users. Additionally, analysis of the private sector of transport facilities will be excluded from the research as the focus is more on government funded or subsidized public transport facilities.

The research does not intend on creating a universally applicable solution to the problem in all contexts but rather focuses on the context of Pietermaritzburg, South Africa. An attempt will be made to derive architectural methodologies by which the future design of public transport facilities can adhere, to promote a better image for the industry and in turn promote use of public transport through a variety of socio economic groups. This document does not intend to study the distances travelled by commuters, nor does it intend to analyse the private transport sector.

1.3.2 Definition of terms

Perception - Is an individual's interpretation of the world around them. Perception, therefore has a large influence on the ways in which people interpret space and architecture, and as a result is intricately linked to architectural expressions of identity.

Built Form - In this dissertation the built form refers to architecture with specific regards to public transport architecture.

Heritage - Refers to something inherited from the past e.g. cultural heritage is the legacy of physical artefacts.

Train Station Typology - A railway station or terminal where trains load or unload passengers or goods

Identity - Is linked to culture, as people from common societies have a common way in which they perceive things and the world. "*Human identity presupposes the identity of place."* (Nesbitt, 1996: 425)

Public Transportation - Transportation available to the public which is normally run on set fares.

Sprawl - The expansion of an urban or industrial area into the adjoining countryside in a way perceived to be disorganized and unattractive

1.3.3 Stating the Assumptions

The perception of the built environment according to different individuals differs by varying degrees. Identity can be positively reflected through the creation of architecture which reflects integrity and legitimacy. Architecture can provide the platform towards addressing the issues surrounding the public transport industry and varied individual perceptions.

It is assumed that if people from a multitude of cultural backgrounds and classes make use of public transport, it will promote a united society. Additionally, greater opportunities will be available to previously disadvantaged individuals due to the accessibility public transport provides which may lead to a reduction in crime and poverty.

1.3.4 Hypothesis

The cognitive image that people have of public transport can be changed positively through meaningful architecture which consists of enhancing the influence of perceptions on built form.

1.3.5 Key Questions

PRIMARY QUESTION

- How can perceptions influence public transport infrastructure?

SECONDARY QUESTIONS

- What are the origins of perceptions?
- How do perceptions impact on identity?
- In what ways can identity influence built form?

TERTIARY QUESTION

- What are the perceptions and identity issues of public transport infrastructure in South Africa and specifically Pietermaritzburg?

1.4 CONCEPTS AND THEORIES

1.4.1 Introduction

The concepts and theories employed within this dissertation are presented comprehensively in the literature review section of the document. However, in order to establish some form of pre-understanding, a short breakdown has been included of key theories which outlines the approach that will be taken, and the framework for this study. The following theories have been carefully selected for their relevance in searching for a deeper discourse within the built environment with regards to perception.

1.4.2 Perception Theory

In philosophy and cognitive science, the theory of perception deals with attaining awareness or understanding sensory information. The word perception comes from the Latin words perceptio and means receiving, collecting, and apprehension with the mind or senses. (Qiong, 2017:18)
Jandt (as cited in Qiong, 2017: 18-19) claims that the perception process begins with selection, when an individual selects one stimulus from competing ones in the environment to which he/she is exposed. Afterwards, organisation takes place whereby categorisation of the stimuli through encoding is involved. The final step of the perception process is interpretation, which consists of attributing meaning to data.
The selection process, which is the first stage, happens because the stimulus is easier to notice due to it being drawn to one's attention over others in the environment. The selection stage moves into organisation whereby a person decides to arrange their ideas. In Jandt's opinion (2004), the need to

organise is linked intimately with identity. Juhani Pallasmaa in his book 'The Eyes of the Skin', explains the theory of perception by placing a constant emphasis on the importance of sensorial experience, tactility and identity. He emphasises how architecture has to integrate one with the space by addressing all the senses simultaneously and fusing the image of one's self with our experience of the world (Pallasmaa, 2005: 41). The theory of perception outlines the approach in understanding the relationship between people and built form.

1.4.3 Semiotics

Semiotics in architecture is the search for a deeper understanding of the built environment. It considers the linguistics that may occur in architectural experiences. Bonta (1979: 26) defines semiotics as a science which studies the life of signs and society, and can help clarify issues of meaning in architecture. One of the basic assumptions in semiotics is that the built form is dependent on cultural identity and memory (Baird & Jencks, 1970: 11). Most urban semiotic theory is based on social semiotics, which considers social connotations, including meanings related to ideology and power structures, in addition to denotative meanings of signs. As such, urban semiotics focuses on material objects of the built environment, such as streets, squares, parks, and buildings, but also unbuilt cultural products such as building codes, planning documents, unbuilt designs, and popular discourse about the city, such as architectural criticism. (Olla, 2012: 43)

Theorists who use semiotic methodologies define their discipline in contrast to human behavioural approaches, for instance Kevin Lynch in 'The Image of the City' (1960) is discredited for being restricted by his sole focus on the explicit level of communication - for example, the recognition of spatial elements, such as paths, as conceptual objects and overlooking the indirect meanings related to urban patterns; instead, urban semioticians claim that symbolic meanings in addition to functional meanings leads to urban structures becoming more recognizable (Gottdiener and Lagopoulos, 1986). It therefore can be argued that both functional and symbolic approaches are necessary in deriving accurate meanings in the urban environment.

Pallasmaa's and Bonta's approaches to explaining the phenomenon of perception amongst other theorists paves the way for the research as it gives one an understanding and framework on how to interpret architecture from two very different perspectives.

1.4.4 Concept of Hybridity

The concept of Hybridity ties in with the notions of identity and symbols whereby increased globalization has led to the merging of regional cultures with universal ideas. This includes the introduction of new technological ideas as well as new hybrid cultures. It is thus important to understand how symbolism and meaning should adapt where different perceptions and ideologies are combined.

1.4.4 Conclusion

The theories mentioned above will be applied within this research in the literature review chapters of the document. The extrapolation of these theories will provide the necessary theoretical apparatuses to inform the research regarding the design of a transport interchange.

1.5 RESEARCH METHODS AND MATERIALS

1.5.1 Introduction

The following investigative approach and research methods will be employed for the study:

Qualitative Method

This method of research presented a more constructive approach as it consists of engaging directly with users of public transport. It affords the prospect for comprehensive questioning and the capturing of verbal data from participants. This investigative approach also allows the opportunity to deliver the gathered data in configurations and themes which specifically deal with the participants, as a result not necessitating a large number of people or statistics to obtain data for the research.

1.5.2 Secondary Research

Secondary Sources: This will comprise of mainly relevant published research in the form of books by various authors, academic papers and journal articles. The information gathered in this manner will be utilized in the construction of the conceptual and theoretical framework making.

Literature Review: This will be used to gather views expressed by specialists that have written material on the problem at hand. The material will be sourced from published books. The material itself will deal with the issues that relate to human perception and architecture; this includes the influences of social media platforms and technology as well as spatial configuration and planning techniques and the current built form in a modern urban context. The literature review will also provide the theoretical framework of the research.

Precedent Studies: The appropriate information on the selected works will be gathered through an analysis of published journals, books, photos and published articles from the internet. The precedent studies will be selected from South African cities that are inaccessible to the author and mainly from cities in countries outside of South Africa. The selection criteria will be similar for the case studies and will also be analysed under the same conditions.

1.5.3 Primary Research

This is information that is obtained through engaging with local South African interviewees and case studies which they experience on a regular basis. This will provide an opportunity to test these findings against secondary data gained from published resources dealing with perception.

Primary Sources: Information gathered from primary sources represents the true aspects of the research. The following methods will be used to gather data for the analysis of the perception of urban public space in Pietermaritzburg as well as gaining an understanding of the dynamics of the transport sector:

Case Studies: These will be analysed to gain an understanding of the causes for the discohesive relationship between perception of people and the built environment. This will include local buildings as well as public transport infrastructure which people in South Africa make use of frequently.

Interviews: The interviewees will include people who have practical knowledge of the built environment as well as professional practitioners and academics who have experience in the field being studied. This will provide a first-hand explanation of any critical issues deduced by the author and expose the gap between the understandings of public perception from a top-down approach compared to bottom-up approach. There will be approximately 15 -20 interviews conducted for the research. Interviews will be directed at groups of people as well as on individuals to collect

sufficient information to analyse commonalities and to gain input from the public in order to understand their perceptions of public transportation in South Africa.

1.5.4 Research Materials

The materials that will be used in the research would include photographs, maps and drawings to analyse spatial qualities in terms of proportion, wayfinding, accessibility, aesthetic meaning, functional relationships, identity, and activities linking to the key theoretical and conceptual framework. The buildings will also be observed for physical qualities such as views and vistas, orientation, sound and smell, light and ventilation, and the way in which it responds to the environment as a whole. The actions of people and their behaviours and social interactions will also be observed.

The instrumentation used for analysing data will involve the following:

• Research data: Historical and philosophical background of precedents and case studies.
• Empirical Data: Observation studies, diagrams, schedules and sketches.
• Unstructured Interviews and Questionnaires: this will target commuters, business owners within the vicinity of the station, employees of the station, and the general public.

1.5.5 Conclusion

The research methods used to synthesize information is revealed through evaluation of information gathered from empirical and theoretical studies. These represent studies that are verifiable by observation or experience. The data is confirmed by published sources for analysis in establishing accurate findings. The outcomes gathered will be summarized to provide a clear understanding of specific findings and recommendations. The research methodology has been documented and the data collected has determined the theoretical and conceptual framework upon which the research is established.

1.6 CONCLUSION

1.6.1 Introduction

In the chapters to follow, it is hoped that the research findings will assist in understanding how buildings are perceived within a specific context, in order to gain a better understanding of architecture in the broader sense of society. An understanding of the processes of perception are the fundamental aspects of the dissertation outcomes. Thereafter, application of these theoretical frameworks towards the design of an appropriate built form is the ultimate goal of the author of this dissertation.

1.6.2 Summary

The study is limited to qualitative research methods and does not include any analysis or comparisons of statistics and figures. The research is based on published information and the authors own analysis and are limited to primary and secondary research as outlined above. The study is based on the information provided during the qualitative methodology and assumes this information as the most accurate. The research is limited by the resources made available and only to where permission has been granted to conduct such research.

The result of both primary and secondary research undertaken will be the development of a brief for the proposed modal interchange. Comprehensive analysis of research will contribute to the validity of a schedule of accommodation and a design approach that is validated.

1.6.3 Dissertation Structure

Chapter 1: Introduction

This will include a background, motivation for the study, definition of the problem, aims, objectives, delimitation of the research problem, definition of terms, stating the assumptions, hypothesis, key questions , concepts and theories, research methods and materials and conclusion.

Chapter 2-4: Literature Review

The literature review will begin by discussing the origins of perceptions from a historical perspective and will thereafter explore the processes involved in its development. Subsequently, the factors that impact interpretations will be considered which involves identifying aspects linking mankind to the urban environment. Through the above processes, the phenomenon of perceptions will then be linked to public transportation by analysing various architectural examples in a global context.

Chapter 5-6: Precedents and Case Studies

This will include introduction, justification of the study, location, historical and social context of the study, empirical data and conclusion. Through the analysis of these studies, a further interpretation on the influence of perceptions on built form, and in particular public transportation infrastructure will be established.

Chapter 7-8: Conclusion and Recommendations

This will include a summary of the dissertation highlighting the results found, recommendations and suggestions for further research.

1.6.4 Conclusion

This research does not intend on creating a universally applicable solution to the problem in all contexts but rather focuses on the context of Pietermaritzburg, South Africa. The research will attempt to derive architectural methodologies by which the future design of public transport facilities can adhere, to promote a better image for the industry and in turn promote use of public transport through a variety of socio economic groups.

CHAPTER TWO: PERCEPTION ORIGINS

2.1 INTRODUCTION

The origins of the theory of perception is essential in gathering a basis of understanding how perceptions can influence built form. The topic of perception can often be misunderstood by people; therefore, it is important to first understand the fundamental aspects of perceptions before exploring it further.

In the majority of scientific disciplines, the purpose is to explain objective facts and events. This means that these events are independent to the observer, they are observable to all, and are not illusions. However, in the subject of perception, the focus is on how things appear rather than the objective reality. Therefore, in the study of perception, the task is to account for these appearances, and discover their determining factors, in realizing how the world is perceived. (Rock, 1975: 3)

From a historical perspective, many philosophers have contributed to the development of the field of perception. The underlying theme agreed upon by many scholars in the seventeenth century long before psychology became a scientific discipline, was that knowledge of the world is acquired only through the "senses". George Berkeley (1910), a strong advocator of this idea, believed that all knowledge is therefore attained through prior experience provided by sensory abilities and that sensations, particularly vision aided by touch, may not provide knowledge of the world but can provide the basis for arriving at the correct interpretations.

In the following century, Hermann Von Helmholtz (1867) argued that perception involves unconscious processes which interpret the current stimulus on the basis of past experiences and that this interpretation is the perception. As was the case with the empiricist school of thought, Helmholtz (1867) believed the senses responded to the proximal stimulus, i.e., the physical stimulus acting upon the sensory receptors, apart from the distal stimulus, i.e., the stimulus emitted from some object. In terms of vision, light is reflected off objects in the world beyond the senses and that is what the photoreceptors react to. The information provided by the proximal stimulus and reported on by the receptors, was disregarded. Nevertheless, it was the object world that perception was supposedly to be about. Given the weak nature of the retinal image, the perceptual process must capture the information from the retina and interpret it somehow, in order to produce a perception of the world beyond the senses. (Helmholtz ,1867)

Hering (as cited in Rock, 1975: 14), who was a precursor of Gestalt psychology, sought to explain perceptual phenomena in terms of physiological mechanisms and functioning of the nervous system. The Gestalt movement criticized the relationship between sensation and perception in that our sensations are not interpreted in this or that way but through the sensory experiences being a direct function of the proximal stimulus. The various stimuli do not work in isolation from one another which eventually sums up to a certain percept, but rather they interact to form a relationship which leads to a collective sensory experience. (Rock, 1975: 18)

The scholars' viewpoints mentioned above regarding perception prove its complexity and its multiple classifications. It is therefore crucial to explore all the constituents of the sensory experience including the influencing factors of interpretations of the environment in attempting to understand perception and unconscious cognitive processes.

2.2 THE MULTI SENSORIAL EXPERIENCE

Many philosophers have realised the dominance of visual perception or sense of sight in the sensory experience. As stated by Pallasmaa (2005), the perception of sight as our key sense is substantiated by perceptual, physiological, and psychological facts. However, the complications arise from the separation of the eye outside its natural interface with other stimuli as this leads to a subdued experience of the world bound by present day fast paced, simultaneous events.

Philosopher Gaston Bachelard (as cited in Palassmaa, 2005:41) speaks of the polyphony of the senses. In life, the stimulation of the senses does not occur in isolation and embodied experiences are crucial to our wellbeing. Therefore, experiences of the world involve several realms of the senses which act together to form a multi-sensory experience. According to Pallasmaa, the senses process information for the judgement of the intellect which also ignites the imagination and articulation of sensory thought. Hence, Pallasmaa (2005:72) views the multi-sensory experience as a means of reconciliation between one's self and the world. Our bodies thus contribute to our spatial and temporal perceptions. Paul Rodaway, in his book 'Sensuous Geographies; body, sense and place' metaphorically makes the example of the body being a ship, and the senses its anchor in our physical experience. Hence, the senses facilitate the connection between us and the environment, giving us access to a world beyond ourselves. He goes to the extent of mentioning that without our physical being one would have no geography, implying orientation, movement and consistency. (Rodaway, 1994:31)

The five senses sight, touch, smell, sound and taste are unconsciously and subjectively used in the perception of the built environment. James J Gibson (as cited in Palassmaa, 2005:41) explains the senses as forcefully searching apparatuses rather than passive receivers. He classifies the senses into five sensory systems: the visual system, auditory system, the taste-smell system, the basic-orienting system and the haptic system. These sensory systems and the interpretations of them will subsequently be discussed below.

Visual System

Sight is often regarded as the most dominant sense. How one perceives the environment is usually fixed around what is seen. The eye integrates all the other stimuli, in the sense that what the eye sees, the other senses clarify. When you enter a garden, you see and recognise its nature. But then you hear the trees bustling in the wind, smell the flowers, touch the petals, and you become fully assured of where you are (Osei, 2014: 12). Additionally, an important feature of sight is the differentiation between focused and peripheral vision. Pallasmaa (2005:10) highlights the importance of peripheral vision, stating that the built environment continues to be interested on focused vision, yet the quality of it depends essentially on peripheral vision which envelops a person in space. Pallasmaa (2005:10) explains that peripheral vision converts retinal gestalt into bodily and spatial experiences, i.e. peripheral vision incorporates people with space, while focused vision drives people out of space, making them mere observers rather than participants.

Auditory System

The term auditory includes both listening and hearing when describing the sensory experiences of sound and the acoustic properties of the environment in the use of the perceptual system (Rodaway 1994: 84). Similar to the significance of the eyes in visual perception, the ear is an intricate organ and is the focus of auditory perceptions as it collects vibrations from the air and converts them into nerve impulses which are inferred by the brain. According to Rodaway (1994) auditory perception occurs both implicitly- through the friction of movement against the external environment, and explicitly- through the vocal cords. Thus, the auditory system involves the whole body akin to the other senses. Predominantly, the physical being has its own biorhythms which permit us to assess sound patterns through pace, rhythm and duration. (Rodaway, 1994: 91) As a consequence of such interpretation, a person who is hearing impaired would be capable of hearing with his skin when moving through spaces.

Rodaway (1994) further states apart from merely perceiving the auditory world around us, we have a presence in it as we are participants within this world.

> "Therefore the wonder of the auditory system, as with all perceptual systems, is the way it manages to decipher an order, a sense of the world, and of people, places and spatial relationships from this complex mass of sensuous information." (Rodaway 1994, 92)

The auditory experience occurs from all directions unlike vision which is focused. However, the use of sound or the lack of it can be used to enhance certain atmospheres. In such environments, the silence collaborates with our perception, causing moments where we are able to imagine (Osei, 2014: 12). This consequently allows visitors to acquire varied meanings in relation to their experience of the environment. Pallasmaa (2005) mentions that sound plays an essential part of spatial experience as it frequently provides the temporal continuum in which visual impressions are a part of.

Taste-Smell System

The taste-smell system has the ability to capture and preserve the memory of an environment, as a result of the distinct scents of elements within that environment, and the sensitivity of the physiological system. This particular stimulus can often bring back strong past experiences and emotions, and new-found scents may be retained and recognized at a later time. Since we are unable to name the various scents we experience, spatial qualities can be often be associated with particular smells. For example, the expression "it has that hospital smell" is acquainted to most people because of the smell linked to hospitals. The senses of taste and smell are usually unified as they work collectively and can be distinguished as alternative ways to experience similar sensations. The nose can detect hundreds of substances in minuscule quantities while the tongue can only identify 7-8 different taste. However, when a particular substance is tasted, the nose works together with the mouth, making the experience more satisfactory or dissatisfactory. (Osei, 2014: 11)

Pallasmaa (2005: 59) claims that the most ancient origin of an architectural environment is found in the cavity of the mouth, as the consideration of the various aspects and multi-sensory combinations of the taste-smell system can enhance the experience. He believes that this particular stimulus can guide the body into a connection with the world through emphasis on the experience of taste in the built environment.

Haptic System

The haptic system involves the process of recognising objects through their physical properties, and consists of any stimuli which utilises touch. As stated by Pallasmaa (2005), vision reveals what touch is already aware of. Thus, the sense of touch can provide three-dimensional information to objects and is therefore often referred to as unconscious vision. Pallasmaa (2005), speaks of hapticity in association with the other senses, stating that all of our senses are an extension of touch, which is one of the most primitive experiences in architecture that naturally occurs. By touching surfaces, we experience more than by only gazing at materials. Haptic experiences occur by physical exploration and movement through a space. According to Pallasmaa (2000), in his essay 'Hapticity and Time', he argues that the sense of touch is a mediator between ourselves and the world. In addition, he states,

> "Touch is the sensory mode which integrates our experience of the world and of ourselves". (Pallasmaa 2005: 11)

The word haptic comes from the Greek term meaning to lay hold off. Along with the sense of touch, the haptic system involves all aspects of physical contact including pain, pressure temperature, kinaesthetic etc. Visual design only allows us to be mere spectator's, whereas haptic environments unifies and engages us with a space. To distinguish the contrast between hapticity and touch, hapticity can be seen as three dimensional while touch can be seen as two. Touch can be seen as one of the most significant systems as it connects you physically to the environment (Fig 2.1). Alternatively, hapticity offers more, as it combines time, emotions and memories. George Berkeley (as cited in Palassmaa, 2005), stated that a relationship between vision and touch exists whereby the support of the haptic memory, makes the cognizance of materiality, spatial depth and distance possible.

Figure 2.1: The Lonely Metropolitan.
Source: Bayer, 1932

Orienting System

Our orientation system is dependent on the correlation between our vertical posture and the horizontal ground plane (Monice, 2003: 42). According to Gibson (1966), the subsequent orientation causes us to aim for a symmetrical balance, and that the senses are always directed according to that vestibular system. He emphasises the role which the basic orienting system has in detecting environmental information used for the active control of behaviour. It involves bodily equilibrium and the means by which we pick up information about our orientation in relation to gravity, force and acceleration. The basic orienting system is necessary for feedback on our spatial position, as it lays the foundation for the other stimuli. As mentioned above, it is related to gravity and gives us information from our movement in space. In further explanations of the perceptual system, Gibson (1966) states:

> "All the perceptual systems…can serve to govern directed locomotion. They are all orienting systems insofar as they guide the individual to a goal."

Therefore, the world can be understood either through a singular complex perceptual system or by the integration of the perceptual systems working together. (Gibson,1966: 55)

2.3 THE SIGNIFICANCE OF COGNITIVE PROCESSES IN PERCEPTION

People perceive the world according to what information is received from sensations.
The cognitive process can be described as the mental process of receiving and ordering these sensations. It encompasses but is not limited to identity, thinking, feeling, remembering and understanding meaningful learning. Hence, it is understood that the field of perception lies between sensory processes on the one hand and cognitive processes on the other.

As stated by Rapoport (1977), cognition is the ability of making a chaotic environment orderly, predictable and manageable. The cognitive process or mental representation towards the environment differs from person to person depending on their cultural background (Lang and Burnette: 1974). In addition, the physical environment in which one grows also has an influence on cognition resulting from one's interaction over time with his or her physical surroundings. From Rapoport's (1977) explanation of cognitive processing, it is evident that cognition is the means of encapsulating data by imposing a structure on the environment. This structure is a fundamental part of the perceptual process in which information is arranged and classified. These mental

organisations as termed by psychologists are known as schemata. Rapoport (1977) refers to schemata as the way dwellers organize their past and present experiences and use memories to anticipate future behaviour. There are several elements developed to support the structure of thinking during the perceptual process, these elements can be identified as mental imagery or cognitive mapping which will be discussed in further detail below:

The Mediating Role of Mental Imagery

The mental image is a necessary part of planning behaviour in which we anticipate our actions. Lang and Burnette (1974: 170), uses the example of a driver who cannot act to control the movement of his vehicle without some spatially organised "idea" which links him to the machine and the machine to the world. In a similar way, we rely on abstract visions of the environment which relate to the activities we observe, to orientate ourselves in the world.

The mental image we develop assists in the mediation of our perceptions by allowing us to identify and store aspects of our experiences, and they also become a way of assessing the impact of an environment on our lives (Lang and Burnette,1974: 170). Kevin Lynch in 'The Image of the City' (1960) mentions that the environment suggests relations and distinctions which the observer adapts and purposely selects, organises and associates meaning with what he sees. The mental image developed condenses but emphasizes what is seen, while being interactively tested against filtered perceptual input (Lynch, 1960: 6). The process by which the fundamental process of acquiring, coding and decoding spatial information for the comprehension of the physical environment can be termed as cognitive mapping. As stated by Rodaway (1994: 32), the support of memory and anticipation, and the movement of the body, allows for the development of a broader 'map' of the environment through which it explores. Moreover, technology extends the boundaries of the body and gives us a sense of experiencing a world in addition to the body.

The psychological theory explained by Kevin Lynch (1960: 41) introduced five types of elements by which people form their mental image of the environment: nodes, paths, edges, districts and landmarks. Nodes are points or intensive foci which people may enter and leave; paths are channels of movement; edges or boundaries which contain or break the continuity of form; districts are areas or domains which have an identity, form or character that is recognizable; and landmarks are points of reference which are independent of the observer and are drawn out for the purpose of identification, orientation or structuring. It is the fusion of the qualities of these various elements which develops the mental image of the observer and gives meaning within the urban environment.

Thus, Lynch viewed urban imagery primarily as a visual phenomenon but according to Lang and Burnette (1974: 161), a cognitive map gives prominence not only to things which are visually significant, but to things important for political, historical, economic and other reasons.

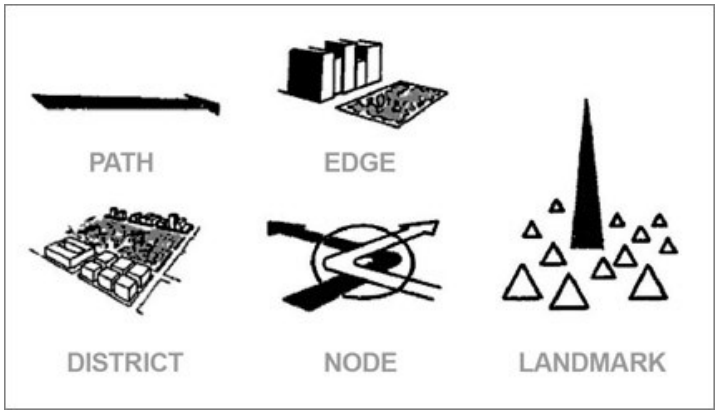

Figure 2.2: Lynch's five components of urban structure.
Source: http://urbanwaterfront.blogspot.co.za/2011/02/image-of-city.html.
[Accessed 12 April 2018].

Furthermore, Lynch (1960) describes the ease and clarity with which people form memories and images. Lynch states that inhabitants of a city have personal experiences with different parts of the city and that the image an individual has, will be built on memories and meanings gathered over time (Lynch 1960: 1) This thought process is reflected by Lynch (1960) as ‘imageability’. This emphasizes the importance of developing an environment that has a positive impact on those experiencing it by creating spaces where careful thought has been taken to create a positive sense of place.

2.4 CONCLUSION

From the above literature it can be established that the origins of perceptions form the base to which the phenomenon stands. However, according to Helmholtz (1869), these are insufficient to represent the external world accurately as what one perceives is at times not consistent with sensory stimulation. The percept therefore involves, mediation from within the observer, the sensory experience, and some reasonable consequent processing of the sensory input before it is delivered to the mind as the completed percept. The above mentioned mediating processes which contributes to cognition will be further explored in the following chapter.

CHAPTER THREE: PERCEPTIONS OF IDENTITY

3.1 INTRODUCTION

Identity in its nature is a multi-layered and complex subject, however it is very closely intertwined with perception. In simple terms identity is the product of factors through which individuals see others and how they see themselves. Jenkins (1996) defines identity by the following:

> "Identity refers to the ways in which individuals and collectives are distinguished in their social relations with other individuals and collectives" (Jenkins, 1996: 4)

Nevertheless, when studying identity from an experiential perspective, perception influences identity by forming a co-constitutive relationship. This means each aspect makes the other possible as identity can be described as an accumulation of personal experiences as influenced by the social, political, and cultural factors that frame and mark those experiences, while perception or how one sees the world, is always mediated through these personal experiences. (Sloan, 2017)

This component of the dissertation will create a theoretical framework in the development of the field of perception which will be outlined through the concept of identity, relating to various factors impacting the nature of the human subject, together with developments in architecture. This will be done by examining the significance of place, linguistics, culture, the relationship between man and the environment, by considering the impact of identity and the numerous meanings of perception. Ultimately, the chapter aims towards developing a thorough understanding of the field of perception before creating a connection of perception to public transportation infrastructure.

3.2 DEFINING THE CONCEPT OF IDENTITY

The concept of identity has been perceived through several ways. Freud (1911), the founder of psychoanalysis, was one of the foremost scholars to reference identity in his works. From then on, the concept of identity has been examined by numerous authors, with some of the contemporary authors being Leary and Tangney (2003).

According to Lustig and Koester (1993), the concept of identity can be seen as static, with a core that is not likely to be changed during the life of an individual. On the contrary, Mead (1934) mentions identity as being fluid, or of an ever changing and dynamic nature. The perspective of

characterising identity as static, is a basic and simplistic way of looking at the concept as it is easier to determine the product of the phenomenon of identity, rather than to characterise how identity evolves, and recognise its complexity. For instance, in identity, the questions of varied perceptions are probed; how do different individuals perceive objects in the world and how do individuals build impressions of themselves, for others to perceive them. The aforementioned threefold manner of observing identity seeks to explain that if everything is derived from perceptions, there is no singular or rudimentary definition of somebody's identity. Huntington (1997) states,

> "It is defined both by common objective elements, such as language, history, religion, customs, institutions, and by the subjective self-identification of people."
> (Huntington 1997:43)

Hence, the author of this dissertation deliberates that the process of defining identity necessitates the adoption of a flexible perspective, in line with theories that suggest the concept of identity as being fluid, adaptable and constantly evolving. Bhikhu Parekh in his book 'A new politics of identity' (2008) speaks of three dimensional identity comprising of three interlinking components. The first being an individual's identity based on the inner self or their unique innate qualities developed from birth. The second component is derived from the paradigm of social construction whereby an individual's identity is emphasised through a person's association with certain groups such as ethnic, religious, cultural, etc. which define themselves and allows parameters for others to define them in return. According to this component, the social reality of individuals emerges through actions, with perceptions of the world being formed through collective verbal and nonverbal communication. Furthermore, identity from this viewpoint is something that is passed down from generations, and from interactions outside the immediate social world. This classification reconciles the inside and outside, and public and personal (Hall, 1992: 276). Parekh (2008) refers to the third component of identity as a combination of the abovementioned components, that is an individual's personal and social identity respectively. In understanding Parekh's view of the third component of identity, the author emphasises a person belonging to a group of the same species. This represents identity amongst humans on Earth in broad terms which implies the presence of a social aspect. Therefore, the third component can ultimately be understood as an individual conducting themselves as a human being in society.

Formation of identity

Stuart Hall (1992) seeks to describe the complexity of the concept of identity in order to understand the varying perspectives of human being's nature. As stated by Hall (1992), identity is altered constantly according to our representation in cultural systems around us, and is historically defined as opposed to biologically. The result of this standpoint is that identity can be carefully chosen, imposed, or excluded according to one's perception of themselves, or their categorisation by others. This kind of identity goes against spatio-temporal change so therefore remains adaptable in space and time. Moreover, a broad array of cultural resources can be used to build such identities. (Hall, 1992: 277)

There are also various factors or influences responsible for the construction of identity. These factors as elucidated by Erikson (1968), are a person's genetic or innate characteristics, their mental needs, values, interests, and objections, along with the surrounding cultural environment. All these factors contribute collectively in influencing one's self identity. Erikson (1968, as cited in Kroger, 2000:9), explicates the significance of the cultural environment when integrated together with biological and psychological factors, as it provides a person with a sense of "bodily self" (Erikson 1968, as cited in Kroger, 2000:9). Furthermore, the sense of a 'bodily self' gives an individual an awareness of who one is, along with a perception of one's identity as a solid entity.

Singular vs. Plural Identity

As mentioned earlier, the position of viewing identity in its complexity is highlighted. However, in determining the factors that influence the complexity of identity, questions arise as to whether identity is singular or plural. Parekh (2008) states that,

> "this helps us to grasp and cope with the inescapable complexity of human life and to avoid taking a simplistic view of it." (Parekh, 2008: 24)

The contemporary approaches to the concept identity favour the latter approach. (Parekh, 2008; Sen 2006). However, Parekh (2008) mentions identity may be singular but also changeable to avoid being static and primitive as this allows for some continuity of the concept. In order to avoid identity to be seen as monolithic, Parekh (2008) further explains the autonomous nature of the concept of identity in which plurality is highlighted. He maintains that since life is inherently plural

whereby different areas in life are independent, the context to an area of life dictates which identity, as socially defined, is relevant, which determines the appropriate action. In addition, Sen (2006) supports the standpoint of identity being plural wherein people cannot be identified primarily on the homogenous civilization they live in, their religion or one culture, but rather it is various other secondary factors that make a person who they are which needs to be considered.

3.3 IDENTITY AND CULTURE

Before the discussion on the interrelationship between identity and culture, it would be relevant to ascertain what culture is. Culture is a term that is multifaceted and often debated amongst scholars noting roughly 160 definitions of the word (Kroeber and Kluckhorn, 1952). Professor Greg Noble discusses culture in relation to identity by affirming that culture begins as a noun of process-cultivation and its broken down into two areas – the anthropological meaning of culture as a whole way of life; and the artistic side which deals with cultivation of the mind. From an anthropology perspective, culture is implied as a collective experience dealing with a classification of a group of people or a community, whereas the focus in the cultivation of the mind is primarily individual or even psychological and sees culture as a process of development. Furthermore, the anthropological meaning focuses on the folkish understanding of culture exploring people as a whole while the latter idea focuses on the experiences of the elite cultural and artistic practices. Finally, the whole way of life idea suggests culture as a stable social entity where cultures are seen as timeless or ongoing yet simultaneously much of what we discuss of culture today is dynamic, changing and evolving which is associated with the artistic approach.

Hall (1997) reveals that culture can be understood as representing the best that has been thought and said in a society, referring to an assortment of the best ideas, depicted in various classic works of literature, painting, dance, etc. He further explains culture through the lens of social science, meaning the unique way of life of a nation, community or social group (Hall, 1997:2). This can be linked to the anthropological meaning of culture as mentioned above. Moreover, Hall (1997) then argues that culture is not a set of things but a set of practices mostly concerned with the exchange and production of meanings between social groups that have consistent interpretations of objects in the world. For instance, if two people are akin to the same culture, they interpret the world in relatively similar ways, presenting their ideas and emotions, and expressing themselves in a manner that is easily understood by each other depending on the participants.

According to Hall (as cited in Alshammari, 2018: 98), social practices can alter the formation of interpretations depending on the actions of participants that select the language to be communicated. Thus, identity is formed when they talk and converse with others. Alternatively, identity in respect to culture is not clearly represented because of the varied positions of its participants (Alshammari, 2018: 99). On the basis of questions regarding the significance of identity in comparison to culture Friedman (1996), states,

> "Culture, then, has not changed due to the increasing complexity of the world. What has changed, is the way in which identity and meaning are attributed within and among populations that have in fact been interacting for a very long period."
> (Friedman ,1996: 75)

Friedman (1996) suggests the factors which change are the interpretations and attributions of meaning that must be understood in varying social contexts. The author explains that culture having shared components from other cultures is no new discovery and therefore does not make the concept autonomous. Rather Friedman (1996) makes the point that the fact that these imported elements absorbed by cultures are not part of a homogenous whole leads to questions of the stable nature of identity which causes the lack of integrative processes. (Friedman ,1996: 75).

Evaluation of the views by various scholars discloses a connection between identity and culture, and also the parallel characteristics of the concepts. As was mentioned earlier in the chapter, one of the defining features of identity is its static capacity, meaning having core principals, and the ability to maintain these principals throughout the life of an individual. Additionally, also highlighted previously, is the fluidity of identity suggesting identity can be seen as constantly evolving having no specific stable element. Similarly, the opposing dual perspectives of the concept of identity can also be linked to the concept of culture, namely culture can be seen as being static or it can be seen as constantly changing. Furthermore, building on the correlation between the two concepts of identity and culture, the flexible and constantly adapting idea of culture forms another position of the nature of culture. For example, the dynamic and evolving nature of culture is in line with the plurality of a person's identity as expressed by Parekhs (2008) interpretation of identity as an autonomous entity. Novitz and Willmott (1990:280) regard the notion of culture as collective, by stating that it is utilised in a manner which categorises groups of people by accumulating their distinguishing and interdependent patterns of behaviour and communication, along with beliefs, values and experiences which guide them.

From the above viewpoints it can be concluded that culture, like identity, has also the capability of collectiveness. As a whole, identity and culture form an assemblage of individuals, and also guides their identification in terms of collectiveness. Therefore, the relationship between identity and culture is a shared process that works in both directions.

3.4 PLACE AND IDENTITY

The concept of place and identity theory, similar to Lynch's theory highlights the importance of identifying with a particular place and being able to traverse around it. It has a direct link to the different aspects that construct the legibility of a city and how one feels in it. Fundamentally, it links to a cognitive, deeper psychological level as to how an individual perceives the environment. This emphasizes the role of architecture in having a positive impact on those experiencing it, by making an environment where informed thought has been taken, to create a positive genius loci or 'sense of place'.

In Phenomenology of Perception (1945), Merleau-Ponty emphasizes the bodily experience developing a rich variety of phenomenology.

> “Phenomenology establishes a broad conceptual framework which focuses and maintains attention on perceptual experience itself” (Glotzbach & Heft, 1982: 119).

Though phenomenology can be viewed as a paradox paradigm, the core of it is the "exploration and description of phenomena", which simply means how humans react to a place through direct experience and how that place influences feelings and behaviours (Seamon, 2000:3). Demonstrated in architecture, phenomenology can be described as the manipulation of space, light, shadow, and material to create a memorable encounter through an impact on the human senses. It thus promotes the integration of sensory perception as a function of built form. According to Norberg-Schulz (1987), in order to build, one has to interpret the spatial structure and character of a particular place. Every place is said to have character, which integrates natural, personal and cultural dimensions of the environment into one experiential whole (Relph, 1976).

The Constitutional Court in Johannesburg, South Africa by OMM Design workshop is an example of a civic building referred to as a cultural and architectural achievement. The site itself is positioned on the Braamfontein ridge in close proximity to the city thereby having the potential to revitalize the adjacent neighbourhoods. The setting of the complex on a hill gives it prominence in

the local context and South Africa as a whole. In terms of the background of the site, it was perceived as a symbol of the Apartheid past, as a result of the former Old Fort building which was later converted to a prison that housed many political prisoners during the Apartheid regime including Mahatma Gandhi and Nelson Mandela. This highlights the importance of the context in the search for meaningful expression of built form. Hence, the design approach was for the precinct to become a public space in the urban environment representing a symbol of democracy for South Africa. This included a variety of civic buildings such as the Constitutional Court itself, the Human Rights Commission, museums and a public square at the heart of the complex. Therefore, the site came to be known as Constitutional Hill. The aim of OMM Design workshop was to incorporate the new and existing urban built forms with the spatial, experiential, textural and cultural system of Johannesburg (Schaug, 1998: 46). The open public space known as Constitutional Square rejoices in the freedom of people to mix and integrate which was so strongly constrained during apartheid, by allowing a generously accessible public space beside the pedestrian zone thus promoting social interaction. In the same way, the accessible nature and inviting features of the design is then associated with the justice system itself, consequently altering the negative perception possessed by the people (Makin, 2006 cited in Law-Viljoen, 2006).

The outcome of the design is referred to as a thorough response to the context with regards to the general footprint of the development while remaining an active and dynamic entity.

Figure 3.1: Constitutional Hill site plan.
Source: Lipman, 2004

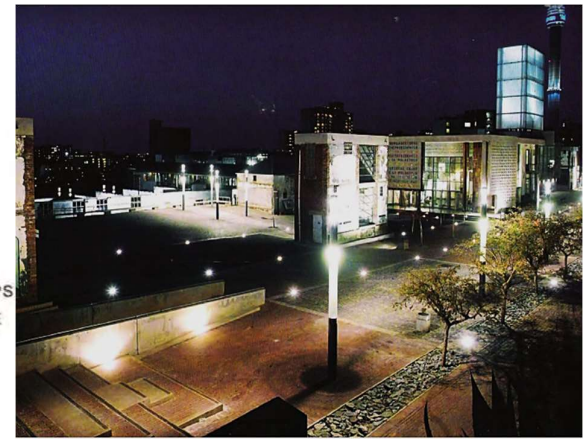

Figure 3.2: Constitutional public square at the centre of the complex site.
Source: Law-Viljoen, 2006

The design displays volume and light amongst a composition of solid and void elements, which are essentially linked with African identity (Davids, 2007). An informal communal gathering space known as imbizo was the underlying concept in the design of the foyer. This represents dispute resolution in traditional rural African community's which takes place under a protective tree. Rectangular slits in the concrete roof allows natural light to filter through a wire canopy of leaves which creates an attractive, textured quality of light on the floor reminiscent of a forest clearing. In addition, the primary materials comprising of concrete, timber, steel, glass and black slate impart an African feel to the court. Furthermore, the slanted columns, metaphorically depicting the branches of a tree holding up the court, are decorated in detailed mosaic. The open and engaging qualities of the building shows that the court replicates the form as well as the tranquil and perceptive properties of a tree.

The foyer of the building is inviting, well lit, easily accessible, and acts as the preface to the court. The transparency offered by the glazing of the foyer signifies that the court belongs to the people by the constant link with the outside public. Moreover, the extensive use of the concrete in the building denotes durability and resoluteness. On the contrary, lamp shades, mosaics, and brickwork have been used to temper the cold sensation associated with use of concrete, and to infuse warmth, character and culture to the interior. The mixture of elements utilised in the Constitutional Court assists in the enhancement of the cognitive image for the institute. More importantly, although the user may be unacquainted with the cultural expression of the building, the experiential quality of the space will provide meaning that the space is significant and exalted (Law-Viljoen 2006).

Figure 3.3: Shows the transparency of the foyer area and the perforated concrete and slanted columns representing the notion of the tree.
Source:http://www.angelabucklandphotography.com/project/constitutional-court/ [Accessed 11 May 2018].

Figure 3.4: Shows the meaningful expression of the space.
Source: https://www.pps.org/article/courts-in-a-new-paradigm-of-place [Accessed 11 May 2018].

The building pays respect to its context and shows the influence of place in the creation of identity, as well as society, however, this should involve the incorporation of culture together with nature (Patel, 2007). Hence, place identity is also the formal composition and materiality of the place, which requires us to ask how the place is framed by the sky and earth and how the landscape's details allow for the character to manifest. Everything contributes towards the character of a place: the trees, the flora and fauna, the water, the earth and even the dwellings within the landscape. Landscape is often personified when their character is explained, much like how a barren landscape can be considered as threatening or a thriving landscape as smiling (Kraus, 2014).

As humans, dwelling implies something more than shelter in that there is an interdependent relationship between the house and the surroundings.

> " Man dwells when he can orientate himself within and identify himself with an environment, or, in short, when he experiences the environment as meaningful" (Norberg-Schulz, 1980:5)

Therefore, through place identification, we give our life a presence and identity. In this sense, dwelling requires something from both the places and also from human beings. To understand place identity, Norberg-Schulz singles out concrete features of place, drawing on concepts and relating it to the earth, sky, and optical array. Consequently, place identity first involves what we walk on, what is above, and what we are aware of around us. Therefore, if the place does not stir the idea of being at peace in a protected landscape then it is said to have a negative phenomenological impact.

Ultimately place-making accounts for the relationship between nature and man and results in a distinctive space created within this place. It is the interaction of landscape and settlement and analysed by space (tangible) and character (intangible). If the settlement organically intermingles with the landscape it can be considered to be serving as genius loci: where the character of the landscape is condensed and explained in that single settlement. This can be seen when Norberg-Schulz said: "the detail explains the environment and makes the character manifest" (Nesbitt, 1996). Accordingly, if a structure is reminiscent of its environment and emulates the character of the place, one can argue that it enhances the phenomenology more so than having a structure that goes against the grain of the earth. Nesbitt (1996) states that a place is essentially a total phenomenon, which cannot be reduced to any of its characteristics, such as spatial features, without losing its authenticity. This explains that by constructing a structure that does not relate to its environment, the overall atmosphere and character of the place is reduced and the beauty of it is lost. Moreover, according to Heidegger (1971), "the relationship with nature is crucial for the experience of the

place." This once again emphasizes that the built form needs to be a part of the environment in order to appreciate the phenomenological value.

Norwegian architects, Jenson and Skodvin, are renowned for designing structures that capture the spirit of the place. The Juvet Landscape Hotel is an example of how built form does not detract from the place character but rather enhances the spirit of the forest through sensory experience. The landscape character is created by an intricate fusion of micro structures such as uneven surfaces, tree roots growing out of the soil, moss, flowing water that changes the landscape and forest life that swells and shrinks depending on the seasons. It creates the idea of tranquillity, peace and silence. Jensen and Skodvin thus employed an approach reminiscent of Norberg-Schulz (1980) by interpreting the environment. They knew that by creating a large hotel form within the forest, they would be imposing on the landscape Therefore they created multiple but separate hotel rooms that are scattered throughout the forest (Fig.3.5). By doing this they were able to replicate the landscape's atmosphere of seclusion and solidarity as each room has a different view of the forest. Moreover, they were able to reduce the human impact on the earth as the structures are raised off the ground (Fig.3.6).

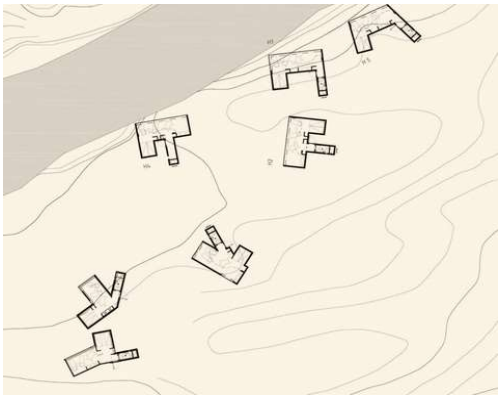

Figure 3.5: Topographical spatial arrangement.
Source: https://www.archdaily.com/8600/juvet-landscape-hotel-jsa [Accessed 10 May 2018].

Figure 3.6: Spirit of place.
Source: https://www.archdaily.com/8600/juvet-landscape-hotel-jsa [Accessed 10 May 2018].

The materials that are used have a direct relation to its surrounding. The use of timber slats on the facade aids in giving the building a direct link to the landscape, as they are reminiscent of the trees that are abundant within the forest. The timber helps to ground the raised structure giving it a tangible appeal. Jensen and Skodvin use large glazed openings within the design to create the idea

that the inside space is ultimately a part of the outside. From the exterior, the glazing reflects the surrounding trees, much like a reflection in a lake, making the building disappear completely (Fig.3.6). The overall image of this built environment is that of a structure that sits subtly in its environment. It does not steal attention away from the natural environment but is rather organically related to the environment. It tells a condensed story of the environment, rather than a new story which enhances the character and phenomena of the place but is still able to create a place of dwelling. The lines are blurred between whether the forest belongs to the hotel or whether the hotel belongs to the forest. This is symbolic of Norberg-Schulz (1980) theory of genius loci in preserving the character of the house but at the same time lending a new manifestation of it.

It can therefore be concluded that by remaining open and sensitive to the surrounding environment, architectural design strategies can be employed to enhance the human experience in how people conduct their lives. This is the essence of what architecture seeks to achieve. Instead of buildings merely being visually appealing, a greater emphasis should be placed on how such buildings influence the senses through its contribution to place-making which results in an emotional connection that makes a place so memorable.

3.5 THE CORRELATION BETWEEN MANKIND AND THE BUILT ENVIRONMENT

In the modern world, people spend most of their time utilising some aspect of the man-made environment in different ways be it where they live, work, play, and the in between spaces or social surroundings such as coffee shops, mosques, transport hubs, public libraries, parks or urban plazas. Hence, people continually find man-made environments surrounding them demonstrating the significance the built environment has in the lives of people. A deeper understanding of this relationship is therefore key in ensuring that building design can better respond to human beings.

The built environment similar to the natural environment also provides the setting for which human experiences are attached to. These environments have an impact on our sensations, our feelings, our general movement patterns, community participation and general wellbeing. The buildings that surround us generate meaning shaped through signs and symbols which we associate with as we experience them through any of the sensory systems. Places are established or adapted through the development of these buildings by people in power and with specific interests which in turn affects our degree of access to, and the way we use those spaces. In terms of the aesthetics of a place, buildings represent more than merely objects in people's lives. They are infused with meaning and character, symbolizing people's past, their relationships with others, and common experiences with

their families, friends, communities, sub-cultural and broader cultural affiliations (Butterworth, 2000:6). An example of this place attachment can be drawn from when a family relocates to a different town, or is forcefully removed for some reason or the other, they experience feelings of grief and loss due to the memories and encounters left behind from 'home'.

Sense of community is a further association of the built environment, traditionally explained as a feeling that members of the same geographical region, such as a city, town or neighbourhood have of belonging and a commitment of togetherness where individuals or groups matter to one another. However, in contemporary society the sense of community has grown in becoming a symbolic interaction between people, through enhanced communication technology and mobility, as they engage with aspects of the built environment. (McMillan and Chavis, 1986:9). Consistent with McMillan and Chavis (1986), a sense of community consists of four elements: membership, influence, integration and fulfilment of needs and collective emotional connection. The first element, membership, is regarded as the feeling of belonging. Secondly, influence is a person's knowledge that their membership is of substance to the group. The third component, integration and fulfilment of needs, is the satisfaction people attain by acquiring what their necessities are by being part of the group. The final element, shared emotional connection relates to a shared connection in terms of history, time, symbols, places and experiences. Therefore, a sense of community according to Chavis and Wandersman (1990) endeavours to exemplify the relationship between individuals and their social structures (Chavis & Wandersman, 1990:56).

Moreover, the concept of iconism with respect to architecture can also be seen as a contributor for social identity through its depiction of communities as cohesive. This can be explained through the theories of place as discussed above, semiotics, which will be further elaborated on, and perception as a whole. The existence of an icon physically is an essential feature of iconism as it marks distinctive forms and technological innovation. Today, and historically, remarkable buildings and structures impart their presence on the landscape, providing sovereignty to many cities and communities across the globe and contributing to national identity (Hoffmann, 2012). Icons in the present day especially, undertake the responsibility of providing an identity for every aspect of society rather than just buildings in the corporate field (Hoffmann, 2012: 5). The Moses Mabhida Stadium in Durban, South Africa serves as an example of an iconic building for the citizens of Durban. The most iconic part of the building is the arch which can be interpreted by the diverse ethnic population as a unifying rainbow. From above, the arch form is reminiscent of the 'Y' shape on the South African flag thereby incorporating part of the culture and giving it meaning by the use of architectural signs. This gives the form of the stadium a unique design and a strong mental image

on the Durban skyline. In addition to the physical and representational elements, the stadiums role in hosting the 2010 Soccer World Cup played a major part in giving the building iconic status. This world event contributed to widespread recognition of Durban and South Africa fostering a sense of togetherness and community. The station now stands as a great memory of a special time when a multitude of people united to celebrate as a nation, which caused the public at the time and currently to have a sort of psychological attachment to the place and to the building. Thus, the Moses Mabhida Stadium is a meaningful icon to the vast majority of people in, and out of Durban. The combination of the physical presence, the representational elements and the meaningful experience associated with the stadium makes this iconic building unique. The example of the Moses Mabhida Stadium is a clear illustration of the capacity of an iconic building to be used as a tool for social identity.

Figure 3.7: The Moses Mabhida Stadium as an icon in Durban, South Africa.
Source: Armand, 2017

Hence, the function of buildings in the environment is not limited to mankind's physical needs, such as shelter and thermal comfort, but in addition, should cater for their emotional needs. Architectural features, such as visual appeal, acoustics, spatial quality, materiality and geometry, which have an effect on people's mental processes, need to be treated more sensitively. Ultimately, by taking these into consideration, it could foster more liveable, sustainable, efficient, safer, and healthier physical environments.

3.6 IDENTITY AND SEMIOLOGY IN THE BUILT ENVIRONMENT

Semiotics can be defined as a way of understanding the assembly of meaning in the built environment. Krampen, (1979: 1) states that with the intention of interpreting meaning in the environment, a semiological approach is needed in understanding what processes are involved when meaning is perceived or attributed to an entity. Semiotics, further defined as the theory of signs, is considered the fundamental science of human communication (Baird, 1969: 7). In addition, semantics - semiotics and meaning are connected to the subject of language, the means of agreed upon guidelines to communicate. As mentioned earlier, communication is vital in mediating the co-constitutive relationship between identity and perception. The relationship between objects and language, architecture being the object, are the common backgrounds to mankind's developments. A labourer purposefully learns to assemble materials in the creation of a product or object. Likewise, language is also learned by society and produced by man in a purposive manner. (Krampen 1979: 13)

Nelson Goodman (1968) in 'Languages of Art' delivers a theory of symbolism that creates rational identity principles by theorizing four interconnected aspects of representation which is, denotation, exemplification, metaphoric expression and mediated reference. When viewed holistically, these aspects explain the existence of diverse layers of interpretation. Representation and denotation are similar in that they both offer relational meaning, however, expression is self-reflexive implying that it refers back to itself in deciphering meaning. Exemplification and expression together, can be understood as a mix of symbolizations. The Lincoln Memorial in Washington D.C serves to explain how different layers of representations may exist. Denotation is where meanings are denoted directly by extracts from speeches carved into the wall or by the presence of the statue of Lincoln himself (Fig.3.8). Exemplification is where the solid-void rhythm on the buildings east facade draws attention to the centre and to the statue of Lincoln even from a distance as a result of the urban design central axis (Fig. 3.9). The metaphoric expression of the building is used powerfully by the memorial being architecturally treated as an analogous temple with Lincoln representing the deity further emphasised by the message carved into the wall (Fig. 3.8). Finally, the fourth representation of meaning, that of mediated reference is the sequence of reasoning resulting from the deification of Lincoln whereby he is seen as the saviour of national unity and the basis of advancement for civil rights. Hence, many of the civil rights protests are conducted in front of the Lincoln Memorial. (Vale, 1992:5)

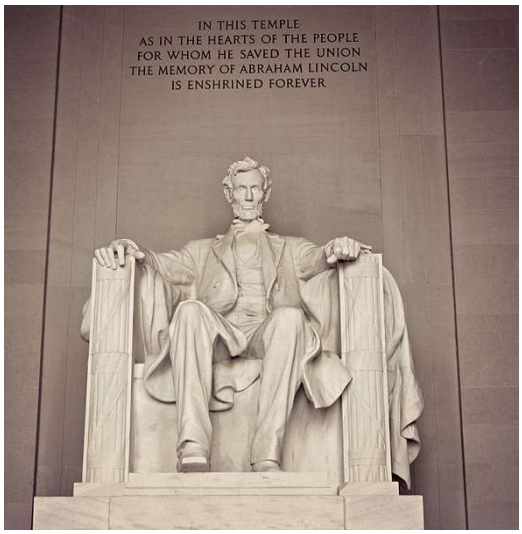

Figure 3.8: Lincoln memorial temple as a metaphor. Source: https://commons.wikimedia.org/wiki/File: Lincoln_Memorial_Statue.jpg [Accessed 20 May 2018].

Figure 3.9: Exemplification of architectonic properties. Source: https://listosaur.com/history/5-surprising-facts-lincoln-memorial/ [Accessed 20 May 2018]

These distinctions of the multiple representations are necessary in order to avoid inaccurate attributions of meaning in the built environment. The built environment in terms of identity does contain meanings which therefore requires knowledge on how to interpret those meanings. Linking Goodman's theories on the languages of art and the ways of worldmaking permits the establishment of a framework for ascertaining a buildings identity.

In 'Ways of Worldmaking', Goodman (1978) suggests that there are many versions of the world. He builds on the theory of symbolism by stating each worldmaking organization as symbol systems, which in turn are referring systems fundamental to the perception, understanding, and construction of the world's we experience. Additionally, Goodman (1984), in explaining how buildings develop meaning, evaluates three interpretative systems- absolutist; relativist; and deconstructionist. Firstly, the absolutist system considers the idea that a buildings meaning can have one interpretation based on the identity and intention of the architect. Secondly, the relativist view opposes the absolutist system by stating that there is no fixed interpretation and every interpretation of the meaning could be right. Finally, the deconstructionist system refers to all interpretations as a narrative whereby it avoids the unnecessary search for the absolutist single interpretation, also resulting in the outcome that every interpretation may be correct.

Goodman (1985) discards the absolutist system completely and progresses past relativism and deconstructionism, towards a constructive relativist standpoint. This interpretive system views some of the processes as unsuitable and makes use of the deconstructivist approach to restructure an

interpretation of a building that acknowledges the provisional meaning of a building. The authors exploration of the effectiveness of a building as an artefact relies on how the embodied formal components of the architecture relate to each other and as a collective entity, also how it denotes, expresses or refers.

Therefore, it can be evaluated that there are no guidelines responsible for discovering meaning, however Goodman (1985) suggests the types of meanings that can exist. An architectural composition that an individual or group may experience physically, has an effect on the multi-sensory organs and cognition, transforming, modifying, informing, and reorganizing experiences, specifically, to reshape visual outlook, feelings, conception, and comprehension of the world.

3.7 CONCLUSION

The mediating processes of sensation and in particular cognition which influence the multiple interpretations of the phenomenon of perception were discussed in the above chapter. It depicts the multi-layered nature in discovering the relationship between the world of human perception and the built environment. Overall, the qualities of the built environment can be understood through mediation from within the observer through psychological and bodily experiences in realising meaning. As stated by Pallasmaa (2005: 71), the eternal role of architecture is to create embodied metaphors that structure and fix our existence in the world as the physical environment allows us to understand, shape and remember who we are. Architecture facilitates our perception and understanding of the contentions of perpetuity and variation, to settle in the world, and to be situated in the continuum of culture and time.

CHAPTER FOUR: PERCEPTION AND THE URBAN ENVIRONMENT

4.1 INTRODUCTION

Merleau-Ponty (1962) describes perception as a foundational quality of human experience, but it is not limited to aspects of experience, it also has certain behavioural (Bartley, 1958) and emotional effects (Norberg-Schulz, 1965). As discussed previously, the perception of built environments not only affects people's experiences of the space but also affects their behaviours and emotions. This highlights the importance of the correlation between perception and the built environment. Public transportation infrastructure is a significant part of any urban environment however, it is attended to in a very functional way whereby it is focused on the task of moving people rather than on user's perceptions. Therefore, this chapter will discuss the perception and identity issues of the urban environment with respect to the public transportation industry.

4.2 ARCHITECTURE AND IDENTITY

According to Abel (2000: 141) there exists vast similarities between the formation of personal and social identities, and architectural symbolism. The relevance of architectural identity has reached a stage where the concept now counterparts architectural language, and architectural space, as one of the principal subjects in architectural discourse. Hence, practitioners of the built environment have a significant role to play for the way in which they redefine the identity of cities, as any development to ones surrounding impacts the way they see themselves which in turn affects one's identity. The city is ever changing, moulded by various hands and minds, rather than a static urban form. (Lynch,1960: 2)

A study by Lawrence Vale titled 'Architecture, Power and National Identity' (1992) attempts to analyse the concept of identity through studies of civic buildings and how politics and power incidentally are a crucial part of it. National identity is not something practitioners involved in the built environment can firmly control or shape, as all architectural symbolism is subject to different interpretations. However, architecture and urban design can direct the societal meanings by becoming symbols itself, in the reflection or construction of national identity. As stated by Vale,

> "not long after the Lincoln Memorial was built in Washington DC, its image displaced the words one cent from the centre of the American penny. Likewise, on the nickel the head of Thomas Jefferson is backed by the image of his home, Monticello. These two buildings and a

few others in and around Washington DC, not only are associated with individual statesmen but have become infused with the symbolism of American democratic government."
(Vale, 1992: 48)

Figure 4.1: The Union Buildings. A powerful symbol of the power and dominance of first the English then the Apartheid Government and now houses the Government of the New South Africa.
Source: https://www.brandsouthafrica.com/people-culture/arts-culture/the-union-buildings-now-a-national-treasure [Accessed 20 May 2018].

Brian Kearney and Sabine Marschall argue in the book 'Opportunities for Relevance' (2000) that to create an architectural identity that reflects all cultures, some kind of abstraction is required. Nevertheless, if a building is abstracted beyond a point of reference, it becomes neutral in terms of culture, and a resistance against the building may form. According to Marschall and Kearney (2000: 154), the challenge is to abstract in a way that builds on what is present without exacerbating interethnic tensions by contributing to an existing nation thereby developing a rich ambiguity. In this way, the building is neither monofunctional nor does it seem so neutral that it can be placed anywhere (Marschall & Kearney, 2000: 154). Essentially, successful architecture is that which relates to the context of that society and the identity of those it encompasses (Davids, 2007: 34). In terms of the public transport industry's identity, the above statement is particularly relevant as the industry comprises of a variety of groups, all with their own identity, culture and ethnicity. However, careful consideration needs to be taken to design for a balance of all these groups, if not, the design may respond to only one specific group or even may be unidentifiable to society as a whole. As a result, in line with Marschall & Kearney (2000), abstraction is required.

Rem Koolhaas (as cited in Pearson, 1996: 19) opposes the expression of identity by stating that it is possible identity may be restricting, and the shedding of identities should be considered. In this way, the loss of identity provides a blank slate for architects and urban designers to work with,

leading to a liberation of the design process. In contrast, identity is one of the integral parts of society and essence of a culture. Thus, the removal of this aspect may lead to meaningless architecture as any innovation should be driven by the context and society as mentioned above. In addition to the view of Rem Koolhaas (1996) with regards to identity, a culturally neutral approach to design has also been suggested. However, these notions are undesirable as society shapes architecture and architecture shapes society (Foucault, 1993: 169). This represents the co-constitutive relationship between architecture and society.

Therefore, the projection and representation of cultural imagery and symbols is of vital importance in architecture. For instance, the use of vibrant colours associated with African culture have been used to express identity in African architecture. On the contrary, people may perceive them in different ways subject to their identities and interpretations. Hence, meaning in architectural expression should aim for a deeper translation with respect to the typology and basic patterns of space making, and the articulation of the facade (Marschall & Kearney, 2000: 154). Vale (1992: 279) states that a building can avoid being the image of a moment in cultural or political history, only if it is able to adapt to the rapidly changing society around it.

Pluralism or hybridity may be the solution to the dilemma of the representation of culture and identity. It can be defined as a system that recognizes no single dominant culture, but rather is a structure in which all groups or lifestyles coexist. Apartheid in South Africa stood in contrast as it warped identity while Pluralism celebrates the components that make up national or regional identity by offering solutions as to how commonalities can be utilised between all cultures in a shared context.

South Africa post-apartheid has facilitated and embraced peoples' individuality and differences. According to Jencks a positive identity can only be promoted through mutual dialogue where differences are respected (Jencks, 1993). Jencks suggests an architecture that is heterogeneous and challenges supremacy, one that encompasses the acceptance of the multitude of voices in a city, and makes great encounters from their interaction. (Jencks, 1993: 75)

4.3 PUBLICNESS AND A CULTURAL LANDSCAPE

It has been established that people's perception of a particular space differs depending on their different backgrounds and experiences. The exploration of the idea of publicness is relevant as the research is concerned with the influence of 'public' transportation infrastructure. The concept of publicness aims to ascertain the factors that make one space appeal more to users than others. The level of publicness differentiates from person to person, just as one public space does to another. Furthermore, a private space may be perceived as more public than a public space. In order to understand publicness and address the discrepancy between private and public, the concept of publicness is often reduced to a set of core dimensions (Fig.4.2). However, these guidelines over rationalise publicness whereby the complexity in the relationship between the space and the person is hardly evident. However, these core dimensions, although may be irrelevant to the field of architecture, do establish the basis of the theory. Oldenburg's (1999) idea of third places together with the idea of cultural landscape as suggested by Hajer and Reijndorp (2001), helps to add an intangible complex layer to the field of publicness.

Madanipour
Access
Agency
Interest
Kohn
Ownership
Accessibility
Intersubjectivity
Nemeth and Schmidt
Ownership
Management
Use/ Users
Varna and Tiesdell
Ownership
Physical Configuration
Control
Civility
Animation

Figure 4.2: Table of Core Dimensions of Publicness as identified by Madanipour, 1999; Kohn, 2004; Németh & Schmidt, 2011 and Varna & Tiesdell, 2010

Oldenburg in 'The Great Good Place', explains how essential third spaces are in fostering social interaction. A third space can be seen as a space where neutral exchanges between heterogeneous groups of people occur. Third spaces are social surroundings that extends the boundaries of interaction into a more private realm including spaces such as coffee shops, restaurants, parks, libraries etc. Oldenburg further states that third spaces include certain qualities such as comfort, affordability and accessibility which coincides with some of the principals regarding publicness. Other attributes of third spaces as mentioned by Oldenburg are that they should be welcoming, free or inexpensive, and regularly visited by users supporting new and old relationships. Furthermore, a sense of ownership to third spaces is emphasised. (Oldenburg, 1999)

Hajer and Reijndorp (2001), contribute to the concept of publicness by referring to a cultural landscape as being the embodiment of good public spaces. The typical design of public spaces is

often a replication of previous successful public spaces, with an aim of improving on aesthetics. As a result, public spaces lack soul due to the missing layer of cultural configuration thereby limiting the experiences of the user. Cultural configuration looks beyond the functionality of the space but rather focusses on creating heterogeneous spaces that allow positive frictions to happen between cultures. According to Hajer and Reijndorp (2001), frictions are necessary in activating a public space, which in turn increases the degree of publicness of the space.

These frictions take place when there is an overlap of subcultures and when different social groups are encouraged. Phenomenology of the space as mentioned in the previous chapter, is taken into consideration along with the cognizance that the experience of the space will differ for each person. If a public space caters for only one particular group as opposed to collective, this frictionless space would degrade the level of publicness of the space (Hajer and Reijndorp, 2001). Similar to the concept of third spaces, designers should look beyond public and private ownership by creating a sense of belonging and ownership to the users of public spaces (Hajer and Reijndorp, 2001). Therefore, public spaces would develop a meaning to the users over and above the functional aspects of the space.

In Boxpark London, BDP architects have been able to create an environment around the Ruskin Square precinct in Croydon that fosters publicness. Boxpark is constructed of 96 retrofitted shipping containers arranged around a covered courtyard space as a central focus together with outdoor terrace spaces. BDP's design creates a modern-day piazza which is the area's main attraction for people to socialise and enjoy a variety of food, drink and free events. The change of levels in the scheme allows accessibility from multiple entrances adding spatial hierarchy and interest. The raw aesthetic of the scheme is uniform with Boxpark language creating a strong visual identity which is applied consistently throughout the design. This example demonstrates how spatial qualities through architectural design have the potential to influence publicness and perception of a space.

Figure 4.3: Boxpark, Croydon.
Source: https://www.archdaily.com/tag/croydon [Accessed 24 May 2018].

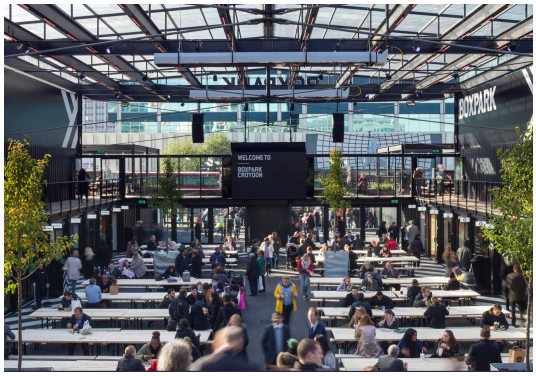

Figure 4.4: Covered Courtyard space / Modern-day Piazza.
Source: https://www.archdaily.com/tag/croydon [Accessed 24 May 2018].

4.4 THE PERCEIVED TRANSPORT SECTOR

4.4.1 **Introduction**

This section of the research will aim to understand the significance of transport in the urban environment. This will be done by investigating contemporary issues regarding transport and its development which include environmental, economic and movement patterns. Thereafter, on the basis of the knowledge regarding the transport industry, intermodal transport development will then be introduced.

As Cox (2010:17) mentions, transport allows inhabitants of a city access to essential services which may enhance the quality of life. Therefore, this segment highlights the need for people to move around cities and specifically addresses the factors that restrict people to move about in cities. International examples will be sought to understand the general image people have of transport globally in order to gain a holistic view of perceptions on transport. The relevance of transportation in the city would clarify the need for a more meaningful architectural approach that would take into consideration the connection between mankind and the environment as discussed in the previous chapters. In addition, this chapter outlines the need for most cities to recognise public transport infrastructure as a valuable entity and to be afforded more careful attention when it comes to implementation.

4.4.2 **Challenges facing the transport industry**

Transport has a significant impact on the economic and spatial development of cities. As Banister and Lichfield (1995) mentions, the attractiveness of a specific place is partly dependant on accessibility, which in turn depends on the efficiency and effectiveness of the transport infrastructure. The nature of cities is changing due to population shift out of the centre in the desire for lower residential and job densities, and increased suburbanization. As a result, movement patterns are altered whereby public transport or local based journey to work patterns are replaced with longer distances and dominance of automobiles as the primary mode of commuting. The movement of people away from the centre is caused by higher income levels, increased car ownership and also the lack of affordable housing in city centres (Banister and Lichfield, 1995: 2). Furthermore, shopping centres, industrial parks and leisure facilities are placed on peripheries of urban centres, where densities of development are low and access is primarily by car. The response

has been to invest in new road links to accommodate the new demand. However, this may result in increased traffic, further suburbanisation and decay of the city centre (Banister and Lichfield, 1995: 2). The city centre has also suffered due to town planning regulations which demands an excessive amount of parking for private vehicles to be catered for in built forms within city centres which wastes the opportunity for the space to be utilised for a variety of other functions which could contribute to the public realm (Fig.4.6).

Figure 4.5: Suburban development and highway in Colorado Springs.
Source: https://en.wikipedia.org/wiki/Suburbanization#/media/File: Suburbia_by_David_Shankbone.jpg [Accessed 2 June 2018].

Figure 4.6: Multi-storey parkade in Durban CBD, South Africa.
Source: http://www.deltafund.co.za/pine-parkade/ [Accessed 5 June 2018].

Many cities are aware of the problems arising from car dominance and increased road networks, as it also imposes financial costs on people and has negative impacts on the environment. For instance, the problems caused by increased traffic such as noise and air pollution due to excessive fumes are critical and affects the nature of the street and people's well-being. According to the World Health Organization statistics, an estimate of 4.6 million years of life lost and 0.8million premature deaths are caused by urban air pollution (Roychowdhury, 2006 as cited in Cox, 2010:33). Road accidents is another major issue which is a resultant of automobile dominance causing over a million of deaths worldwide (Dora 2006, as cited in Cox, 2010: 33). The reliance of the automobile may also cause health concerns on city dwellers, resulting in obesity due to inactivity. Hence, the decisions made on how people move around in cities have an impact on the overall quality of life. Converting the users of private automobiles to public transport, cycling and walking will contribute to protecting the environment in a global context. Additionally, a greater degree of safety and stress-free commuting is provided by public transport. In order for there to be a reduction in the use of private cars, it is vital for cities to be promoted as attractive places to live in with a rich quality of life.

4.4.3 **Transportation as a tool for urban regeneration**

The task of moving around in cities is becoming increasingly difficult. Along with the demand for homes and work, roads and transport are also some of the key areas which are have become a necessity. It is therefore critical for it to be acknowledged that the making of liveable communities will lead to a higher quality of life and create a more sustainable transportation network that fulfils the needs of communities.

Transit oriented development (TOD) has gained popularity internationally as a model which can provide a strong link between urban development and public transport, promoting more sustainable city fabrics. It is essentially an improvement to basic mobility by increased deliberation on public transport infrastructure (Bickford, 2006: 13). Peter Calthorpe laid claim to the concept of TOD in the 1980s, when there was an advancement in urban planning related to the effect car dominance was having environmentally, socially and financially on urban growth. Urban practitioners began to promote development of the city, founded upon ideas from the pre-automobile era, such as new urbanism or smart growth (Carlton, 2007). Transit-Oriented Development includes five key design principals listed below: (Morris 1996; Renne 2009)

Figure 4.7: Principals for a better urban environment. Source: https://www.itdp.org/what-we-do/eight-principles/ [Accessed 5 June 2018].

- Streets feature traffic calming measures to control vehicle traffic speeds, and has good connectivity with surroundings.
- The amount of land attributed to parking is reduced compared to typical development.
- The environment is designed for walking and cycling, has desirable street conditions with adequate facilities.
- Transit stations are placed conveniently with importance placed on comfort and security offering a variety of retail stores along with waiting areas and sufficient ablution facilities,
- Mixed-use facilities surround the development including schools, shops, recreational facilities and other public services, with each neighbourhood accommodating a variety of housing typologies.

TOD is such a development organised around public transport systems so that it allows people within the development the ability to accomplish their routine tasks by walking, cycling, public transport or with limited use of private automobiles. Originally, the idea was focused around rail infrastructure however, according to numerous commentator's, BRT systems (Bus Rapid Transport) provide great opportunities for TOD (Cervero and Dai, 2014; Cervero, 2013; Cervero and Kang, 2011; Currie, 2006; Hook et al, 2013).

TOD features numerous benefits such as increased choice of travel, greater accessibility, reduced transportation costs and a reduction of the amount of land that is paved for roads and parking facilities in urban areas. Moreover, TOD results in neighbourhoods becoming more of a pleasant environment to live in socially and physically. The advantages of TOD economically, include increased property values and higher commercial activity thereby expanding tax revenue (VTPI 2010). In addition, TOD can benefit all classes of people particularly lower income individuals who do not possess a car, by increasing their household affordability and their excess income leftover after expenses.

A good example of TOD as a tool for urban regeneration can be found in Curitiba, Brazil. As part of the city's regeneration programme, the transport system was structured into transport corridors which incorporated high density development into its development plan.

Figure 4.8: BRT network in Curitiba, Brazil.
Source: http://thecityfix.com/blog/understanding-bus-rapid-transit-oriented-development-erik-vergel/ [Accessed 5 June 2018].

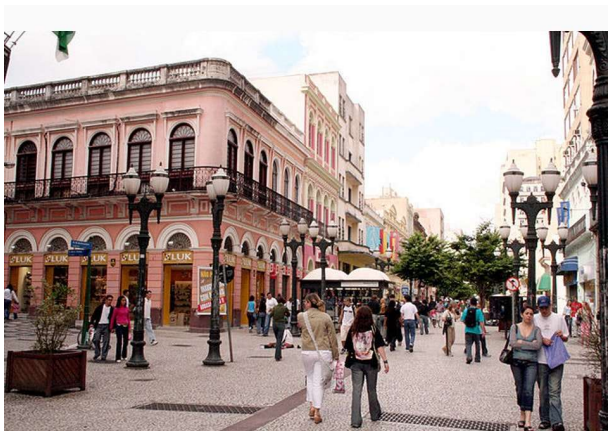

Figure 4.9: Pedestrian street in Curitiba, Brazil.
Source: https://www.afar.com/travel-guides/brazil/curitiba/guide [Accessed 5 June 2018].

4.4.4 **Public Transport Architecture development**

From a historical perspective, the industrial revolution brought about many innovations including an improved means of transportation of people and goods in the form of the railway because of its loading capacity. This invention prompted the introduction of a new architectural typology, the railway station. The steam railway locomotive, a product of Richard Trevithick together with James Watt's steam carriages was initially used as a means of transporting the coal and ore from the mines. Thereafter, it was used as a form of public transportation. Thus, engineers who were the practitioners that dictated transport infrastructure at the time, had to design large span buildings that would accommodate the new transportation system. This resulted in large span steel structures composed of iron and glass and with less regard attributed to people and the experiential quality of the building. As Edwards (1997) mentions, there were no links between the engineering triumphs, the complexity of functions or the human scale and movement (Edwards, 1997: ix).

The railway station proved a challenging task for architects in the 19th century as no precedents of transportation typologies existed prior to railway station development. However, the inception of the railway station allowed a form from which other public transport modes adopted (Edwards,2011: 26). The Saint Pancras Station in London exemplifies the first exploration of large clear spans in railway stations which was achieved by the introduction of the arch form. This allowed an uninterrupted flow of people as well as other additional railway services within the station. These facilities took the form of an elaborate office block indicating the rail company's headquarters, or a hotel that stood as a well decorated frontage to the station with a powerful architectural expression (Fig. 4.11). (Edwards, 1997:21).

Figure 4.10: The arch form achieving large spans.
Source: https://www.railway-technology.com [Accessed 6 June 2018].

Figure 4.11: Articulated entrance of St Pancras International.
Source: Brian Edwards, 2011

In the 1960s, the image of the railway station in terms of its architectural expression, its level of interior design and graphics became more important partly in response to the perceived weakness of public transport as a result of the convenience offered by the car. Consequently, by the 1970s, railway stations became a symbol of national identity, which were followed by other public transport buildings such as airports, with continents becoming developed because of the expansion of railway stations and airports in the nineteenth and twentieth century respectively (Edwards,2011: 32). The public transport stations enriched the city giving it a 'symbolic presence' (Brunner, 2010:24). However, these developments lacked social and environmental considerations as they were driven only by economics. Furthermore, these advances were short of an integrated transport network.

The Atocha Station serves as an expression of monumental architecture in Europe and an inspiration to today's designers. The city of Madrid developed the station after identifying the economic potential of rail infrastructure as a form of urban regeneration. The station features a symbolic facade that acknowledged the values of the city and additionally includes a public space. Furthermore, the interior of the station features a botanical garden. Although the garden does not generate renewable energy, it is a distinct feature of the station and a tourist attraction which in turn generates revenue to the station and its surrounding context. Besides the public space, the articulated façade and the botanical garden, the train shed which houses the platforms provides a sense of airiness by having three sides of the shed completely open with expansive spatial quality.

Figure 4.12: Monumental façade and public square.
Source: Brian Edwards, 2011

Figure 4.13: Botanical garden at the Atocha Station.
Source: https://inhabitat.com [Accessed 6 June 2018].

The train shed structure is separated from the monumental station building allowing a transition and a sense of movement from the urban realm to the railways (Olla, 2014:61). The roof structure of the train shed consists of multiple lines of clear openings allowing daylight to stream through it which enhances the quality of space (Binney, 1995: 93) Ultimately, the station depicts how stations can promote social integration by the facilities it offers while enhancing the users sensory experience in enriching the perceptions of public transport.

Figure 4.14: Spatial quality of the train shed.
Source: https://www.google.com/maps/contrib/ [Accessed 6 June 2018]. Boris Cheng, 2018

At present, due to the rapid population growth of cities, it is imperative that public transport not only functions well, but also satisfies the user aspect of daily travel. Thus, public transport has become more than just a commute, with architects working towards public transport becoming a lifestyle rather than an obligation. The idea is for commuters to engage in activities while they wait, making it possible to eat, shop or get inspired by art, which allows them to experience life in motion (Little, 2015).

Figure 4.15: Artwork as a form of inspirational commuting in Stockholm, Sweden.
Source: https://freshome.com/urbanization-affecting-architecture-transit/ [Accessed 7 June 2018].

Figure 4.16: Cathedral Toledo Metro Station in Italy appears as if a glowing sky is drawing the user in.
Source: https://freshome.com/urbanization-affecting-architecture-transit/ [Accessed 7 June 2018].

As urbanization becomes progressively more dependent on public transportation infrastructure, there exists an innate need for people to be attached to their natural environment which architects have responded to by integrating it into design as seen in the Atocha station (Fig. 4.13). Therefore, while ease of travel and efficiency is essential, it is also significant for people to be connected to the natural surroundings as they move through the urban environment. Furthermore, architects are recognising the need not only to link mankind to the natural environment but to also implement sustainable solutions to transportation systems, as it has a direct influence on the health of a city and its inhabitants. (Little, 2015).

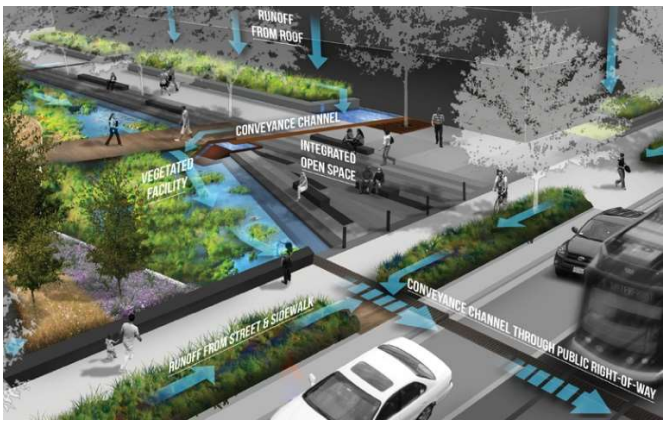

Figure 4.17: Green Infrastructure in the urban environment. Source: https://www.asla.org/sustainabletransportation.aspx [Accessed 7 June 2018].

Image of Public Transport facilities

Modern public transport architecture expresses characteristics such as spatial hierarchy, the use of artificial and natural light, and valiant construction techniques appropriate to the technological advancements of the time. According to Edwards (2011, 36), “technology is seen as holding the key to wider architectural expression”. In doing so, the architecture of transport facilities becomes an abstract icon that forms an orientation point in the city, identifiable to both local and foreign users. These are necessary features in the design of transport facilities, as they enhance the experience of its users by creating perceptual markers in the landscape (Edwards, 1997: 94). In addition, these characteristics help to create symbolic architecture for the inhabitants of the city, contributing to a new outlook of public transport.

An iconic building through bold or unconventional imagery may attract the attention of the public. This is relevant as an outcome of this dissertation is to challenge the mind-set of the public towards the use of public transport. Many examples of iconic transport architecture already exist around the world that form urban landmarks, with motive behind their image either relating to their context or function to avoid the dilemma of placelessness. The function of a public transport facility should always take precedent over the form, however, chances should be seized to design a building that will create interest and attract new users to public transport (Naroth, 2010 :35).

The World Trade Center Station in New York designed by Santiago Calatrava provides an excellent example of the expressive use of transport architecture which forms an integral part of the landscape and combines the articulation of function and form. The buildings pronounced form is achieved through the recurrence of white steel ribs which unites the complex composition and forms the structure of the design, while providing beauty and dignity to the building. The use of glass between the ribs allows generous natural light to penetrate the facility which contributes to the architecture itself having the ability to act as a powerful symbol of vitality. Overall, the building stands as memorial of the 9/11 attacks and demonstrates the use of context in determining form albeit in an elaborate manner.

Figure 4.18: Form envisioned by the architect to symbolise a dove released from a child's hands as one of the many interpretations of the stations appearance.
Source: https://www.archdaily.com/783965/world-trade-center-transportation-hub-santiago-calatrava [Accessed 8 June 2018].

Figure 4.19: The expressive use of natural light and airiness in the terminal with an operable skylight that opens on the 9/11 anniversary and on temperate days to bring the sky into the building.
Source: https://www.archdaily.com/783965/world-trade-center-transportation-hub-santiago-calatrava [Accessed 8 June 2018].

Inter-modal transport development

An inter-modal transport hub also referred to as a transport interchange is a new form of transport typology which connects various modes of transport into a single whole, with emphasis on the user apart from the infrastructure which in essence brings the public together. Previously, prominence was given to engineering to create networks of facilities to serve the public. Transport Interchanges are key to success in achieving sustainable cities as it has the ability of stitching together transport infrastructure along with people. However, it has been argued that sustainability can only be achieved if the public is put first, together with their social and cultural needs. The generous concourses of transport hubs attract both wealthy and poor, old and young, local and immigrant, and those who are able bodied and those disabled. Edwards (2011), views public transport interchanges as an 'urban magnet' or having the capacity to act as a new form of community hub. Thus, transport hubs are complex places socially that allow a mix of cultural configurations to overlap offering an increase of positive friction, which is vital for the creation of an embodied public space. This view allows a more enriched user experience of transport architecture whereby the architect is involved together with other technical practitioners of the built environment in creating an enhanced public realm and a positive living environment (Edwards, 2011).

Figure 4.20: Birmingham New Street Station external plaza showing the priority given to pedestrians. Source: https://www.archdaily.com/780568/birmingham-new-street-station-azpml [Accessed 12 June 2018].

An interchange generates a continuous flow of people, which provides the foundation for economic activities to happen. Thus, it is noteworthy that a transport hub can have various spheres of influence, including economic, social, and physical design consideration, which transcends the notion of being simply a building of high engineering standards (Appendix A) (Verster, 2003). The economic and social impacts of a transport hub extend beyond the borders of the interchange when diverted by good urban design to areas in need of regeneration (Taylor, 2011). In doing so, they can serve as a major means of revival for urban areas that are in need of economic transformation. In

respect of sustainable development, the transport interchange allows the prospects of new business districts and the establishment of administrative, cultural, and educational hubs in close proximity to the transport network providing a vibrant public realm. 'The Interchange' in Minneapolis is one of the first examples of an intermodal transit development in the country that successfully integrates culture and transportation. The iconic design, together with mixed use facilities, its central location and constantly active public space arouses a new civic identity and sense of attachment in the community.

Figure 4.21: Transport hub at the centre of sustainable transit oriented development.
Source: http://www.itsinternational.com/categories/detection-monitoring-machine-vision/features/transportation-hub-the-centre-of-sustainable-urban-development/ [Accessed 12 June 2018].

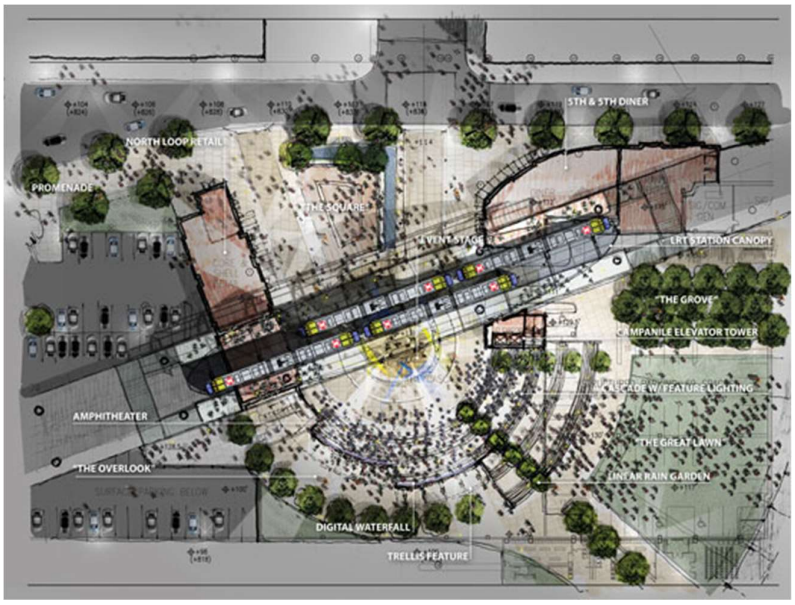

Figure 4.22: Plan showing the range of facilities and public space.
Source: http://www.eekarchitects.com/portfolio/14-mixed-use/130-target-field-station [Accessed 12 June 2018].

June Taylor (2011) in ‘New railway stations as catalyst for regeneration and urban hubs’ states that the art of designing a transport hub involves incorporating the following three functions in a balanced manner –a link within the urban context, an efficient exchange between transport modes, and a destination itself. Taylor (2011) further explains that at transport interchanges it is important that spatial design is understood physically and typologically. They comprise of transport spaces, waiting areas, movement areas, information spaces, economic spaces, and social spaces. It is essential these zones flow into one another to impact on the quality of the urban environment. Furthermore, Taylor (2011) emphasises the flexible quality of sustainable transport interchanges in dealing with new demands such as a change in culture, environmental needs or commercial pressures. The main difference between a transport interchange and single- transport buildings is the extent of movement and gathering spaces both internally and externally due to the demand of space required for the interconnection of transport systems and multiple movement zones. This results in large volumes and concourses that integrate the sub territories required by the different transport types. As such, this large spatial quality makes the transport interchange identifiably distinct from a bus or train station.

Figure 4.23: illustrates the variety of functions and large volumes accommodated for in a transport interchange. Source: https://www.arrow-dragon.com/astana-new-railway-station/ [Accessed 12 June 2018].

Modern transport interchanges today have experienced a loss of user experiential quality and legibility due to consumerism. Natural light and ventilation have been replaced by artificial means and at high environmental cost. The transparency of terminals, and orientation have become obscured by excessive shops and advertising banners resulting in the transport typology being an extension to non-place shopping malls (Edwards, 2011:71). Marc Aude (1995, as cited in Edwards, 2011) refers to the experience of transport buildings as ‘non places’ void of time, place, and culture associated with architecture.

In response, Edwards (2011) argues that the attention to environmental forces, social needs and cultural influences effectively tempers the forces of standardisation and internationalisation which tend to unify the shape of transport architecture. This tempering leads to the provision of a well-integrated transport facility that acts as a gateway to the city, a gateway to mobility and a gateway to sustainable development. Edwards (2011) further explains that the sustainable practices of the grand nineteenth century railway terminals represented the radical use of technology of that particular time period featuring lofty volumes, wide spans sunlit concourses and innovative use of materials in detailed assembly. As such, it is essential designers revisit the sustainable practices of the past in terms of light, structure and detail in making these gateways a memorable experience representative of today's age. A good example can be found in the modern waterloo station designed by Grimshaw which illustrates the well-articulated and innovative structure of the canopy which becomes the architectural identity of the station. Furthermore, the form of the canopy is reminiscent of the original arch form employed in the 1800s in London.

Figure 4.24: The curved skin illuminates the concourse and allows views out into the surrounding environment. Source: https://grimshaw.global/projects/international-terminal-waterloo/ [Accessed 12 June 2018].

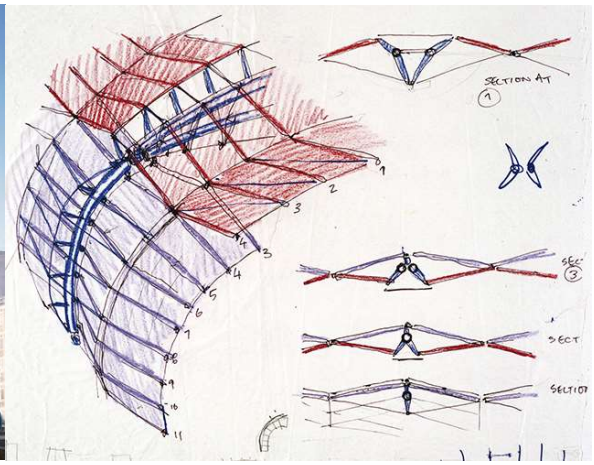

Figure 4.25: The innovative detailed system of struts. Source: https://grimshaw.global/projects/international-terminal-waterloo/ [Accessed 12 June 2018].

The perception of spaces is influenced not only by light, materials and structure but also by visual cues that reinforce legibility of the building allowing the users to have some sort of orientation in the interchange. The five characteristics of perception identified by Kevin Lynch in 'The Image of the City' (1960) namely nodes, paths, edges, districts and landmarks as previously mentioned, can be used to create an imageable interchange in an urban setting. According the Lynch (1960), the transport 'node' can be described as a place in perception terms as it should be designed foremost for the people. Thus, the interchange becomes a memorable location due to increased economic and in particular social interaction. The 'path' refers to the routes to and through the transport interchange that create a delightful experience. 'Edges' are boundaries physically and perceptually

that form transport barriers, for example, a railway line or busy main road that cannot be crossed over. Therefore, it is essential that transport interchanges are designed for edges to be permeable that promote easy accessibility as well as visual links to transport facilities. The ‘district’ refers to the character of the interchange as a whole which comprises of the functional aspects of transport, but also includes the movements of people, distinct to the interchange. Finally, the idea of the landmark refers to the ability of the transport facility as with any civic building, to serve as a marker in the urban environment that helps with orientation to various inhabitants and visitors of the city.

The proposed multi-modal transport hub in Sweden designed by Bjarke Ingel's firm BIG represents Lynchs (1960) key characteristics in design which attempts to reconnect an existing railway station to the city. The design removes perceptual barriers created by the railway tracks by integrating surrounding neighbourhoods and uniting mixed use spaces within the platform. The transport hubs design is influenced by the movement of people, converting transport infrastructural needs into opportunities for social interaction. There are ramps which provide cycle paths from street level, with areas beneath the plaza creating a transparent boundary for the station by the use of glazed walls (Fig.4.28). Furthermore, the roof design which appears to float is slightly elevated at its four corners to create welcoming entrance points, while enclosing the city’s transport infrastructure in a multitude of programmed civic spaces (Fig.4.27).

Figure 4.26: The transport hub as a node that reconnects the urban surroundings while serving as a landmark. Source: https://inhabitat.com/floating-gold-roof-tops-bigs-proposal-for-a-new-transportation-hub-in-vasteras/ [Accessed 17 June 2018].

Figure 4.27: Welcoming entrance points and flow of public life which create a memorable experience. Source: https://www.dezeen.com/2015/06/08/big-transport-hub-vasteras-sweden-trains-buses-taxis-bicycles-redevelopment-3b/ [Accessed 17 June 2018].

Figure 4.28: Enclosed glazed walls creating a transparent boundary and commercial/ retail opportunities for the station.
Source: https://inhabitat.com/floating-gold-roof-tops-bigs-proposal-for-a-new-transportation-hub-in-vasteras/ [Accessed 17 June 2018].

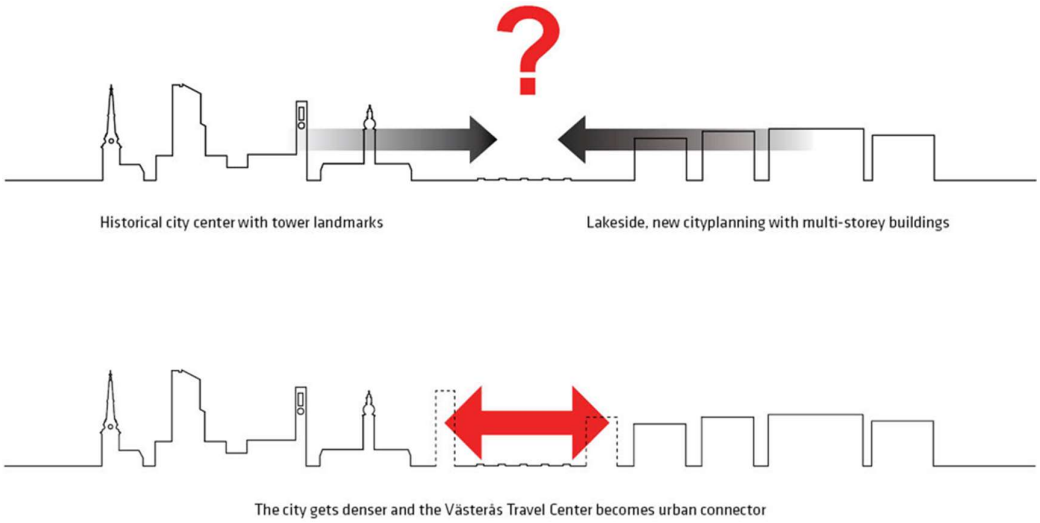

Figure 4.29: Shows how transports hubs can bridge different parts of the urban fabric.
Source: https://www.dezeen.com/2015/06/08/big-transport-hub-vasteras-sweden-trains-buses-taxis-bicycles-redevelopment-3b/ [Accessed 17 June 2018].

From the above, the significance of the transport interchange in an urban environment can be understood. Edwards (2011:3) supports this outcome by stating, “in cities the transport interchange has become a major catalyst of urban regeneration”. This represents how meaningful transport architecture can contribute to sustainable development while impacting positively on the perceptions of people towards public transportation in an urban setting.

4.4.5 **Conclusion**

Modern transport interchanges follow the examples from the first railway station age centrally located around the historic cores of the city where the broad economic advantages benefit the less privileged communities. As a result of the economic and social benefits of transport buildings, the

city gains by the reduced car dependence, traffic congestion and pollution which in turn counteracts urban sprawl. Nevertheless, according to Edwards (2011) transport hubs are one of the challenges of our age in terms of urban design. At present we face the challenge of high speed rail and integrated transport similar to how the 19th century practitioners tackled the introduction of canals and railways into the city. However, as opposed to the developments in the early railway age, it is necessary to aim for sustainable development rather than primary infrastructure provision (Edwards, 2011). It can be summarised that the provision of transport spaces and all-inclusive social spaces in an interchange facility together with high quality materials and well lit spaces, increases the level of respect for public transport. Furthermore, unless public transport architecture provides a hassle free seamless journey and heightens the perceptual experience of its users, the public will not be able to shift from private cars to public transport. Hence, the problem of private automobile dominance, suburbanization and other associated challenges can only be curbed if urban environments are made more sustainable. Yanarella and Lavine (1992) suggest that through meaningful architecture in the built environment, sustainable urban environments can be achieved. Furthermore, given that the world is moulded through cities, an effort to drive sustainable development processes has to be made by city centres, or else sustainability on a global level will never be attained.

4.5 CONCLUSION

In general, the perceptions of public transportation infrastructure can be changed by improving public transport facilities through introducing transit oriented development in the urban environment that integrates pedestrians and walkability on an urban scale and densifying built form. An enriched urban environment in respect to architecture is therefore more than function and utility, but is also about improved public amenity and value through quality spaces, attractive and durable materials and the attention to physical and psychological comfort in interchange areas. The above literature displays through the variety of architectural examples present, the vast insight acquired from grasping the influence of perceptions on built form. The following chapter seeks to look towards international best practice of contemporary transport interchanges as the benchmark to acquire a greater understanding of the principles implemented by these facilities to heighten the cognitive and experiential perceptions of people.

CHAPTER 5: PUBLIC TRANSPORT ARCHITECTURE IN A GLOBAL CONTEXT

5.1 INTRODUCTION

From the previous sections in this dissertation, the phenomenon of perception has been explored and investigated on an academic level. This chapter will investigate the findings discussed in the literature review chapter through selected precedent studies which have been deemed to serve as ideal examples of architectural responses as to how perception influences positive environments.

5.2 OLD VS NEW: KINGS CROSS RAILWAY STATION, LONDON

King's Cross Station was first designed by Lewis Cubitt in 1852 as the heart of the Great Northern Railway. In the twentieth century, there was a significant expansion in transportation together with architecture emerging as a significant force in the development of new construction techniques. Until recently, the King's Cross Station building and the surrounding urban environment sustained continuous pressure to deal with increased passenger traffic and transportation services. This led to makeshift additions in the form of an inadequate 1970s concourse and ad hoc buildings at the southern end of the station obscuring the twin-arched historic façade (ULI, 2018).

Figure 5.1: Shows the crowded 1970s low structure which obstructed the view of the original historic station.
Source: https://www.railway-technology.com/projects/eastcoast/attachment/eastcoast6/ [Accessed 26 June 2018]

The incapacity of being able to meet the needs of modern day travel, has since led to the redevelopment of the Kings Cross railway station in 2012 that has now been revitalised and modernized, and today serves as a landmark for the city of London. The project now includes retail and commercial space, as well as a new public square at the front of the train station and an iconic interior public concourse. Today, King's Cross Station is located at the heart of a major redevelopment district in London, namely King's Cross (ULI, 2018).

The introduction of high speed rail technology allowed the revitalisation of the station to be transformed into a major transport interchange with approximately four transport systems integrated around older facilities. The merging of old and new results in a potential loss of the centre followed by difficulty in the sense of directional flow. Therefore, the challenge faced in the design, was maintaining the legibility of existing arrangements while accommodating additional modes of transport. However, the station responded by creating fluid interconnection through the modification of existing patterns of movement (Edwards, 2011).

Figure 5.2: Shows the fluid interconnection and modification of existing patterns in the redeveloped Kings Cross Station.
Source: Brian Edwards, (2011)

The creation of a new concourse in the vicinity of the old station allowed the opportunity to not only deal with the issue of restricted space in the current station but also to achieve the objective of driving people's views and vista towards the historic façade in respect of the heritage. This was achieved by the attraction of the user's visual system along any of the primary radials of the modern roof structure towards the funnel, to maintain the significance of the old building. The juxtaposition of the new and the old, references the past while surging on into the future. (Fig.5.3).

Figure 5.3: Shows the 21st century grafted onto the 19th century.
Source: https://casestudies.uli.org/kings-cross-station/ [Accessed 26 June 2018].

The Kings Cross Station is regarded as a grade one listed building which means that it is in the top eight percent of historic buildings in the country. Thus, it was essential that the architectural quality of the new work, match the quality of the Victorian station (Pugh,2013). The main idea behind the design of the new Kings Cross Transport hub was to make the passenger journey an experience and not just simply something that is a functional commute from one point to another. The design of the western concourse allows for passengers to have an uninterrupted flow of movement and legibility as a result of structural columns being avoided. In addition, the design of the new western concourse was influenced by the shape of the historic, Great Northern Hotel. The hotel follows the line of the street with the western concourse following the line of the hotel and filling the gap between the station and the hotel (Fry, 2013).

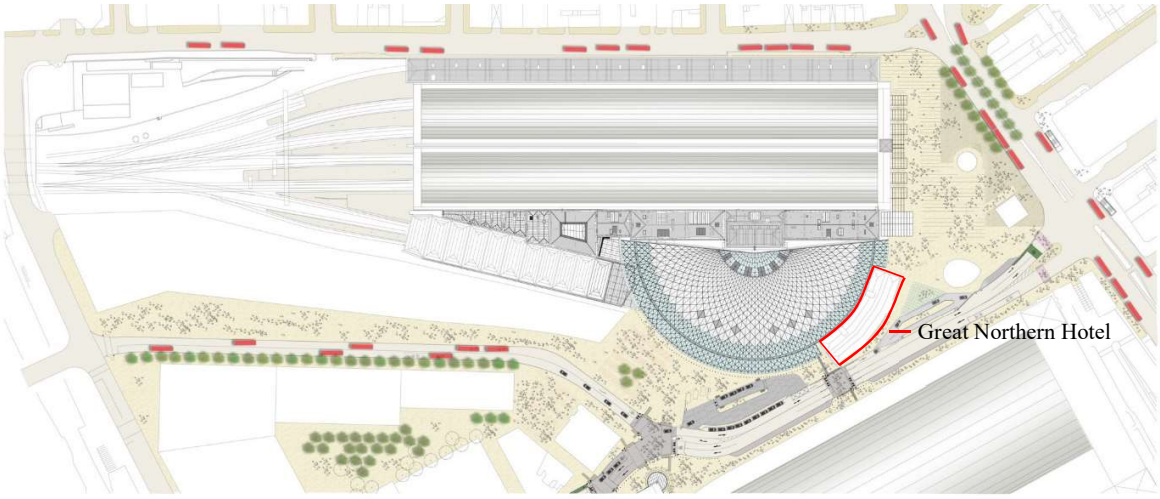

Figure 5.4: Shows the form derivation of the new western concourse and public realm.
Source: https://casestudies.uli.org/kings-cross-station/ [Accessed 26 June 2018].

Furthermore, the design had to factor in the neighbouring London Underground Station allowing compromises or opportunities to arise particularly within the western concourse itself. It was not viable to introduce conventional multi-columned supports through the centre of the concourse, as this would have resulted in a 'forest of columns' in the London ticket hall down below (Fig.5.5) (Aso, 2013).

Figure 5.5: Shows the avertible outcome on the Underground London ticket hall from having direct loading through the new concourse above.
Source: https://www.youtube.com/watch?v=YK4dqwpNrsk&t=2s. [Accessed: 26 June 2018].

Hence, the solution that was sought out was to spread the load around the perimeter of the concourse as realised in the semi-circular design (Fig.5.6) (Aso, 2013).

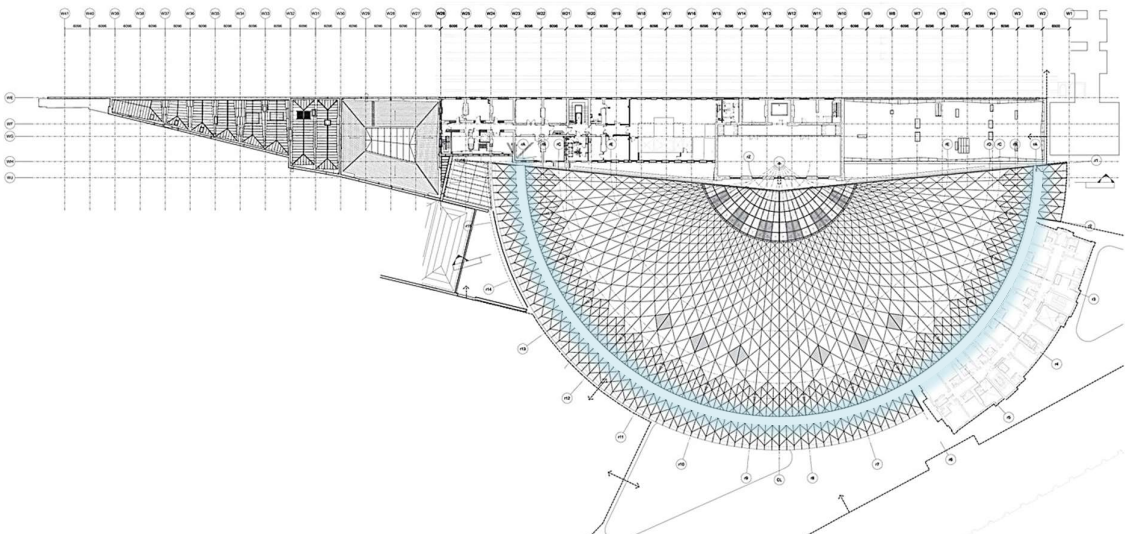

Figure 5.6: Shows the semi-circular shape of the concourse and load distribution of the roof.
Source: https://www.archdaily.com/219082/kings-cross-station-john-mcaslan-partners/5006040228ba0d077900297b-kings-cross-station-john-mcaslan-partners-plan [Accessed 26 June 2018].

The King's Cross station is made up of four primary buildings which comprises of the new western concourse; the renovated western range building adjacent to the new concourse; the refurbished main train shed in the centre where the trains arrive on four platforms, fronted by the historic facade facing a new plaza and; the restored long eastern range building on one side of the tracks situated on the opposite end of the new concourse (ULI, 2018).

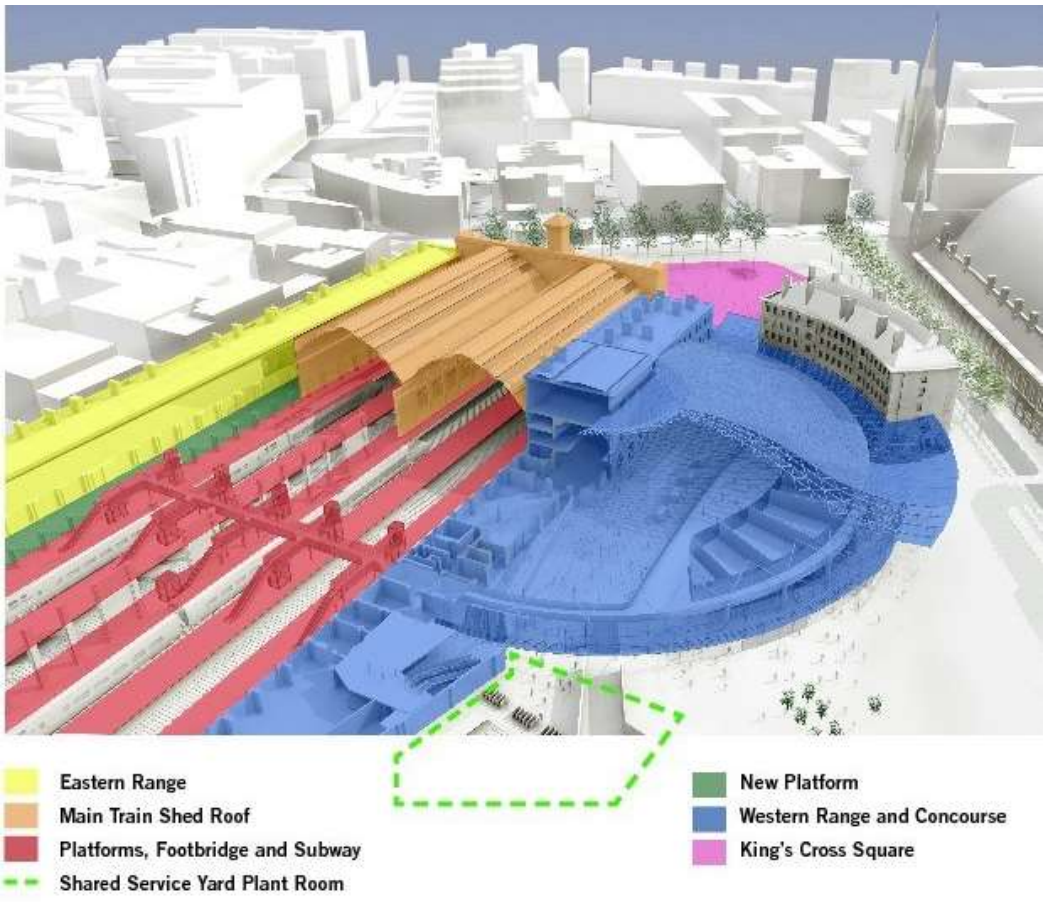

Figure 5.7: Shows the King's Cross Station overview and layout.
Source: https://www.archdaily.com/219082/kings-cross-station-john-mcaslan-partners/5006040228ba0d077900297b-kings-cross-station-john-mcaslan-partners-plan [Accessed 26 June 2018].

The concourse allows people to circulate to the train platforms, and also allows a more relaxed route up escalators reaching a mezzanine where the public can pause from the commuter frenzy by indulging in various restaurants within the voluminous open space. Thereafter passengers may progress from the mezzanine level to a footbridge above the tracks of the main train shed, from which passengers can descend to respective platforms. In terms of functionality, the design smoothens irregularities in past arrangements and expands circulation space thereby improving the overall travelling experience.

The restored and reglazed main train shed roof which has now been stripped of its old polycarbonate sheeting, not only allows natural daylight to penetrate into the space, but also makes the change of environment in terms of indoors and outdoors, a transitional and comfortable experience. The spacious internal arrangement at Kings Cross Station, with its iconic white steel roof structure which has been described as “some kind of reverse waterfall, a white steel grid that swoops up from the ground and cascades over your head” (Arup, 2012), also welcomes daylight into the space, giving it a warm atmosphere. Thus, commuters form a link with the environment while progressing through the building forming a relationship between ‘journey’ and ‘dwelling’ whilst experiencing a sense of enhanced perception (Coetzee, 2012). In addition, the semi-circular skylight provides attractive shadows on the old building contributing to the user experience. The threefold increase in space of the new concourse which creates an airy environment within the station, along with the necessary facilities that are provided, are important characteristics for the enjoyment of the spatial qualities of the building. This appreciation of the architecture thereby reinforces the correlation between man and built environment.

Figure 5.8: Shows the quality of the natural light casting interesting shadows in the space.
Source: https://blog.quintinlake.com/2012/08/11/kings-cross-station-western-concourse-by-john-mcaslan-partners/#comments [Accessed 26 June 2018].

Figure 5.9: The reglazed roof of the main train shed easing the transition between interior and exterior.
Source: https://www.designcurial.com/news/the-worlds-10-best-designed-train-stations-4332733/ [Accessed 26 June 2018].

However, the great effects of lighting are perpetual as the building comes alive in the evening with a smart approach to artificial lighting that highlights both the new design and the old building making Kings Cross Station a continuously vibrant space. The concept of the lighting scheme was to combine aesthetics and functionality, by producing a flow of light spread across the sophisticated white steel geodesic curvature of the new western concourse roof, to create a delightful effect. Furthermore, the lighting both complements and contrasts the modern and old surrounding buildings, with the original components of the 1852 Victorian listed building illuminated, drawing the eye and adding interest throughout the day and night (Fig.5.10) (Gourlay, 2018).

Figure 5.10: Artificial lighting creating an intriguing ambience.
Source: http://www.etnow.com/news/2012/8/a-c-special-projects-supplies-led-lighting-for-kings-cross-roof-structure [Accessed 26 June 2018].

Figure 5.11: The new redeveloped plaza displaying an enhanced public realm.
Source: http://luxreview.com/article/2015/04/king-s-cross-square [Accessed 26 June 2018].

The 7,000-square-meter new plaza known as the King's Cross Square located in front of the historic façade has been revitalised by the demolition of the ad hoc 1970s concourse as shown earlier in this precedent study, and now features trees, new outdoor furniture and lighting, a platform for artistic expression, and underground entrances linking to the London underground station. The pleasant and socially vibrant main entrance square is an invitation to the community of London as a whole, irrespective of race, colour or socio-economic standing. This creates a sense of 'belonging', where cultures are being invited to 'dwell' within the same environment where they are to be seen as equals (Coetzee,2012). The authentic nature of the shared concourses as opposed to superficial commercial space, accompanied by luminous naturally and artificially lit volumes with the articulation of structural innovation, provides an image that drives transport into the twenty-first century.

In terms of sustainable design, solar panels covering 2,500 square meters were installed on the roofs of the main train shed and a rainwater-recycling system has also been introduced. The revitalization of the station itself and neighbouring buildings has provided a catalyst for the redevelopment of the surrounding urban environment. The renewal of the station initiated the positive transformation of the railway yards into one of London's most progressive mixed-use developments (ULI, 2018). The urban development scheme around the Kings Cross precinct particularly the Kings Cross Station, indicates a sense of place making within the city of London. John McAslan (2013), the lead architect of the newly developed station supports this by stating that the development has been an extremely complex and cooperative process, subsequently leading to an enthralling piece of place-making for London (McAslan, 2013).

Figure 5.12: Shows the Kings Cross urban redevelopment scheme.
Source: http://www.mcaslan.co.uk/projects/king-s-cross-station-masterplan [Accessed 29 June 2018].

According to Lynch (1960, as cited in Coetzee,2012), all occupants of a city have had some sort of association with it that incites memory and perception, which whether positive or negative, will be withstood by the emotions felt within this space.

Kings Cross Railway Station in terms of public transportation has made progresses in all areas through its spatial and aesthetic transformation with efficient interchange established between the St Pancras London Underground, as well as with buses and taxis, therefore now making it renowned as being a major public transportation hub (McAslan, 2012). The merging of the restored grand old buildings with new modern facilities in compelling ways has proven successful at King's Cross Station. The revitalized King's Cross Station is now a much celebrated landmark due to the harmonious coexistence of the old and new features. The Kings Cross Station development is a perfect example of how great engineering combined with architectural inspiration provides a difference to the travelling public in enhancing their perception towards public transportation.

John McAslan and Partners (JMP) deliberates that the station together with the surrounding urban context could contribute to making London a 'European Gateway'. As stated by McAslan, "this incredible project has the potential to create and re-define civic identity and celebrate London" (McAslan, 2012)

5.3 THE TRANSPORT INTERCHANGE AS A TOOL FOR URBAN REVITALISATION: SOUTHERN CROSS STATION, AUSTRALIA

Southern Cross Station located in Melbourne, Australia was designed by Grimshaw Architects in response to the functional and logistical needs of the station, and to bridge the connection between the rejuvenated docklands and the centre of the city's commercial life (Raisbeck, 2007 as cited in Edwards, 2011). The original station was very utilitarian in its design requiring users to approach the station in very constrained tunnels and to come up in the middle of each island platform (Brewis, 2012).

Figure 5.13: Shows the poor accessibility of the old Spencer Street Station. Source:https://www.youtube.com/watch?v=7TgntOUKBVY. [Accessed: 4 July 2018].

Figure 5.14: Shows the utilitarian quality of the of the old Spencer Street Station. Source: https://www.youtube.com/watch?v=7TgntOUKBVY. [Accessed: 4 July 2018].

The site is situated on the borders of the currently emerging Docklands precinct and on the western side of the Melbourne city grid. From a historical perspective, the site shows the transition between Melbourne's well-ordered 19th century geometry, and a complex web of rail infrastructure including industrial warehouses. Apart from the topography, the site was perceived by the majority of urban dwellers, as part of a dangerous precinct. Before the regeneration of the docklands, the precinct was described as Melbourne's bad lands, neglected due to modernised shipping methods pushing the dock further south (Roke, 2007: 52). The urban approach for the scheme was to stitch together the two urban conditions through the facilitation of the stations 'publicness'. Hence, the expansion of both Bourke and Collins Streets would be incorporated into the public promenades of the city (Raisbeck, 2007). As a result, the newly developed station presents the heart of the cultural centre of Australia. From a transport perspective, the aim was to improve the railway experience and train visibility thereby creating some sort of belonging and usability for people within the city.

Additionally, a strong emphasis for the design of the Southern Cross Station was for it to be simplistic and understandable to the users encouraging a blend of occupants.
In terms of functionality, the design accommodates buses at street level and trains at a lower level. A total of sixteen tracks serving eight main platforms are angled according to the street, which allows the bus interchange to be tucked into the acute angle of the street which forms the perimeter of the station. The station occupies an entire city block comprising of concourses, platforms and booking halls. A bridge at high level permits the public to traverse across the tracks to shopping areas at the station perimeters. There are two main concourses that link Southern Cross Station with the city: the first links the main perimeter edge being that of the Collins and Spencer Street corner, to the stations booking hall and waiting area and lounges: the second concourse is a wedged shaped space that integrates the bus stop areas with the station area and comprises of a ticket area and double volume retail areas highlighted by the undulating roof.

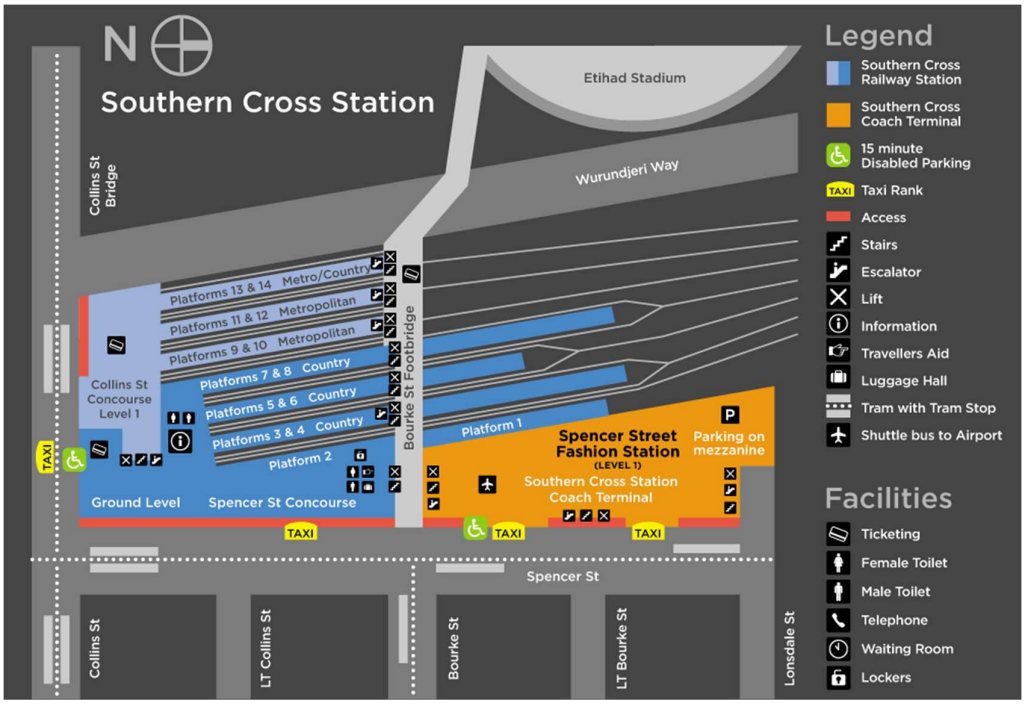

Figure 5.15: Shows the facilities and layout of the Southern Cross Station.
Source: https://www.melbournepoint.com.au/information/southern-cross-station/ [Accessed 4 July 2018].

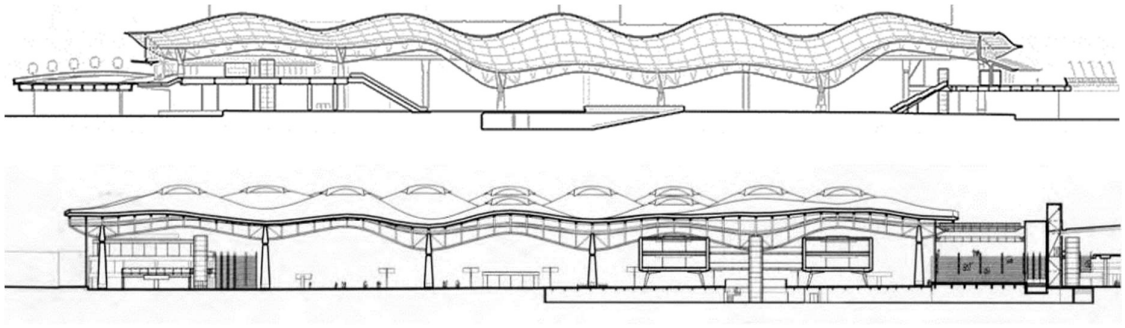

Figure 5.16: Cross sections of the Southern Cross Station through Collins Street and Spencer Street respectively.
Source: Rebecca Roke, 2007

The station's monumental scale is broken up by freestanding bright orange pods that house administrative functions and allow retail functions to be accommodated beneath (Grimshaw, 2018). The elevation of these pods allows for uninterrupted vistas in all directions which is one of main principals of the new station. Furthermore, the striking features of the pods by the use of colour provides a pleasant contrast from the monotony of steel, concrete and glass which allows for points of reference and markers within the vast station.

Figure 5.17: Shows the raised admiration pods on tapered steel legs.
Source:https://www.australiandesignreview.com/architecture/from-the-archives-southern-cross-station/ [Accessed 30 July 2018].

Figure 5.18: Shows the retail zones accommodated below the pods.
Source: https://grimshaw.global/projects/southern-cross-station/ [Accessed 30 July 2018].

Southern Cross Station is characterised by the use of natural light through skylights that corresponds with structural spine trusses running the length of the building allowing daylight to penetrate into the spaces. The extreme volumes of the station, and the predominantly transparent facades, allows for vistas in and out of the station to work effectively. The scale of the station complements the context of the city and emphasizes the richness of Spencer Street. Furthermore, the primary entrance on the corner of Spencer and Collins Street provides a smooth transition from the pedestrian footpath to the station's main concourse. The transparent glazing suspended above adds to the relationship between the city's street life and the interior of the station. Additionally, the glazing solves the issue of vandalism and safety that is evident around today's railway stations by eliminating dark and dingy spaces and removes any opportunity for illegal spray painting (Richards, 2012:88). Therefore, the perception of resilience that is associated with railway infrastructure that inhibits wear and tear from pedestrians, rail and vehicles, is maintained.

Figure 5.19: Shows the transparency of the station and relationship with the street edge.
Source: https://grimshaw.global/projects/southern-cross-station/ [Accessed 30 July 2018].

The main element of the station is the design of the roof as it facilitates both the experience of internal volumes as well as creates a landmark in the urban context. Grimshaw (2009) states that the natural daylight provided by transport architecture is essential for orientation as the structure should not go against the grain of movement. The roof of the Southern Cross Station in particular, comprises of three principals as put forward by Grimshaw: the first being that the roof is aesthetically pleasing when looking at it from above: secondly, the roof has the impression of floating above the platforms: and thirdly, the design of the roof depicts the major circulation zones from the functional zones. Keeping the focus on Southern Cross's elaborate form, the roof converges from four undulations into three as influenced by the shape of the city block. However, it expands at one side to accommodate the links made to bus services. These design principals contribute to the legibility of the complex interchange.

Figure 5.20: Shows the floating roof and skylights above the rail platforms and following the pattern of movement.
Source: https://grimshaw.global/projects/southern-cross-station/ [Accessed 30 July 2018].

In a deeper sense, the roof follows the line of the platforms rather than the perimeter roads, which indicates the importance attributed to the train over the car. In addition, the dune-like roof acts a visual bridge between the new docklands and the city centre and also unites the different elements of the transport interchange. Dr Peter Raisbeck, an architect and design tutor at the University of Melbourne describes the roof as "a carpet woven from a series of interlinked elements, an urban mat or palimpsest, which rewrites itself over Melbourne's grid" (Raisebeck, 2007). The roof not only captures one's imagination, but is designed to promote natural ventilation of hot air, exhaust gases and fumes by the use of elongated moguls or roof vaults which act as reservoirs. The airborne particulates move upwards and are dispelled through louvres at the peak of each mogul from where the force of existing winds create negative extraction pressure. These north-west and south-west winds define the valleys that cut across the roof form, ensuring natural ventilation all year round. The roof's form derivation shows the careful consideration afforded to the environment in respect to the hot external climate and prevailing winds thus creating a place appropriate response.

Figure 5.21: Shows the visual appeal of the stations prominent dune-like roof.
Source: https://grimshaw.global/projects/southern-cross-station/ [Accessed 30 July 2018].

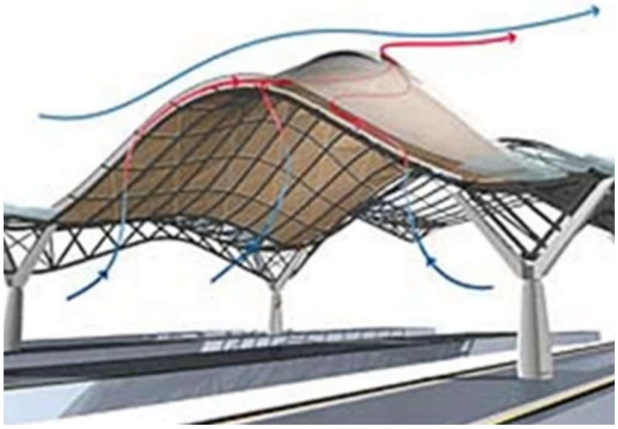

Figure 5.22: Diagram showing the peak of the roofs providing natural ventilation.
Source: http://www.zigersnead.com/current/blog/post/train-station-expels-fumes-passively-and-wins-lubetkin-prize/10-04-2007/122/ [Accessed 30 July 2018].

Further contributing to the buildings sustainable design, is the rainwater harvesting system estimated to conserve 20 million litres of water a year due to the vast roof area coverage of 34000 square metres (Grimshaw, 2008: 800). The collected rainwater is then stored in bladder-style tanks situated beneath the station and is thereafter utilised for cleaning purposes, and is subsequently used for vegetation in the area (Roke, 2007: 58).

The Southern Cross Station is an example of a transport interchange that is integrated well within the city fabric responding to the character, and the identity of a place. Edwards (2011) suggests that the design of public transport infrastructure can be inviting to all uses rather than just the travelling public and can benefit cross city movement. The priority in the Southern Cross Station is on the public and walkability rather than the transport system. This idea is demonstrated through the removal of the concept of front and back, allowing movement to occur in all directions, generating urban reorientation and encouraging economic growth.

The intention from the architect was to produce a public space representing nineteenth-century principals of public transport architecture. Although the historical aspect is not immediately apparent, the outcome depicts the capacity of a modern tectonic building that manages to achieve the perceptually enhancing principals of the past, through technologically advanced methods. Nonetheless, the building strives to restore the public nature of civic buildings while providing a level of comfort, convenience and delight appropriate to the city of Melbourne and its associated regional prominence. Thus, the Southern Cross Station is a good example of the relevance of modern architectural design in fostering civic spaces capable of uplifting the identity of the transport infrastructure towards sustainable urban environments

5.4 CONCLUSION

The two selected precedent studies have reinforced the ability of public transport architecture to enhance the perceptions of people. Although these studies do not cover all aspects of a transport interchange, both examples portray successful design approaches to building typologies of this nature. These studies offer a framework by which different aspects of public transport infrastructure have been designed, and represent built environments that illustrate how careful design can greatly enhance the urban environment. The international precedents investigated proves how successful transport facilities can become an important node, promoting opportunities for surrounding urban development while simultaneously making a statement within a city.

The study of Kings Cross Station in London illustrates the merging of old and new in an interesting way that contributes towards place making, encourages cultural convergence as well as sparking urban renewal. The Southern Cross Station in Australia uses imagery and iconism together with modernism, and shows the strong influence of the context in redefining an identity that people can respond to. Legibility and orientation are key design principals evident in both stations contributing to perception as a whole. Furthermore, the design of the functional components of the stations proves that efficient public transport infrastructure together with ease of access and safety is a necessity in challenging people's perception towards the use of public transportation.

Thus, the precedent studies demonstrate transport architectures innate ability to become markers in the landscape, while creating a positive identity for the public transport industry, and promoting a city's identity. In doing so, this inspires people from all socioeconomic standings to make use of the facilities presented to them.

CHAPTER 6: PUBLIC TRANSPORT ARCHITECTURE IN A LOCAL CONTEXT

6.1 INTRODUCTION

This chapter encompasses an empirical study of transport facilities in South Africa. The study was carried out in both Kwa-Zulu Natal and Gauteng to gain a broader insight into public transportation infrastructure in a local context. The case studies will investigate the strengths and weaknesses of existing public transport facilities in terms of the day to day functionality, and the relationship with people and the environment. It is noteworthy that the selected case studies have been analysed in contexts which differs to the proposed location and site for this dissertation. However, they have been analysed in an attempt to reinforce the principles best suited for a successful transport hub

The areas of interest within the study include the theoretical findings covered in the literature review section of this dissertation which displays the factors that impact on people's perceptions as well as providing an accurate depiction of the standard of South Africa's current transport infrastructure and possible areas of improvement and development. The studies have been investigated according to characteristics which include but are not limited to, location, general planning, spatial quality, movement, aesthetics and materiality, publicness, sustainability, symbolism, image and iconism, cultural consideration, and overall functionality. This is strengthened through the analysis of plans and images as well as first hand feedback from the users of the facilities, and the local authorities and municipalities.

6.2 BARAGWANATH TAXI RANK, SOWETO

The Baragwanath Transport Interchange and Traders' Market was selected as a case study for the research owing to it being one of the busiest transport nodes in South Africa, and would therefore offer insight into the dynamics of public transportation in a local context especially with respect to informal trade. Soweto is one of the largest townships in South Africa, abundant in history and public interest, leading to this transport hub acquiring much exposure nationwide. Previously, opportunities for employment were prohibited in Soweto, hence the interchange services a large part of Soweto's residents in getting to work in other parts of the city, and returning home. Approximately 70 percent of Soweto transport users make use of the interchange, and the vibrant public space is an attraction for a substantial amount of Soweto occupants.

The development stretches over a length of 1300 metres along Old Potchefstroom Road which is the primary route into Soweto, with a site width of only 50 metres. This facilitated the implementation of a spine like concept along the entire length of the northern part of the site in the form of an arcade from where the necessary functions and logistical facilities such as storage, management and support infrastructure, are connected.

Figure 6.1: Birds eye view of the Baragwanath Transport Interchange.
Source: Hansen, 2010

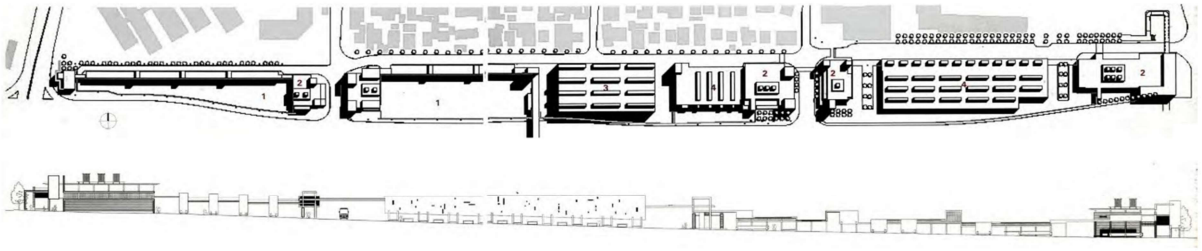

Figure 6.2: Site plan and elevation of the Baragwanath Transport Interchange.
Source: Hansen, 2010

In essence, commuters traverse along the arcade, while transferring from one transport station and public space to another. Thus, the Baragwanath Transport Interchange is in accordance with the statement that architecture stimulates movement that could be real or imagined (Bloomer & Moore,1977: 59). Such movement can be achieved through the structure, landmarks or focal points as well as colour or texture to create a sense of continuity.

Figure 6.3: Shows the linear arcade beside the transport services.
Source: Author, 2018

Figure 6.4: Shows the use of colour to create continuity and movement.
Source: Author, 2018

Additionally, the buildings interface from the arcade to the terminals is simple as a result of the terminals being on one side and the arcade being on the other allowing commuters not to deter from their movement path. Moreover, the narrow width of the site and the length of the buildings orientation provides enjoyable sunlight for the commuters especially in winter. The double volume arcade links to all six terminals with spaces to pause in-between, facilitated by market squares which contain ablutions, self-storing stalls and benches, inviting travellers to a relaxing space. Each market square can be independently sealed off thereby enhancing safety and surveillance through controlled patrols. The trading halls at the interchange further have visual links to one another creating networks between all of the traders in the area which in turn caters for extensive and flexible facilities for the users, while moderating congestions in the arcade.

Regarding the urban surroundings, the transport facility lacks a destination point at either end of the linear footprint. However, adjacent to the facility, a link exists with the Baragwanath Hospital, and a relationship has formed with the residential component on the opposite side, which now functions as commercial outlets feeding off from the activity initiated by the Baragwanath Interchange.

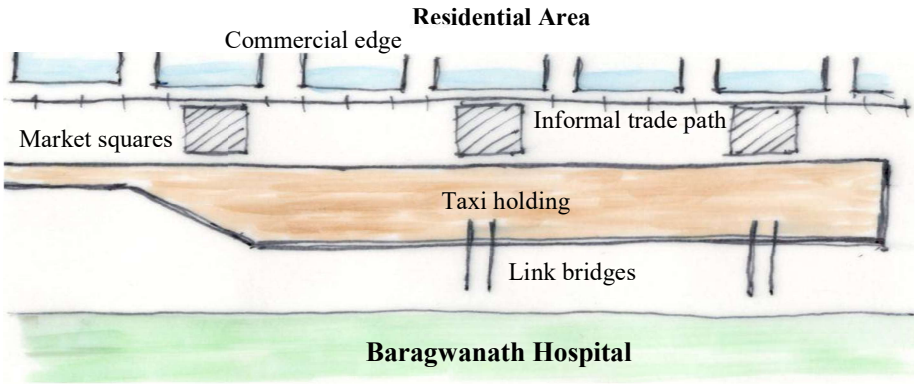

Figure 6.5: Zoning sketch of the Baragwanath Transport Interchange.
Source: Author, 2018

The facility accommodates 500 street traders along with associated services, deduced after careful investigation of the day to day operations of street trade through workshops and negotiations involving taxi associations, bus companies, city officials and informal traders (Deckler et al 2006:65). Spaces for informal trade are designed while considering varying degrees of control. This is evident in the different sizes of stalls which accommodate different types of businesses, and the facilitation of less frequent occasional traders in expressed niches along the linear path.

Figure 6.6: Trader stalls incorporated in niches along the movement path.
Source: Author, 2018

Figure 6.7: An interior market square showing natural light, trade and artwork adorning the building.
Source: Author, 2018

Additionally, the support structures along the spine accommodate cooking facilities and other destination stalls (Hansen 2016, as cited in Chokupermall, 2016). The concrete colonnade of the building is lined with seating that serve a dual purpose of also being utilised as trading stalls.
The significance of art in public transportation architecture in a global context has been highlighted previously in this dissertation. In the same way, the Baragwanath Transport Interchange features the incorporation of artworks and mosaics done by locals, expressed in the landmark structures which act as a canvas and focal points to the building. Such a landmark can be seen at the public entrance

of the spine allowing a sense of orientation while simultaneously contributing to a sense of ownership and identity through the local artwork. However, people seem not to derive any meaning from the artwork, therefore it is essential that the choice of art is relatable to the majority of users and is representative of the community.

Figure 6.8: Shows the expressed landmark structures allowing for orientation.
Source: Author, 2018

In terms of materiality, majority of building materials used in urban revitalisation projects in South Africa and in the Baragwanath Transport Interchange in particular are focused towards durability and robustness which include off shutter concrete and brickwork. Apart from its characteristics such as low maintenance, cost effectiveness and fire resistance, the use of brickwork is suitable especially in South Africa's climate, increasing the thermal mass of the building and resisting moist weather conditions. Moreover, the use of brick can convey the meaning of permanence and solidity aimed at acknowledging the importance of public transport infrastructure for the community. The language of the Baragwanath Transport Interchanges architecture disregarded the conventional lightweight steel construction associated with transport typologies, by opting for an expressive concrete structure that reflects the experience of mass commuting in a dense urban fabric.

Furthermore, concrete has the potential of being aesthetically appealing besides being utilised solely as a construction material. Off-shutter concrete has the advantage of flexibility and choice in its use as a finish, for instance, a smooth, textured or natural surface, depending on the desired outcome, thus also presenting an economical choice of building material. These building material properties

established by the use of brick and concrete are essential in transport interchanges with its associated complexity in terms of logistics, density of commuters, movement and traders.
It is of significance that the building materials in the development were architecturally expressed in a sophisticated fashion to avoid a monotonous experience. This was achieved by a mix of carefully proportioned orthogonal voids in the concrete structure contrasted with solid walls, suspended platforms and cantilevered seating lending a sculptural appeal. The inclusion of mosaic tiles and the patterns created on floor surface by the pavers, imparts a more vibrant atmosphere to the transport node. However, waterproofing for the concrete roof structure was always going to be a challenge in construction.

Figure 6.9: Shows the robust quality of the buildings materials and the architectural hierarchy.
Source: Author, 2018

Figure 6.10: Shows the aesthetic and sculptural appeal of the buildings materials.
Source: Author, 2018

Overall, the project forms an appropriate precedent with regards to its logical approach and its relationship with the context such as the arcade development responding to the practical needs of the traders while also contributing to an aesthetically pleasing environment, resulting in a sense of place. The sculptural ‘spine’ forms a focal point in the landscape whilst forming a legible structure to the market in which the public can easily be orientated.

6.3 MOSES MABHIDA STATION, DURBAN

The Moses Mabhida Station in Durban is appropriate as a case study as it expresses South Africa's emerging aspirations of creating prestigious public transport architecture and being part of a contemporary era. Completed in 2010, the station was designed to serve as a transport node for the FIFA World Cup. Hence, the station is located adjacent to the iconic Moses Mabhida Stadium as referred to earlier in this dissertation, and serves as a precedent for a distinctively African station and a welcome addition to South Africa's neglected rail network through the celebration of local culture. The design was appointed by Metrorail and the Passenger Rail Agency of South Africa to Arup Interchange Design with the aim of creating a contemporary space that encompasses a transport node which contributes to urban and social rejuvenation thereby suturing the public realm. The design team chosen are known for their expertise in transportation typologies globally.

The Moses Mabhida Station is situated on pivotal commuter activity and provides a vital link with the Umgeni rail corridor, especially the Kings Park Sporting Precinct. The station provides a connection between Isaiah Ntshangase road bridge which forms the main street entrance, and the rail tracks below. This is achieved by the building being supported on stilts which correspond to the level of the bridge, allowing commuters to filter across the tracks and down to the platforms. The street housing the entrance of the station is bordered by Masabalala Yengwa Avenue on the east and Umgeni Road on the west, which are the two main roads facilitating public transport access. Thus, there is a lack of public transport drop off and pick up points in close proximity to the station which proves to be a major issue of the underutilised transport node.

Figure 6.11: Illustrating the main entrance of the station from Isaiah Ntshangase road.
Source: Author, 2018

Figure 6.12: Illustrating the building supported on stilts with the platforms below.
Source: Author, 2018

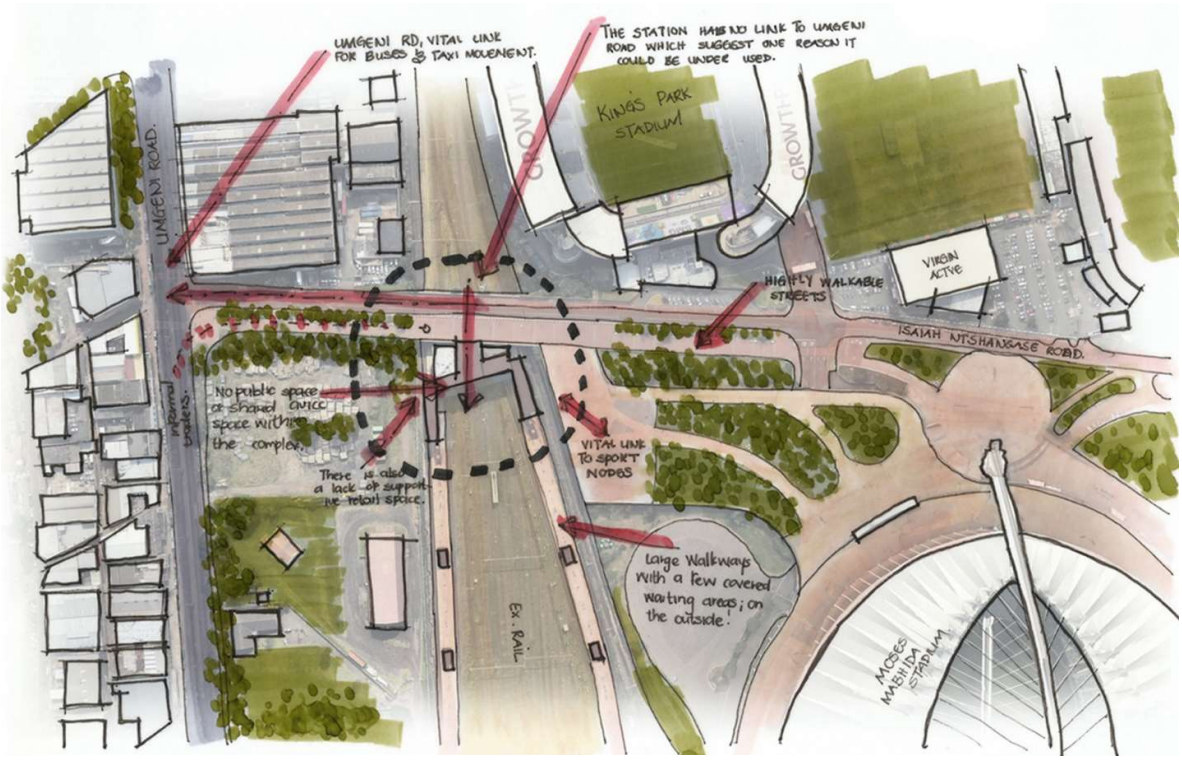

Figure 6.13: Illustrating sketch overlay – analysis of existing Moses Mabhida Train station.
Source: http://www.earth.google.com [Accessed 10 September 2018], edited by author, 2018

In terms of the design principles, Arup states that, “The design ambition for the Moses Mabhida Station was to integrate architectural vision, civic identity and urban context within the rigorous requirements of passenger flows and operational demands.” Therefore, the designers of the station gave prominence to legibility such as easy accessibility, visibility and movement, in an attempt to dignify public transport. The spatial volumes that followed were ones that corresponded with mobility, movement and interchange. Furthermore, light was another key factor together with the absence of clutter in providing a clean and comfortable experience. Additionally, the language of the station was another challenge facing the design team due to the presence of the stadium which forms a landmark in Durban. However, the team desired for the station to have a character of its own through contemporary expressive architecture rooted in the culture of KwaZulu-Natal. This was done through the combination of different cultural and place elements from Durban, for instance, through crafts and traditional features such as woven baskets and their colourful elements, and the harbour or industrial port context, with the rusty steel containers, ships and the sea, as impetus for the design of the station. As a result, the language of the station that developed is expressed through the woven nature of the different architectural forms, along with the materials used in the design, to form the overall composition of the station.

Figure 6.14: Shows the use of traditional features in the design of the station.
Source: Author, 2018

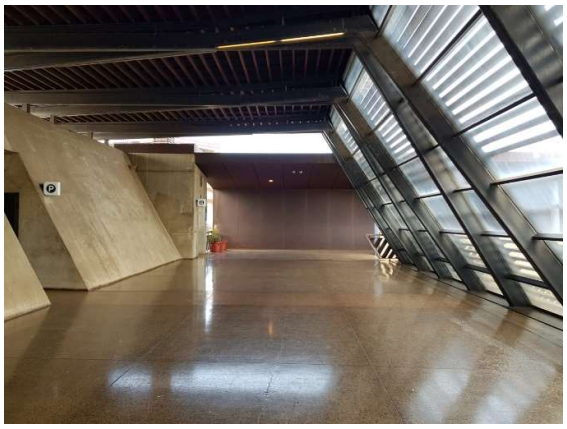

Figure 6.15: Shows the large volume, naturally lit concourse with the absence of clutter.
Source: Author, 2018

The station is composed of layers making it user friendly and prominent in the urban landscape. The freestanding quality of the station makes it unique to its surroundings which makes it appear as though a ship is moored to its surroundings only by the pedestrian bridge. According to Arup, the idea is to create the illusion of interchanging from land to ship when walking into the station, emphasizing reference to the harbour. The Moses Mabhida Station comprises of two levels, the first level includes the entrance from the bridge, and reception facilities such as tellers for ticketing, and information areas. The main hall concourse is also situated on this level which encompasses security and staff facilities hidden away from passengers. From the high level concourse, passengers then descend to the lower level platforms by means of lifts or staircases. The scale of the building for pedestrians is tapered by the bridge over the rails separating the station from the immediate pathways.

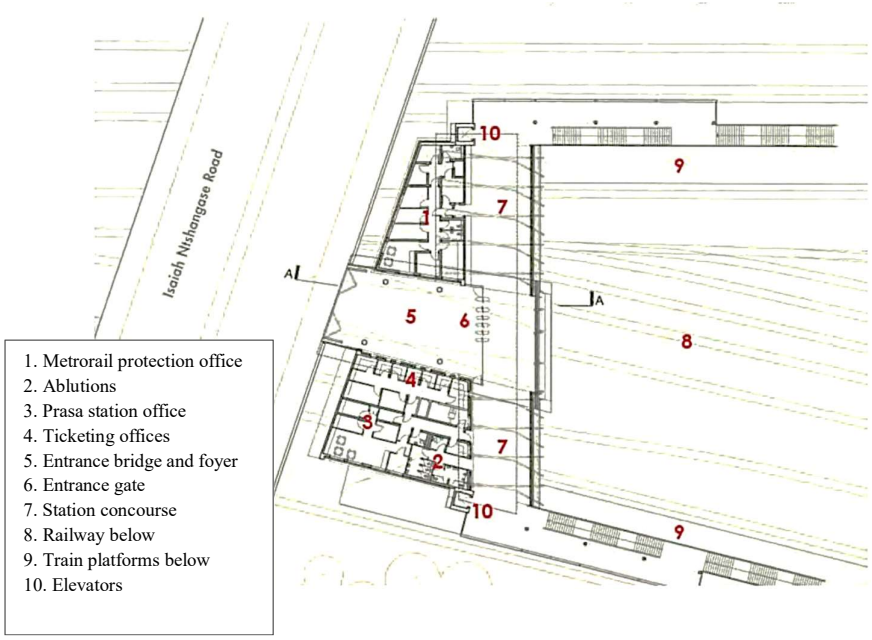

Figure 6.16: illustrating the plan of the upper ground level of the station.
Source: Peters, 2010 edited by author, 2018

The structure itself is sheltered by a main high canopy and two secondary canopies. The layered structure of the station was informed by the angled platforms on both sides of the railway tracks. Similar to a woven basket that forms part of the core of KwaZulu-Natal's craft culture, the platform floors spatial lines translate above onto the canopy which is repeated throughout the structure forming a woven pattern that folds around the ceiling of the concourse as passenger's progress through the station. Moreover, the geometry conceptualised by the idea of weaving, is also demonstrated through the pattern of lighting in the station. This results in bold geometry of shifting planes, a further reference to the industrial port context. Another feature of the station are the open windows which offer views of the neighbouring stadium while allowing daylight to create dynamic patterns of woven shadows on the floor during the day. At night, the transparency of the station is noticeable, with artificial lighting streaming through the timber slats converting the station into a radiant beacon in the landscape.

Figure 6.17: Shows the woven pattern of lighting creating an intriguing ambience.
Source: https://www.leadingarchitecture.co.za/design-with-dignity/ [Accessed 31 July 2018].

Figure 6.18: Illustrates the station as a beacon in the landscape.
Source: https://www.leadingarchitecture.co.za/design-with-dignity/ [Accessed 31 July 2018].

It is a subtle station, with an inviting canopy that leads into a timber cladded space with polished floors and glazed railings. The use of timber is used to a large extent in the building, balancing the robustness of the designs operational requirements, by enhancing its form and providing a natural warmth and a rhythmic texture to the building. The tellers are framed by timber, arousing a homely feeling while maintaining the official quality of the station. The base of the station is concrete while the outer skin is constructed of self-weathering steel. The result is a blend of natural timber that can be seen as woven into the urban materials of concrete and steel. The combination of concrete and steel together with toughened safety laminated glass, offers protection to the public from the live railway wires as well as intruders. The simple material textures employed in the building relates to the cultural language and architectural principles while maintaining its durability. Furthermore, the

sophisticated pattern of materials avoids disorderly detailing found in electronic signage, displays and seating which generally clutter the building. Instead, the seating, made of concrete, surfaces from the concrete platforms and signage is built into the walls thereby indicating the integration of detailing into design.

Figure 6.19: Shows the concrete seating emerging from the ground.
Source: Author, 2018

Figure 6.20: Shows signage integrated into the design to minimise clutter.
Source: Author, 2018

The design of the Moses Mabhida Station sets a new standard for public transport architecture in South Africa by introducing principles of international best practice. This results in a contemporary space for Durban's unique urban environment while embedding the building firmly within the local culture and context showing hybridity. The architecture reveals an understanding of volumes, materiality, urban linkages, movement of commuters and appropriate use of both natural and artificial lighting. The stations design is considerate of the surrounding context and the impact of infrastructure in filtering transport into the neighbouring communities. Hence, the station displays the liberating role of public transport in encouraging urban regeneration in South Africa by the use of architecture as a tool to express this change.

6.4 CONCLUSION

The abovementioned case studies provide valuable insight into public transport architecture and its development in a local context from two different approaches. The Baragwanath Transport Interchange displays the successful inclusion of the community during development stages and daily operations of the building. The facility is commendable for its high level of consideration given towards informal trade, as it plays a major role in the sustainable functionality of the interchange. The numerous levels of social cognizance prove the ability of transport facilities to generate the development of potential commercial opportunities around them, as identified in the positive transformation taking place in the surrounding environment of the station. Overall, the Baragwanath Transport Interchange is a great example of architecture that meets the needs of the existing South African public transport system. However, the facility lacks in encouraging a shift towards a modern system of international standards, and its appeal to a broader demographic selection.

The Moses Mabhida Station instead, represents South Africa's efforts to reintroduce the impressive qualities of public transport architecture from around the world and the facilities that are associated with them. The station provides a heightened perception and a memorable experience through architecture thereby challenging the stigma people have of unsafe and rundown public transport facilities. Ultimately, both transport facilities display the thorough consideration of culture and context and are designed to maximise user orientation and legibility and most importantly comfort.

CHAPTER 7: ANALYSIS AND DISCUSSION

7.1 INTRODUCTION

The purpose of this chapter is to present the ideas discovered through the investigative approach conducted in attempts to satisfy the key questions that formulate the argument and further understand the influence of perceptions of the public towards transportation especially rail commuting in South Africa. As such, this chapter aims to highlight key findings from empirical data that was gathered from case studies in a local context, including questionnaires and interviews aimed at transport users. In addition, the study also focused on commuters and business owners within the vicinity of the Pietermaritzburg Railway Station, employees of the station, and the general public. The participants were selected based on criteria such as nationality, ethnicity, and age group to allow a multi-layered cultural configuration of research findings to gain a holistic view of their perceptions towards public transport.

7.2 SUMMARY OF FINDINGS

7.2.1 Analysis of Interviews

The data gathered from engaging directly with commuters at public transport facilities offer valuable insight regarding their perceptions of both public transport and the facilities itself. The common thread was that people preferred to use a particular form of public transport such as the mini-bus taxi because of accessibility, efficiency and affordability. However, the public did display concerns for the roadworthiness of buses especially mini bus taxis, and the driver's disregard for the rules of the road. Nevertheless, commuters made use of the transport mode purely for mobility and a lack of choice of any other means beneficial to them. The negative perceptions that interviewees generally had concerning other public transport modes stemmed from the higher tariffs involved or the lack of accessibility. On the subject of the transport facilities, the majority of commuters and staff criticised it as they felt it did not respond to their needs in terms of comfort and amenities.

The data collected from the non-users of public transport reflected concerns for safety and crime at the core. Furthermore, the public transport facilities were described as unclean, and uninviting to the general public. Overall, the public expressed a collective dissatisfaction with the current public transport industry in South Africa in comparison to other countries all around the world.

7.2.2 Response to Questionnaire

The purpose of the questionnaire was to obtain a diverse and justified response from the public regarding their feelings towards public transportation infrastructure, and a platform for them to suggest what possible improvements could be made. The participants included commuters that use public transport on a regular basis, non-users of public transport, as well as people that use both forms of mobility namely that of public transport and private automobiles.

From the varied responses, it was revealed that the mini-bus taxis are the most frequently used mode of public transport but also rated the poorest with regards to comfort and quality followed by the bus. The train however, was rated as good in terms of safety and quality but was criticized for its efficiency with respect to travel time. In addressing the heritage component, the responses were quite diverse whereby a fraction of the public recognise the beauty of old historic public buildings in particular the Pietermaritzburg Railway Station, and would like to see them preserved and restored, while some called for them to be demolished as it was a symbol of the past. A large number of the public recommended that a new train station be built to accommodate the current and future generations thereby also revitalising the precinct by creating social and economic opportunities. In addition, many users felt that a new train station would facilitate new rail infrastructure as a whole which may lead to increased rail travel.

A sample of a typical questionnaire used to gather the primary data for the dissertation can be found in Appendix B while a summary of the responses from participants can be found in Appendix C.

7.2.3 Key Findings

Based on the primary data collected from engaging directly with participants, it is evident that people's perceptions have a definite influence on built form. Hence, it is vital that practitioners understand society's role in fostering a progressive urban realm.

Generally, the public conveyed a major concern for safety and crime in the current public transport industry both with regards to the relevant mode of transport as well as the stations. This is noteworthy as it is found that a safe built environment is frequented by the public more often which prevents the building from becoming dormant and underutilised. Furthermore, most people faulted the cost and unreliability associated with public transport. The choice of a particular type of public transport as a means of mobility was solely dependent on the quality of the transport mode

including accessibility, efficiency and affordability, rather than personal preference. Although, it is significant that commuters were willing to pay extra tariffs for a more efficient system.

According to the responses from practitioners of the built environment and experienced academics, transport facilities in today's age still lack some key planning elements. In the case of the Moses Mabhida Station, users complained about its superficial nature due to the lack of retail or informal trade as well as insufficient ablutions. The negative feedback from the Moses Mabhida Station has also shown the importance of having supporting transport modes in close proximity to create a vibrant and efficient environment. This suggests that more careful consideration of the functionality of these stations need to be focused on from a user perspective. In addition, the effects of combining transportation and trade as seen in the Baragwanath Transport Interchange have influenced the frequent use of the station as people feel the station is now a more effective, and convenient facility.

7.3 CONCLUSION

The empirical research done for this study has served to substantiate the research problems and justify the need for improvement in the public transportation industry. It has been discovered that although efforts have been made to improve the current public transport sector in South Africa, demographics and the effects of Apartheid still play a major role in influencing the current perceptions of public transportation as well as a lack of holistic urban approaches. However, the data gathered from the research findings can be used as a tool for the implementation of possible solutions offered by the public.

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CHAPTER 8: CONCLUSION (AND RECOMMENDATIONS)

The aim of this chapter is to reach a conclusion based on the primary and secondary data gathered throughout the research to offer a viable recommendation as to how perceptions on public transportation infrastructure can be improved to allow its sustained use by all South Africans, regardless of an individual's background or demographic.

The primary question of the dissertation aimed to respond to the research topic, relating to the influence perception has on architecture. The theory of Perception provided a starting point and a platform for other connecting theories to discover an answer to this question. The key questions supported the process of testing the hypothesis leading to issues of interpretation, identity and place. These were significant as they provided for a general understanding of the idea of meaning. It was realised that one would have to grasp a variety of social issues involved with urban civic space to gain a true representation of the impact of perceptions.

Through the research findings, it is evident that public transport infrastructure has the ability to have an impact on society, depending on numerous variables. Architecture, through an abstract approach can aid the process of challenging the mind-set of society through symbolism that relates to the place and social identity making people attached emotionally with the built environment. The meaningful relationship between mankind and the environment physically and mentally influences one's perception towards a building to a certain extent. The research also sought to investigate the concept of architecture as a tool in the identification or formation of identity, in attempts to redefine the identity of South Africa's public transport industry. This study must now return to the primary question, which inquires how can perceptions influence public transport infrastructure? The nature of the phenomenon of perception suggests that the context of the study is necessary for creating meaningful architecture as opposed to a universally applicable solution. Thus, this dissertation provides a framework that allows for an accurate understanding of the existential aspects of place to be developed.

Public realms have the ability of radiating energy to its surroundings and also being an attraction in itself which plays a part in contributing to a city's identity. A public transport hub, as shown in the research is an example of such a building which can act as a landmark in the city while representing a democratic society. The success of a building is determined by its positive contribution to the public realm which is assessed by the relationship of people and the built environment. The notions of a buildings image and urban landmarks were acknowledged in chapter 4.4 of this study. This

identity is also expressed through means of integrating local community based artworks, contextual landscaping and possibly the integration of iconism. The image and iconic features of a building allows commuters to have a sense of arrival at a transport node as well as identify with the building.

Iconic architecture as an instrument for social identity has also been part of the research. Consequently, icons have the power to be used for economic status, represent and empower communities, and act as instruments to assist in the development of cities and nations. As such, icons are beacons of identity due their physical presence and the meaning they provide to the environment. In essence, iconism can be used for the greater good of society by way of community development through job creation, the stimulation of economic growth through business opportunity, and urban revitalisation. Furthermore, design principles of rhythm, proportion, hierarchy, balance and scale that constitute an icon need to be considered to create buildings that stand out in the landscape. This can be done through dynamic sculptural forms, materiality, and sophisticated building technology to give character to the design as well as to gain international recognition. By using distinct materials and methods, new buildings can transpose perceptions and reflect a city or nations ambition to embrace the future through its form and associated meanings. The building should attract the public from the distance by means of urban design principles as shown by Kevin Lynch in the 'Image of the city' that configures the surrounding environment in order to make the link possible. Additionally, the representational elements in the form of signs and symbols that give meaning to a building together with individuals and communities, is essential in order for people to connect with the building, and ultimately create 'place'. Overall, the attributes of an icon will allow Pietermaritzburg, the location of the study and the capital of its province, to re-establish its image and become a true symbol of the people and city of choice.

In terms of genius loci, with reference to identity, civic architecture and its capability to represent national identity was investigated along the lines of Lawrence Vale. It was realized that people perceive things differently depending on their culture and other variables. Therefore, the perception of designing a building that represents a nation could lead to the misapplication or denunciation of a building. Thus, a building should be abstracted in its nature, however a fine line has to be drawn in order for the building to avoid becoming culturally neutral. Consistent with Norberg-Schulz, the absence of environmental considerations has also resulted in buildings that are basically meaningless. In response, South African public buildings such as a transport hub would have to respond to local environmental factors such as climate; relate to social needs and values and employ sustainable construction methods through efficient use of local labour resources while simultaneously endeavouring for excellency. Furthermore, the building technologies and

construction methods and technologies must create a link between the inside and outside through lightweight structures and transparency to allow inhabitants to appreciate their surroundings.

Through the research, it has also been found that a vibrant space necessitates an emphasis on the experiential quality of an environment. It focuses on more than just the visual sense but rather all of the senses as outlined by Pallasmaa, which seeks for a deeper meaning in which the public can engage with their surroundings. A multisensory experience can be heightened through the buildings form itself and its function. In this way, a comfortable environment and a sense of belonging may be developed. Sensory architecture, one that enhanced perceptions was evident in the earlier eras prior to modern era particularly in public transport architecture such as railway stations. Although this dissertation does not motivate for the design of buildings to return back to the methods of the past, the valuable principles from earlier times need to be revisited and efforts should be made to interpret those principles in a modern way and applied in our present day architecture. As a result, a hybrid architecture can exist in an era that combines the fundamentals of perception with contemporary architecture.

From the precedent and case studies, it appears that city officials and private investors have not accounted adequately for all socio economic groups during regeneration developments as in the case of Moses Mabhida Train Station and the Baragwanath Transport Interchange. Due to rapid urbanisation and technological advancements, government should look at employing Transit Oriented Development and Compact city approaches as a suitable approach to urban development. The introduction of western ideas in the developments would also assist in appealing to the broader public and encourage economic growth. Therefore, it is vital to understand that cities, besides being fundamental to financial gain also act as the centre of multi-cultural social diversity. The success of cities is largely dependent on their institutional and economic competitiveness but also the level of social equality.

In terms of the design of the building itself, it is recommended that the transport typology be of mixed uses including economic functions to ensure the day to day running of the facility, and attracts tourists by acting as a gateway to the city. The introduction of social components into the development through public squares, retail, restaurants, and housing in close proximity would inspire the public to engage with public transport. Furthermore, creating spaces that allow positive frictions to occur between cultures and catering for subcultures would lead to a ‘place’ that is diverse and rich in cultural configurations hence promoting social interaction. Regarding sustainable design, consideration should be made to strategies such as natural ventilation, passive

daylighting and rainwater harvesting to also encourage a meaningful relationship with the natural environment. An iconic feature in the form of a particular element or the building as a whole, will create a distinct identity for the facility. Therefore, the building, by becoming a destination node, should be located in an urban environment to allow it to act as catalyst for city regeneration. Furthermore, the building should also have functions that correlate with the fabric of the city. Through this, the building will create meaningful architecture by representing the people and the city of Pietermaritzburg itself. Finally, the informal sector in South Africa remains vital for the livelihood of a large number of the public as demonstrated in the Baragwanath Transport Interchange. It is also the platform where creativity is explored and entrepreneurship encouraged. Thus, sustainable transport facilities need to relate to the African context by becoming transition zones between the informal and formal industry in order to express the 'Ubuntu' of South Africa.

To conclude, it is clear that perception is linked with the varied experiential narrative of each person affecting how they perceive the built environment. Architecture has a key role in changing the image of public transport infrastructure in South Africa, by producing environments that allows the function of the building to thrive, while ensuring that the architecture is appealing to the public. Transport hubs are places that have the ability to bring societies together, as a result of their varied commuter integration. Therefore, it is essential that public transportation, particularly rail commuting be re-established through government assistance whereby adequate funds must be allocated to improving safety, technology and affordability. Transport facilities as a whole, must be void of any segregation and should promote social equality. As discussed in the study, linkages, movement paths, natural lighting, legibility and orientation, are amongst the main design principles to be applied in the establishment of improved station environments.

The design of the proposed transport interchange in Pietermaritzburg, is an attempt to combine locally appropriate techniques with international design standards, as a symbol of a new approach in railway station design for South Africa. An efficient movement system between and within cities will help in facilitating the needs of a city's inhabitants, as well as improving the country's image as a tourist destination on a global scale thus enriching peoples experience of South Africa. It is recommended that the execution of the proposed transport interchange in Pietermaritzburg follow the guidelines outlined in this document to ensure that meaningful architecture is achieved.

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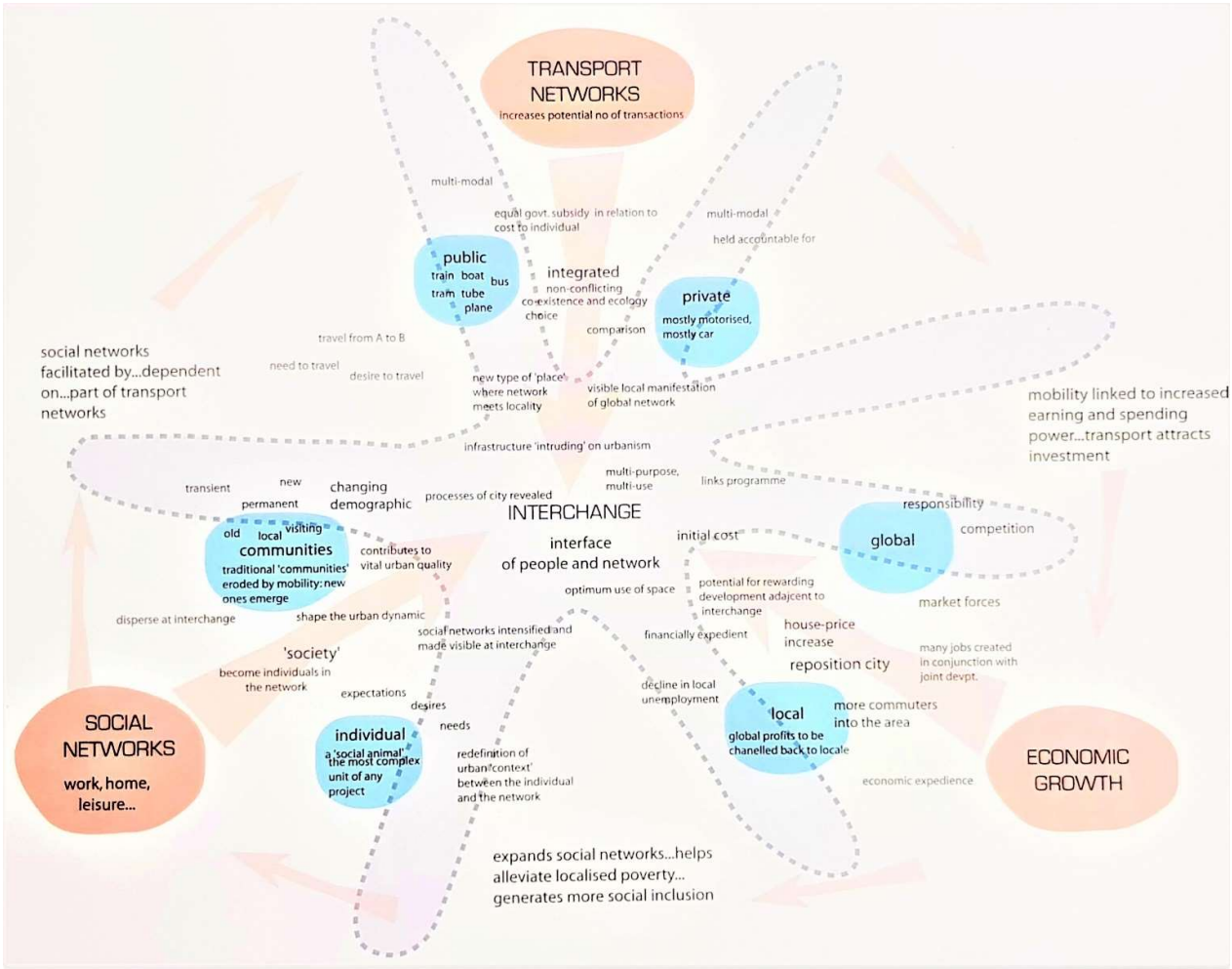
APPENDICES

Appendix A – Model of an effective transport hub and its various spheres of influence.

Image courtesy of Fiona Scott (as cited in Edwards, 2011)



Appendix B – Sample of typical Questionnaire

The following questionnaire will be used to collect information from various sources from the Pietermaritzburg Railway Station Precinct including the rail transport staff and management, shopkeepers and informal traders in the vicinity of the station, commuters and the Pietermaritzburg citizens.

Please note that the questionnaire is for academic purposes only and your information will be strictly confidential as per the consent agreement.

1. Nationality

_____

2. Ethnicity

Black □ White □ Coloured □ Indian □ Other □ (Please specify) _____

3. Age

_____

4. Do you own a private motor vehicle?

Yes □ No □

5. Do you use public transportation?

Yes □ No □

6. Which is your preferred mode of public transport?

_____

7. Is there a safety concern with regards to the public transport facility?

_____

8. How frequently do you make use of public transport?

_____

9. In South Africa, which transport system functions efficiently?

_____

10. In terms of infrastructure, can the current public transport facilities be improved?

Yes □ No □

11. If you answered yes to question number 10, please explain how can it be improved?

_____

_____

12.How would you rate each specific form of public transport in terms of safety:

i) Train: Poor □ Average□ Good □ Brilliant □

ii) Bus: Poor □ Average□ Good □ Brilliant □

iii) Minibus: Poor □ Average□ Good □ Brilliant □

iv) Meter Taxi: Poor □ Average□ Good □ Brilliant □

13.How would you rate each specific form of public transport in terms of quality:

i) Train: Poor □ Average□ Good □ Brilliant □

ii) Bus: Poor □ Average□ Good □ Brilliant □

iii) Minibus: Poor □ Average□ Good □ Brilliant □

iv) Meter Taxi: Poor □ Average□ Good □ Brilliant □

Only if answered 'No' in Question number 5 please fill in below

14. Why don't you use public transportation?

_____

_____

15. What do you think the government should do with old public/ heritage buildings in South Africa?

□ Restore them and adaptively re-use them.

□ Demolish them and build something that appeals to our generation.

□Leave them as symbol of the past.

□I don't care

If there was a new transport hub built in Pietermaritzburg, would you use it & why?

Yes □ No □

_____

_____

Appendix C – Summary of Questionnaire Responses

	Questions	Candidate Interviewees							
		Abdul Hanif	Tracy Gray	Mlungisi Zwezwe	Matome Shabangu	Zakhirah Dhoda	Nithen Singh	Shane Spiers	Sifiso Ngamu
1.	Nationality	South African	South African	South African	South African	South African	South African	South African	South African
2.	Ethnicity	Indian	White	African	African	Indian	Indian	White	Black
3.	Age	27	32	34	65	45	16	18	32
4.	Do you own a private motor vehicle?	Yes	Yes	No	No	Yes	No	No	Yes
5.	Do you use public transportation?	No	No	Yes	Yes	No	Yes	Yes	Yes
6.	Which is your preferred mode of public transport?	Bus	Train	Mini-bus taxi	Taxi	Bus	Mini-bus taxi	Train	Mini-bus taxi
7.	Is there a safety concern with regards to the public transport facility?	Yes	No	No	Yes	Yes	Yes	No	Yes
8.	How frequently do you make use of public transport?	Never	Rarely	Occasionally	Monthly	Exceptionally	Weekly	Weekly	Quite often
9.	In South Africa, which transport system functions efficiently?	None	Bus but costly	Taxi mostly	Rail and Taxi	Rail	Rail	Rail but it can be improved	Taxis
10.	In terms of infrastructure, can the current public transport facilities be improved?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	If yes, how?	More efficient road networks connecting residential to business hubs	Improved comfort, speed and efficiency for commuters	It can be made more comfortable for commuters.	Drop-off and pick-up locations for passengers must be made safer with crime increasing	It can be modernised and upgraded	Must be more reliable with improved quality	Yes, the time to cover longer distances can be lessened	Improved safety
12.	Rating of public transport in terms of safety	Poor	Average	Average	Poor	Poor	Poor	Average	Poor
13.	Rating of public transport in terms of quality	Poor	Poor	Average	Average	Average	Average	Poor	Poor
14.	Why don't you use public transportation?	Unsafe and unreliable	Pick-up points too dangerous	n/a	n/a	Unappealing and unsuitable	n/a	n/a	n/a
15.	What should government do with old public/ heritage buildings in SA?	Buildings need to be preserved so future generations can track progression since Apartheid	Reintroduce and reincorporate the buildings by development	Old buildings have history so it's important to preserve and improve them	They should preserve them so we can educate our kids on the history of South Africa	Preserve and restore all buildings	Remove the old and replace with a new building	I would like to see the Station revamped to match the likes of Gautrain Station	Destroy them - it is just a symbol of the oppressive past
16.	If there was a new transport hub built in Pietermaritzburg, would you use it & why?	Yes, public transport would be more cost effective if implemented successfully	Yes, if it was safe and convenient	Yes, one like this does not exist in Pietermaritzburg	Yes, if the location was easily accessible	Yes, if it catered to different classes of individuals	Yes,	Yes, if it was cleaner and safe	Yes, it could provide new opportunities for economic growth for the city

Questions		Candidate Interviewees							
		Precious Xaba	Thando Sithole	Gabriel Govender	Martin Graham	Zama Chiya	Fana Mbaso	Clara Strydom	Gale Harry
1.	Nationality	South African	South African	South African	South African	South African	South African	South African	South African
2.	Ethnicity	African	African	Indian	White	African	African	White	Coloured
3.	Age	27	39	19	55	21	42	25	50
4.	Do you own a private motor vehicle?	No	Yes	No	Yes	No	No	Yes	No
5.	Do you use public transportation?	Yes	Yes	Yes	No	Yes	Yes	No	Yes
6.	Which is your preferred mode of public transport?	Taxi	Bus	Taxi	n/a	Taxi	Bus	None	Taxi
7.	Is there a safety concern with regards to the public transport facility?	Yes	No	Yes	Yes	No	Yes	Yes	Yes
8.	How frequently do you make use of public transport?	Monday- Friday	Occasionally	Everyday	Yearly	Daily	Weekly	Never	Every day
9.	In South Africa, which transport system functions efficiently?	Taxi. It is most cost effective	Mainly taxis and buses	Taxis are most efficient	Rail, in particular the Gautrain	Taxi and Bus	Taxi	Rail	Taxis are the fastest
10.	In terms of infrastructure, can the current public transport facilities be improved?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	If yes, how?	Yes it can be made safer and provide us with more options	It can incorporate other transport services and modes	Our entire system needs an overhaul to match the likes of overseas	Improved efficiency and safety for commuters	It could be more accessible	It could be made more cost-effective	Safer, more convenient and faster commuting time	Yes, where different types of people are drawn to it
12.	Rating of public transport in terms of safety	Average	Average	Average	Poor	Average	Poor	Poor	Average
13.	Rating of public transport in terms of quality	Average	Average	Poor	Poor	Good	Poor	Poor	Poor
14.	Why don't you use public transportation?	I do but it can be costly	I do but it can be unreliable	n/a	Unreliable	n/a	The road worthiness of taxis and buses is questionable	It is too dangerous	I have to as a necessity with no vehicle
15.	What should government do with old public/ heritage buildings in SA?	They should refurbish and improve them	Replace it with something better	Take it down and erect new buildings	Revive and reincorporate them into society	Update them to fit a modern era	While it is a symbol of Apartheid and colonisation, we must pay tribute and preserve them	We have a rich history and need to celebrate it through preserving the buildings	They are beautiful and must be restored
16.	If there was a new transport hub built in Pietermaritzburg, would you use it & why?	Yes, new developments are exciting	Definitely, We need one	Yes, maybe it will spur government into improving rail infrastructure	Yes, it may lead to increased rail travel	Yes, I would be interested in the amenities on offer	Yes, it may spur economic growth within the city	Yes, we need to reintroduce rail transport within the country again	Yes, I am positive it could celebrate a new era

Appendix D – Informed consent document

Information Sheet and Consent to Participate in Research

Date:

To whom it May Concern

My name is Mohammed Iqbal Muslim and I am a registered student at the University of Kwazulu-Natal. I am currently pursuing my Master's Degree in the field of Architecture. My research document is entitled: "*PERCEPTIONS ON PUBLIC TRANSPORTATION INFRASTRUCTURE: A proposed Transport Interchange for the Pietermaritzburg Railway Station Precinct*".

Further contact details are as follows:

Student Details
Mohammed Iqbal Muslim
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Tel: 031 260 1141

As part of my dissertation, I am conducting research on the Pietermaritzburg Railway Station with the aim of designing a Transport Interchange in Pietermaritzburg.

You are being invited to consider participating in a study aimed at supplementing this research. This will involve interviewing approximately 15-20 participants in and around Pietermaritzburg. The duration of your participation, if you choose to enrol and remain in the study, is expected to be for approximately 15-30 minutes in length.

The information gathered is solely to be used for the purpose of the design of a Transport Interchange and participation is purely voluntary. You are under no obligation to participate and may cease participation at any time as you see fit. There are no known or anticipated risks in participating in the research nor are there are any reward/benefits given for participation.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number_____).

In the event of any problems or concerns/questions you may contact the researcher, the contact details of which are provided above or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details of which are as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

There will be steps taken to protect the confidentiality of your personal information, which records must be retained for a period of five years. Such methods involve storing records at UKZN with access only being granted to specific persons such as supervisors and myself. Furthermore, should reference be made to information provided by yourself in the written report, anonymous quotations will be used.

CONSENT

I _____
have been informed about the study entitled "*PERCEPTIONS ON PUBLIC TRANSPORTATION INFRASTRUCTURE: A proposed Transport Interchange for the Pietermaritzburg Railway Station Precinct*", by Mohammed Iqbal Muslim.

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

I have been informed that there are no known or anticipated risks in participating in the research nor are there are any reward/benefits given for participation.

If I have any further questions/concerns or queries related to the study, I understand that I may contact the researcher as follows:

Mohammed Iqbal Muslim
Student Number: 213530181
Master of Architecture Student
School of the Built Environment and Development Studies
University of KwaZulu-Natal, Howard Campus, Durban
Email: moeiqbal15@gmail.com
Cell: 082 705 3406

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

I hereby provide further consent to:

Audio-record my interview / focus group discussion YES / NO
Video-record my interview / focus group discussion YES / NO

_____ _____
Signature of Participant **Date**

_____ _____
Signature of Witness **Date**
(Where applicable)

_____ _____
Signature of Translator **Date**
(Where applicable)