

**REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH  
ARCHITECTURAL IDENTITY:**

A Proposed Transport Interchange for the Umhlanga New Town Precinct

By

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requirements for the degree of Master of Architecture to the  
School of Community Development and the Built Environment

University of Kwazulu-Natal

Durban, South Africa,

2012

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**COLLEGE OF HUMANITIES**

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Submitted in partial fulfilment of the requirements for the degree of Masters, in the Graduate Programme of Architecture, University of KwaZulu-Natal, South Africa

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. I confirm that an external editor was not used. It is being submitted for the degree of Master of Architecture in the School of Built Environment and Development Studies, University of KwaZulu-Natal, South Africa. None of the present work has been submitted previously for any degree or examination in any other university.

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Geoffrey Richards

2012

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Thank you all so much.

**DEDICATION**

For Nicole

## **ABSTRACT**

Tom Steer, senior associate on the Gautrain Architects Joint Venture states that *"When people arrive in cities with well-organised transport networks, they breathe a sigh of relief. The identity of the transport system forms an integral part of the city's identity and the way it is perceived internationally."* (Theunissen, 2009: 22)

Mokena Makeka of Makeka Design Laboratory agrees saying *"The role that transport facilities play in the creation of an identity for both the industry itself and the city is essential, and one that is often underplayed in this country"* (Theunissen, 2009: 22).

In South Africa today, the public transport industry is perceived negatively by a large portion of the population. This perception is largely rooted in the troubled history of South Africa with Apartheid playing a major role in the formulation of such perceptions. In addition, issues surrounding lack of government funding, supporting infrastructure, safety, reliability, comfort, accessibility and a general state of disrepair hinder the progress within the system. This has resulted in a system that is severely underutilized by the middle to high income population, creating overcrowding on roads through the use of private motor vehicles, and the unsustainable nature of South Africa's transport system as a whole.

This study focuses on the role of identity in architecture, exploring the concept of architecture as a catalytic instrument in the creation, and identification of identity, and how this can be applied to transform the public transport industry as a whole. The intention is to identify and explain the important principles and elements that inform the success of a transport interchange, and how a building can redeem itself and create a new identity.

It is clear through the study that infrastructure is required in the public transport industry. This dissertation looks at the design of a modal interchange facility which seeks to appeal to a wider socio-economic group, and in turn create a more sustainable system as a whole.

One must acknowledge that for any significant change to occur, more than just architecture is required, as architecture in isolation, cannot address all the issues. Identity is formulated through a number of elements, not only built form. The approach will have to be a holistic one and a broad remodelling of the current system is required. Modal interchanges do however form the backbone to this process and act as a vital catalyst in the transformation of the industry.

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## **CHAPTER 1: INTRODUCTION**

### **1.1 INTRODUCTION**

#### **1.1.1 Background**

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

The current public transport system in South Africa 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.

Following the demise of apartheid there is a new sense of life in the South African city. However, cognisance needs to be taken of the troubled versions of its colonial past. The dual nature of the South African city is the product of the dual nature of the 'process of urbanisation' in which the white, coloured and Asian populations have reached the urbanisation saturation levels of first world countries, where as the level of urbanisation among Africans is still in the acceleration phase of third world cities. In 1994 the population levels of urbanised (rural to urban) South African's stood at:

89% of whites

77% of coloureds

91% of Asians

32% of Africans

(Harber, 2011)

It could be argued that this is a direct result of apartheid whereby the Group Areas Act forced black people out of the city into controlled zones known as townships. This forced them away from jobs and economic opportunities.

In recent years there is an assertion that South African cities are sprawling, low density, and inefficient. The spatial form of cities is due, in large part, to apartheid social and spatial engineering and to a lesser extent to the adoption of planning practices that promote suburban over inner city residential development. The notorious Durban 'system' that pre-empted apartheid influx laws was evidence of this. This resulted in sprawling low-density city forms, with distinct spatial separation of land use, in a fragmented, introverted city.

### **1.1.2 Motivation/ Justification for Study**

As a result of the sprawl of South African cities, people living on the city edge are forced to commute on a daily basis to experience all of the opportunities presented within the urban areas. The ability to travel from one place to another is a basic requirement of a successful metropolitan area. As a result of various land use types there is a need for transport, whether it be for people commuting from home to work or for the distribution of goods.

There is little use in providing opportunities in cities if these are only accessible to those who have private transport. 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 is 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.

Due to the lack of infrastructure and state provisions, the taxi industry emerged as the preferred mode of transport for the black population, as it offered the most economical alternative. The industry today represents the most accessible mode of transport. In 2010 it carried 65% of all commuters in the country per day, +/- fourteen million commuters ([www.santaco.co.za](http://www.santaco.co.za)).

There is a general realisation that public transport has a significant role to play in enhancing the urban mobility, reducing road congestion, decreasing the impact of vehicles on the environment and better serving the economy (Walters, 2008: 5).

An intermodal transport interchange offers the opportunity to link various modes of both public and private transport. It offers the public different options of transport to best suit their journey so that they can get around efficiently and conveniently, and facilitates the seamless transition between the different modes within the facility.

## 1.2 DEFINITION OF THE PROBLEMS, AIMS AND OBJECTIVES

### 1.2.1 Definition of the Problem



Figure 1.1- Newspaper Article (The Weekly Gazette 25 August 2011 pg. 3)

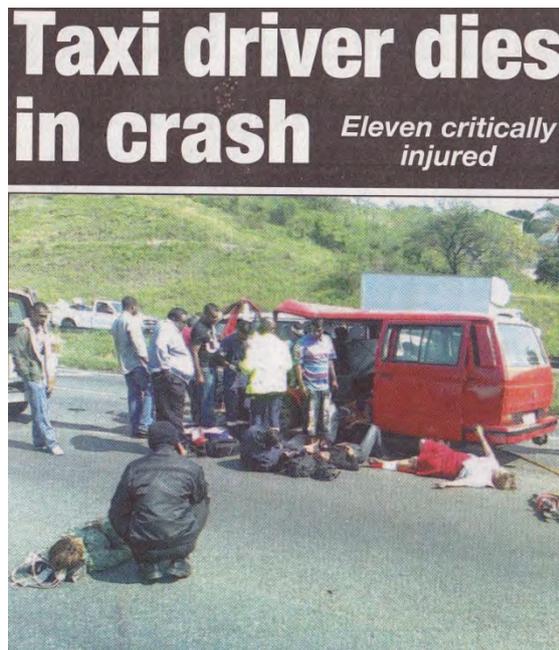


Figure 1.2- Newspaper Article (The Weekly Gazette 01 September 2011 pg. 3)

The public transport infrastructure in South Africa is currently faced with many problems. Unlawful, renegade, and detached are just a few of the identifying terms given to the taxi industry. Drivers are seen not to respect the rules of the road, and are responsible for a number of road collisions (see figure 1.1, 1.2)

On top of that, a large number of their vehicles are badly maintained and are un-roadworthy. As a result there is a stigma attached to public transport as a whole. However the industry is paramount for the survival of the very people who use their services every day.

Rail travel has lost significant numbers of patrons to other forms of public transport. This is due to their rundown facilities and post-apartheid collapse. This is an unfortunate situation that rail travel finds itself in as it is a relatively economic means of travel, and most importantly it provides a hassle free and sustainable journey, which is an extremely valuable asset considering the current state of

the worlds environment and the drastic measure that are needed to be put in place to conserve it. Rail travel has gained a negative perception rooted in apartheid and the associated class distinctions related to this travel mode which, coupled with issues concerning passenger safety, unreliability and uninviting station precincts tend to deter potential commuters.

Private road transport harms the environment through severe carbon dioxide emissions and it has a low passenger count per vehicle compared to public transport, with the majority of

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individuals travelling alone. This means that the space/person ratio on the roads are high, compounding congestion issues.

South Africa currently faces issues of poverty and unemployment, and as a result the majority of the population relies on public transport, as there are no alternate means that are viable. Problems however, arise with regard to this industry:

- There are too many role players within the public transport industry
- The transport industry lacks integration. Each sector has individual management and policies which allow for segregation.
- While mini-bus taxi's are overcrowded, trains and metro busses run relatively empty.

The introduction of new policies and the incorporation of modal interchanges, which has already begun in Johannesburg, may act as a catalyst for the industry. By addressing problems with rail travel and combining that with a better organized road transport system, it can create a more accessible public transport system. The focus is to emphasize how through re-appropriation and re-defining of the formative and descriptive elements of the public transport industry, one can begin to mend its identity. The methodology used ,will be based on the principles of identity formulation, and programmatically expressive architecture. The intention is to explore the measures in which architecture can be used to redefine the industry, through the uses of spatial articulation and configuration that represents the marriage between the private and the public transport industry in a formal, informal and passive manner.

Some of the issues that will be investigated in the document include:

- The effects of urban sprawl on transport
- The origins of modal interchanges
- The facilities and activities that thrive around modal interchanges
- The relevance of sustainability in public transport and how architecture can seek to aid in this regard
- The typology and appearance of modal interchanges
- The current state of public transport facilities
- The effects of apartheid on public transport facilities
- The evolution of the public transport facility

### **1.2.2 Aims**

- To explore the concept of architecture as a catalytic instrument in the creation, and identification of identity, and how this can be applied to provide a redefined identity for the public transport industry as a whole - one that commuters will see as a positive one.
- To derive a set of design guidelines that can be used to create a responsible architectural approach that will promote the use of public transport.
- Architecture is a reflection of society through its configuration. The aim is to create spaces that allow for inclusive, rather than exclusive social interaction between varying user groups within the public transport sector.
- To integrate marginalized users into the public realm, attempting to provide them with representative architecture that enables their endeavours and brings a sense of renewed identity.
- To understand the need for a well planned, sustainable approach to infrastructure provision within the public transport sector.
- To understand the power that architecture has, as an expressive medium, in evoking a positive identity for the public transport industry and how that can facilitate change in the eyes of the commuter.

### **1.2.3 Objectives**

The objective of the study is to generate a clear understanding of the stigma surrounding public transport in a post apartheid South Africa, and the requirements of a transport facility through the collection of raw data, research and analysis of existing principles and theories related to the topic. The intention is to identify and explain the important principles and elements that inform the success of a transport interchange. Restructuring of existing systems, through a well informed, expressive and meaningful architectural approach, will enable the industry to redeem itself and create a new identity.

### 1.3 SETTING OUT THE SCOPE

#### 1.3.1 Delimitation of the Research Problem

The document intends to study the effects of apartheid on South Africa and how urban sprawl has caused the majority of people to rely heavily on poor public transport to get to economic opportunities within the city. The document will look at the issues surrounding public transport in South Africa and the current state of its services. It will also address global issues surrounding urban transportation and what measures can be introduced to allow for a sustainable approach to planning and land-use. It also intends to study the concept of identity, and how architecture has the innate ability of playing an important role in defining identity, and moulding space in a manner that leads to social significance.

The research will look at providing an appropriate architectural approach to a sustainable public transport interchange. It will explore the methods by which to address the users perception of current facilities, and create infrastructure that will appeal to all, and in doing so set guidelines for building layout, function and aesthetics. 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.

The 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

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)

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.

Apartheid - Was a system of legal racial segregation enforced by the ruling party on South Africa between 1948 and 1994, under which the rights of the majority 'non-white' inhabitants of South Africa were curtailed and the minority rule of the whites was maintained.

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Sustainable - Conserving an ecological balance by avoiding the depletion of natural resources, or capable of being continued with a minimal long-term impact on the environment.

Modal Interchange - Refers to a facility catering for a change in mode of transport. This change could occur between busses, trains, boats or ferry's, aeroplane, minibus taxi, foot, private vehicles and bicycles.

Minibus Taxi - Falls between private transport and public bus transport. It generally has a fixed route, but has the added convenience of stopping anywhere along that route to either pick up or drop off passengers. They can be unreliable as there is no fixed time schedule, and is generally unsafe. The majority of vehicles are sixteen seater mini busses.

### **1.3.3 Stating the Assumptions**

- There is a stigma surrounding public transport in South Africa.
- What people perceive as the world around them is specific to the individual by varying degrees.
- Architecture can be given a 'form' of universal meaning or identity, within a specific community at a specific time.
- There will be a rise on the reliance of public transport as fuel prices increase and environmental issues become more relevant.
- Architecture in isolation cannot address all the issues surrounding the public transport industry. Individual perceptions of identity is affected by many factors.
- Identity cannot be positively reflected through the creation of an architectural expression devoid of meaning and authenticity.

### **1.3.4 Key Questions**

The following key questions will be addressed in this dissertation:

#### **PRIMARY QUESTIONS**

- What is the appropriate architectural response for a modal interchange in South Africa that can work toward and alter the perceptions, redefine the identity of the public transport industry, and in turn be appealing to a wider socio-economic group?

## SECONDARY QUESTIONS

- How does architecture begin to redefine, re-evaluate, and re-appropriate a system, which issues stem from segregation and disempowerment?
- Who uses public transport and what are their requirements from this particular building type?
- What is the public's perception of public transport in South Africa and what circumstances led up to that perception?
- Can a transport interchange provide the catalyst needed for change in South Africa public transport?

### **1.3.5 Hypothesis**

- A well informed, expressive and meaningful architectural approach for a transport interchange may directly affect the public's perception and begin to redefine the identity of the service.
- If architecture can shape identity, then the stigma surrounding public transport may be alleviated.
- If the negative perceptions surrounding the public transport industry are eradicated, and the identity redefined, then the overall number of users will increase.
- The layout and design of a transport interchange may significantly influence the public's decisions on travel. A transport interchange has the ability to encourage the use of public transport and positively change the public's perspective on the system.

## 1.4 CONCEPTS AND THEORIES

### 1.4.1 Identity

Looking at the ways in which architectural identity can either represent and redefine certain groups we should understand what concept of identity will be applied to this document. Identity is a product of various different factors including race, language, economic status, occupation, religion, ethnicity etc. It should not be assumed to be necessarily inherent to groups, nor is it part of or a product of social processes such as modernization (Mthethwa, 2001: 13). The concept of identity poses challenging questions for architects. Why should architects design buildings that reflect the identity of its inhabitants? As far as the concept of identity is concerned, are groups of individuals not defined by far more ways than just architecture or simple stereotypes?

The two concepts of 'culture' and 'identity' are closely related, and also pose interesting questions for architects. Why should architects incorporate an awareness and understanding of culture? When we take into consideration how much people nowadays are affected by cultural globalisation, surely the effects that has on the culture of specific groups make it extremely difficult for the architect to determine what type of culture they are designing for. These issues if cultural indifferences are also relevant to identity.

The development of the concept of identity will be traced through the theory of identity, relating to the changing perspectives on the nature of the human subject, together with developments in architectural practise and thinking. This will be done by analyzing the concept of critical regionalism by Kenneth Frampton and looking at the concept of locally appropriate architecture created through analysing the relationship between man and the built environment- the concept of Genius Loci by Christian Norberg-Schultz.

### 1.4.2 Lynch's Theory: The Image of the City

Kevin Lynch explains in 'Image of the City' (1960), how individuals orientate themselves with the environment. The base of Lynch's theory is that of place legibility, which is essentially the ease with which people understand the layout of a place (Lynch, 1960: 3). Visual quality and legibility are extremely important to create this mental image in the mind of the user. Legibility can be captured by colour, shape, motion, light, smell, touch and gravity. A good image gives the possessor an important sense of emotional security (Lynch, 1960: 4).

The environmental image that the user has of a space consists of identity (distinction from others), structure (built form), and meaning (practical and emotional) (Lynch, 1960: 8). They all appear together to create an overall image. He says that an image must be sufficient and true, allowing the individual to operate within their environment to the extent they desire. The image should be open ended and adaptable to change allowing the individual to continue to investigate and organise reality (Lynch, 1960:9). He presents his work as an agenda for urban designers. They should design a city that gives room for three related activities: mapping, learning and shaping. People should be able to gain a clear mental image of their environment, they should be able to learn how to navigate this environment by training and they should be able to operate and act upon that environment. The theory is based on 5 'markers' namely paths, districts, edges, nodes and landmarks (Lynch, 1960: 47-50).

It is possible to draw out many varying relationships between the various elements, but most importantly Lynch concludes that a highly imageable city would be well formed, would contain very distinct parts forming the whole, and would be instantly recognisable to the common inhabitant. He also found that a well formed city relies heavily upon its most prominent element- the path (Lynch 1960:49). The rest of the elements are just as important though as long as they are placed in good formation, are meaningful, distinct and not confusing.

### **1.4.3 Critical Regionalism**

For an intermodal facility to thrive in urban areas, it must integrate with the existing urban fabric and have strong links to existing urban infrastructure and the surrounding areas. Kenneth Frampton's critical regionalism explores the relationship of new architecture into an existing context. A focus is placed on creating meaningful spaces and buildings by relating new developments and their geographical contexts. It speaks of architects taking a critical consideration and understanding for local conditions including climate, physical and structural elements in the landscape and quality of light. It seeks regional appropriateness in a local context. The approach of various post modernists to culture as a resource for creating identity, is criticized by Kenneth Frampton. Critical Regionalism argues that architects should look beyond just regional appropriateness of the local architecture. There should be a consideration of local qualities such as the landscape and light quality specific to the site, creating a local appropriateness. Critical Regionalism can then be considered as an alternative to local-based approaches to identity.

#### **1.4.4 Genius Loci: A 'sense of place'**

Inherent to a paper looking at identity and how a public building can reflect the identity of a particular group or community, it is important to understand how this could bring about a genius loci: 'place making' or the placeness of a place. A theory of Christian Norberg-Schultz was developed in an attempt to explore the relationship between human beings and the built environment. The genius loci concept, is a reality which an individual faces daily. The individual dwells and feels at peace when they can identify with a place. In the built environment it means the process of visualising the genius loci. In order for this visualising process to occur, architects need to create a meaning to the space in which the individual finds themselves (Norberg-Schultz, 1980: 5)

The concept of 'genius loci' is a complex and multi-layered one. Some authors have similar views whilst others are conflicting. The 'genius loci' of a place cannot be constant as all individuals experience a setting or place differently. It relates a lot to how an individual's emotions and feelings are affected in a specific environment. At a very practical level many of us can relate to an 'instinctive feeling' or a 'spatial quality' (Breetzke, 2010: 10). It is not necessarily something that could be put into words, but rather a 'sense of place' which can be brought through from an individual's experience of a space, thus creating identity - that is given rise from the shape of the built form, materials and technology used and the urban fabric surrounding the building.

This theory, as in Lynch's theory emphasizes the importance of identifying with a specific place and being able to navigate around it. It directly links to the various components that constitute the legibility and sense of a city and how one feels in it. It also links to a deeper, more psychological level as to how an individual perceives an environment, space or place. This highlights the importance of creating architecture that has a positive impact on those experiencing it by creating a space where careful thought has been taken to create a positive genius loci or 'sense of place'.

## **1.5 RESEARCH METHODS AND MATERIALS**

### **1.5.1 Introduction**

This section will define the research approach and methodology used in this dissertation. It describes the procedures for data collection and also identifies the techniques and methods used to gain this data. Based on the answers that are being sought, decisions are made as to what type of analysis is required. This can be done by observation, questionnaire, interviews, surveys or analysing journals. Regardless of the method there should be neutrality. The researcher will not try to manipulate the data to gain the desired outcome or to prove a particular viewpoint.

The research method used in this dissertation is the qualitative approach. Due to the complexity of the topic, structured and unstructured interviews were conducted with a target group. The questions posed were based upon areas of expertise or experience of the person being interviewed. The key participants included amongst others, professionals with experience in transport and transport architecture and the Umhlanga New Town precinct, city officials, residents of the Umhlanga New Town precinct, workers and commuters. The research methodology will be examined in terms of primary and secondary research.

Approaches used for the process of gathering data will be conducted using the following methods:

### **1.5.2 Primary Research**

The primary research consists of data obtained by the author. The data will be analysed and conclusions will be drawn and documented in order to develop the design of a brief for the proposed modal interchange. The research methods will consist of structured and unstructured interviews, surveys, case studies of current public transport facilities and commuter patterns within them. The primary research will consist of two major sections:

- Structured interviews with a target group of professionals involved with the Umhlanga New Town precinct and transport in South Africa
- The analysis of case studies which will include further interviews with the architects involved.

**a.) Structured interviews with a target group of professionals:**

To obtain clear and truthful information, professionals involved with the conceptual and physical design of the Umhlanga Ridge New Town precinct have been interviewed to gain firsthand knowledge of the ideas and reasoning for certain decisions that were made. Various professionals involved with public transport in South Africa have also been interviewed to understand the current situation and vision of the industry. They include:

Erky Wood- Urban designer and director of GAPP Architects & Urban Designers involved in the urban design of Umhlanga Ridge New Town.

Rory Wilkinson- Head of Planning at Tongaat Hulett and primary developer of The Umhlanga Ridge New Town precinct.

Nathan Iyer- Director of Iyer Rothaug Collaborative, involved in the design of a BRT system for Durban.

Jarendra Reddy- Engineer at GOBA (Pty) Ltd, involved with the planning of the BRT system for Durban.

Logan Moodley- Head planner at eThekweni Transport Authority, involved with the planning of a BRT system for Durban.

Philip Rutkiewicz- Architect at Osmond Lange Architects and Planners, principal architect on the Rea Vaya Bus Rapid Transit System in Johannesburg.

Andrew Marsay- Ex head of the transport planning division at Arup, principal planner of The Gautrain Initiative.

Leon Roets- Planner at Siyazi Transportation Services

**b.) Case Studies**

Two case studies will be analysed which are situated in South Africa. These studies will show how architects have dealt with problems and design issues in a local context, with regard to a transport interchange.

- Metro Mall Market and Taxi Rank, Newtown- Johannesburg. Urban Solutions Architects and Urban Designers.

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- Pan African Shopping Centre and Taxi Rank- Alexandra- Johannesburg. Stefan Antoni Olmesdahl Truen Architects

Primary research involves capturing data via the qualitative method. The data obtained during the site visits is captured, analysed and then documented. The following groups of people will be assessed:

- Group 1: The Architects
- Group 2: Commuters using public transport and those using private transport
- Group 3: Bus and Taxi Drivers, and traders using the facilities

### **Group 1:**

The architects involved in the design and construction process will be interviewed to gain insightful information into the projects. They include:

- Ludwig Hansen- Ex director of Urban Solutions Architects and Urban Designers, principal architects on the Metro Mall Development
- Greg Truen- Director of Stefan Antoni Olmesdahl Truen Architects, principal architects on the Pan African Shopping Centre and Taxi Rank development.

### **Group 2:**

The commuters using both public and private transport will be analysed through the receipt of questionnaires. They could be mailed, be done face to face where it is verbally undertaken, or can be done in a group. It is vitally important to understand the various backgrounds of the people interviewed. The questionnaires may need to be in various languages to gain optimum data. Generally questionnaires which force the person to write their answers down are more successful as they take the time to analyse each question individually. Open questions tend to be arbitrary rather than distinct and clear. Questions will include amongst others:

- What types of transport do you use?
- How often do you use public transport?
- How would you rate the various modes of travel?
- What changes, if any, do you believe would benefit you as a user?
- Why do you not use public transport?

**Group 3:**

The drivers and traders will be interviewed to gain their insight into the facilities provided and what they would require from a transport interchange. These surveys will be cross referenced with the case studies to identify comparisons and possible differences between the authors analysis and the architects comments, and the users of the facility on a daily basis.

**1.5.3 Secondary Research**

Secondary research is research that involves the collection of information and literature from studies done by other researchers that contributes to the resolution of the research problem. Information will be obtained through books, journals, internet and structured reports by relevant bodies. The secondary research consists of:

**a.) Literature Review**

This involves an extensive review of literature on transport and its current state in our country, the concept of identity and the role that architecture plays in defining identity. This is done in order to understand the issues relevant to the topic, the strategies employed and the criteria used to assess success. Data is obtained through books, websites, newspaper articles, reports, and unpublished dissertations.

**b.) Precedent Studies**

The data obtained from precedent studies is done through books, journal articles and the internet. The investigation of existing buildings will be documented and findings and conclusions will be stated in the dissertation. Precedent studies are not necessarily building typologies that are the same as the dissertation proposal, but rather are selected for specific ideas, concepts or issues that the author feels are relevant to the document.

**1.5.4 Conclusion**

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.

## **CHAPTER 2: IDENTITY**

### **2.1 INTRODUCTION**

Architecture is in essence, the practise of designing the world we live in. It is a physical expression of the way of life of a particular society. In its ability to mould spaces and hence encourage or discourage social interaction it reflects our cultural norms - 'identifying' each society as unique. What is not clear, however, is how significant architecture and urban form are in the totality of how individuals and communities shape their identity in the current condition. By seeing architecture and urban form as a part of the greater phenomenon of 'identity' we can advance our understanding of the impact that changes or design of buildings and places have on communities (Jaimeson, 2009: 1). According to Stets, J & Burkes, P, when formulating identity, one has to structure the identifying elements in a manner that is indicative of the entity they are intended to represent. For this reason it could be argued that the most appropriate way to redefine the public transport industry today is through the redefining of its formative, expressive and operational elements.

*"An architecture description is a formal description of a system, organized in a way that supports reasoning about the structural properties of a system. It defines the system components or building blocks and provides a plan from which objectives can be achieved, and systems developed, that will work together to implement the overall system"* (Adam, 2011). Therefore, with regard to the public transport industry, it is safe to assume that one could use architecture as a tool for redefining its spatial and operational systems, while instilling a sense of identity at the same time.

The aim of this chapter is to investigate the concept of 'identity', and how identity is formulated in individuals, through the historical development path of identity. It will also investigate identity and localness in architecture, and provide examples of work relating to the subject.

## 2.2 THE CONCEPT OF IDENTITY

### 2.2.1 Introduction

The concept of identity is a complex one. This dissertation aims to understand identity with regard to architecture and society only. The concept needs to be investigated on a personal and social level- in its most basic form. This will provide understanding on how individuals acquire, portray and maintain identity.

### 2.2.2 Defining Identity

Identity is intricately linked to culture as a result of individuals from certain groups or societies sharing common values and ways in which they perceive the world around them. It is therefore safe to assume that identity is the product of a set of factors and influences through which individuals see themselves and through which others see them. Jenkins (1996) define identity in the following way: *"Identity refers to the ways in which individuals and collectives are distinguished in their social relations with other individuals and collectives"* (Jenkins, 1996: 4).

There are theorists who believe that modern identities are becoming disjointed and broken up. They argue that a distinctive type of structural change is transforming modern societies (Hall, 1992: 274). This is fragmenting the cultural landscape of class, gender, sex, ethnicity, race and nationality, which previously gave us firm locations as individuals. These transformations are shifting our personal identities, undermining our sense of ourselves as integrated subjects (Hall, 1992: 274). In order to understand the changing perspectives on the nature of human beings, Stuart Hall (1992) gives the following, very different, historical definitions of identity:

- The first definition of identity is derived from the enlightenment subject. It was based on the concept of human beings being fully centred, unified individuals, equipped with the capacity of reason, consciousness and action, and a stable central inner core. In this instance an individual's identity first emerges when the subject is born. The identity then evolves and develops as the individual grows older, but still remains the same at the core. The individual is endowed with a fixed identity from birth to death by means of ethnicity amongst others. This was a very 'individualist' conception of identity. (Hall, 1992: 275)

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- The second definition is derived from the concept of the sociological subject, whose inner core is formed in relation to significant others in their lives, who mediated to the subject the values, meanings, symbols - the culture - of the world that he or she inhabited. According to this view, identity is formed through the interaction between self and society. In this situation identity is something that is passed down from one generation to another, and from contacts outside the immediate social world. This definition bridges the gap between the inside and outside - between the personal and public. (Hall, 1992: 276)
- The third definition of identity is derived from the post-modern subject, conceptualized as having no fixed, essential or permanent identity. Identity becomes formed or transformed continuously in relation to the ways we are represented or addressed in the cultural systems that surround us. It is historically defined, rather than biologically. The consequence of this position is that identity can be selected, imposed, assumed, or rejected according to how subjects perceive themselves, or how they are categorised by others. This kind of identity (trans spatial) is variable in space and time, and a wide range of cultural resources can be used to construct such identities. (Hall, 1992: 277)

These transforming ways of defining identity can be traced back to the treatment of identity in South Africa. Historically, identity was considered to be fixed through ethnicity. Ethnic categories have long been used to define groups of individuals, creating a situation of "us and them" (Mthethwa, 2011: 54). Taylor (1997) states that the concept of identity based on race has origins traced back to the eighteenth century. By the nineteenth century writers were not simply classifying humans according to physical differences such as skin colour, hair type and facial characteristics, but were beginning to also suggest that certain races were superior to others (Taylor, 1997: 111). These classifications of persons according to physical differences gave rise to racism.

It was no coincidence that these ideas on race emerged at the same time that European nations were developing colonial empires and the slave trade between Africa and America was flourishing. If Europeans had accepted that Africans were human beings of equal significance and importance then it would have been extremely difficult for them to justify the slave trade. Racial theories suggested that Blacks were inferior to Whites, and less

intellectually developed, suggesting they were better suited to manual labour (Taylor: 1997, 116).

When biological features are used to define identity, it understandably tends to be inflexible. Hall (1992) argue that this inflexible approach, has less of an influence on an individual as a result of social processes occurring in modern society. *“The adult social identity one forms depends on (a) available resources derived from the community, (b) how an individual packages these resources into a configuration that has meaning in that community, and (c) how that person then strategically invests these resources in the lives of people in that community,”* (Cote & Levine, 2002: 123). Compared to identity construction through the historical definitions previously mentioned, this approach provides flexibility in that the individual could either define their own identity, in the private sphere (spatial), or their identity could be defined by and in relation to others, in the public sphere (trans spatial). These two types of identity formation may be similar, but can also be contrasting, as social identity is based very much on the public's perception of the individual. Personal and social factors relating to identity can also be related to architecture, in terms of creating relevant and meaningful environments which guide and allow man kind to develop their personal identities effectively. This can be done through spatial articulation, encouraging access and opportunities for social interaction to occur.

A further aspect of the issue of identity relates to the emergence of post modern culture, in particular to the process of globalization and its impact of cultural identity. Postmodern theorists claim that the boundaries between cultures are becoming blurred. According to McGrew (1992) globalization refers to those processes, operating on a global level, which cut across national boundaries, integrating and connecting communities and organizations in new space-time combinations making the world in reality and in experience more interconnected. This of course has a huge impact on an individual's sense of identity. Individuals are exposed to far more resources than ever before, and can therefore draw on influences from infinite sources. Postmodern theorist will argue that who we are as individuals and where we belong have become much less certain because of the rapid change occurring around us. Ernesto Laclau (1990) uses the concept of 'dislocation' when describing modernity. He argues that modern society has no centre, no single articulating or organizing principle, and do not develop according to the unfolding of a single cause or law. It is constantly being 'de centred' or dislocated by external forces.

## 2.3 ARCHITECTURE AND IDENTITY

### 2.3.1 Introduction

Various similarities have been drawn between the symbolic function of architecture and the formation of both social and personal identities. This has reached the point where the idea of 'architecture as identity' now rivals 'architecture as space' and 'architecture as a language' as one of the principal themes in architectural discourse (Abel, 2000: 141). Architects and urban designers have a unique responsibility for the way that the cities we know change. When they change a place, they are changing the way we see ourselves; they are affecting our identity. Lynch, K (1960: 2) says that the city is not a static urban form, but rather one that is ever changing, shaped by various hands and minds. Only partial control can be exercised over this change, and that there is no final result, rather just a succession of phases. The identity of a place and its relationship with a community matters as it is part of the communities sense of belonging. The significance now attached to the concept of place identity as the interrelation of mental processes, social activity and formal attributes is one of the more important results of his research.

There's a growing consensus in the architectural profession that the special 'identity of place' matters. This seems to be based on the perception that globalisation is creating an undesirable uniformity in cities around the world (Adam, 2011).

Lee Polisano, global president of the American Architects, KPF, one of the world's leading tall-building architecture companies states " *there is a large danger of repetitiveness and sameness happening in our cities*" (Adam, 2011). Stefan Behnisch, principal of leading German practice, Behnisch Architekten says that " *one of the errors of international architecture is that we thought we could build the same thing everywhere*" (Adam, 2011).

Two techniques for giving new architecture an identity to relate a building to its location emerged: the spirit of place and the symbol of place (Adam, 2011).

The principle of the spirit of the place is explained by Ken Yeang of leading British firm, Llewellyn Davis Yeang, " *Every site is different and by responding to the locality we create a natural diversity*" (Adam, 2011). He calls this "systemic identity". Alison Brooks, a Canadian architect practicing in Britain, described this briefly as an abstract reaction to "found conditions". It is this principle that allows Polisano to claim that a tall office building, of a similar height and identical materials in the Middle East and London, has a local identity

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because it responds to individual aspects of its site, its orientation and the limitations created by adjacent sites. He says, “*Local forces become local manifestations of local circumstances*” (Adam, 2011).

Choosing a symbolic identity relevant to the location was described by German architect, Jurgen Mayer, as finding “*certain elements that are local that we could interpret and make into something architecturally new*” (Adam, 2011). It is this process that lay behind the imagery that the Spanish architect Enric Mirales and his Italian partner Benedetta Tagliabue chose for the Scottish Parliament. Using boats as a symbol of Scottish identity is not how most Scots see their national identity but was, as Tagliabue said, because as architects “*you have to get the best of what you perceive*” (Adam, 2011).



Figure 2.1- The Scottish parliament Building by Enric Mirales. ([www.topboxdesign.com](http://www.topboxdesign.com))

The architects were clear that the choice of symbolism was personal. For Alison Brooks it has to do with “her own personal obsessions”. Jurgen Mayer says that, while there’s always a client and city, “*the architect has to make the proposal*” (Adam, 2011). Ken Yeang tells us that “*the only way you can work through the complexity of design is to be intuitive*” (Adam, 2011). None of them attempted to analyse or discover the way the relevant community saw the identity of their place. On the contrary, Sheila O’Donnell of the Irish architects,

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O'Donnell and Tuomey, tells us that *“we find that people want the details of their town but we want to look at the way people did things in the past - the landscape, the climate”* (Adam, 2011).

This seems to be based on concern that local identity might force them into something traditional. Indeed, there seems above all a need to be new and original. Sheila O'Donnell prefaced her remarks about what people want with the statement that *“we want to relate to the context but not look like buildings of the past”* (Adam, 2011) Alejandro Polo states that *“Every building we do is not like what is already there but the technologies and possibilities of today make a new identity”* (Adam, 2011). Ken Yeang maintains that you must *“reinterpret in a modern way”* (Adam, 2011). Alison Brooks believes that *“the authentic is genuine and original and if you do this anywhere in the world you will give identity”* (Adam, 2011). Jurgen Mayer tells us that *“forward-looking innovation should be the driving force for identity in the future”* (Adam, 2011).

These approaches to reason highlight modernists lack of concern with issues such as culture, and more emphasis placed on logical issues such as local climate and landscape. As there is little or no attempt to discover the relationship between site-specific design, the symbolic creations of the architect and the particular connection the community has with their city, we don't know if communities identify with these new designs. It is possible that the communities that live in these places see these professional and personal choices as having a connection to the particular, local and recognisable characteristics of their place. It is also possible that they do not.

This section will look at the various theories of identity relating to the built environment. It will attempt to trace issues of identity in architectural theory and practise.

### **2.3.2 The Local Approach to Identity**

Various post-modernist theories that were developed and put into practice by both Western and third world architectural theorists and practitioners were all a search for regional and local appropriateness reflecting the historical development of identity in social theories (Mthethwa, 2011: 62). These developments in architecture, in general, generated interest in culture and its corresponding local traditions, as it was perceived to embody the desired regionally and locally appropriate qualities (Mthethwa, 2011: 62). Therefore local architecture became the precedent upon which architects based their designs in seeking for local or regional appropriateness and identity. Local styles inspired both modernists and post-modernists alike, drawing inspiration from local builders, and how they have dealt with issues of place in formulating identity.

Oliver (1997) defines local architecture as the local or regional dialect, the common speech of building. It comprises mostly of dwellings built by their owners, by communities that pool resources, or by local specialized builders and craftsmen (Oliver, 1997: xxi). He further says that all forms of local architecture are built to embody specific needs and accommodate particular values and economic conditions, as well as ways of living for the culture that has produced them (Oliver, 1997: xxii). Thus, even a dwelling in its simplest form may reflect the material and spiritual worlds of its builder and occupier.

Oliver (1997) states that local architecture is of a dual nature:

- Social structure, belief systems, and behavioural patterns strongly influence building types, their functions and meanings, though they differ in their specific applications among people throughout the world
- Environmental conditions, material resources, structural systems and technologies all have an effect on architectural form.

As a result of these qualities, there have been numerous uses of local architecture. Oliver (1997) argues that people tend to generalize when they term architecture as local, and he goes to say that it is reasonable to question whether local architecture is even still a single phenomenon. However he says that a number of common characteristics can be identified to many architectural types that utilized local architecture as a source of inspiration:

- Architecture as an iconic, picturesque evocation of symbolic identity
- Architecture as determined by climate, material, or function

- Architecture as the embodiment of experiential, emotional, spiritual and sensory qualities. (Oliver, 1997: 12)

### **Iconic Evocation of Symbolic Identity**

Architects whose work evokes symbolic identity often view regional architecture in terms of local archetypes. These archetypes are seen to be pure, wholesome, timeless and locally rooted, expressing an authentic local identity and character of the individuals who built it. This is contrasted with imported architectures which are thought of as unsuitable to local needs, conditions or identity. (Pavlidis, 1997: 12)

The focus of this revivalist approach is to investigate locally derived forms, free of external influences, and restore or recreate them in a modern setting. It is an attempt to try and recapture the past presumed to be timeless and expressive of the identity of a region and its people. Picturesque archetypes of local architecture are normally constructed through categorization of a few aspects of a building including the plan, the common features of the elevation, decorative details or shapes of openings. These detail when reproduced lend authenticity to the new architecture. They are best achieved through the use of traditional building materials and methods. New technology and materials are reluctantly used, only when locally based materials or construction methods are unavailable or impossible to achieve do to certain constraints surrounding the new design. (Pavlidis, 1997: 12)

In the late twentieth century, fantastic interpretations of the local architecture have occurred all over the world. They express reaction to the perceived anonymity brought about by extensive adoption of the international style ; they express nostalgia for the environments left behind by recently urbanized populations (Waterson, 1997:12).

### **Climatic, Material and Functional Determinism**

Until the early twentieth century Western architecture was dominated by examples of historical revival. Modernists wished to free themselves from these traditions, and did this through their interpretation of local architecture as having 'timeless' qualities upon which to base an architectural alternative. Modernist theories were based on the belief that architecture should reflect rational responses to building methods and materials, climatic and topographic site conditions, and to human activities (Oliver, 1997: 13).

The success of local architecture was assumed to be the result of rational responses to locally available materials, climate and requirements of use. Modernists perceived local architecture as been:

- Severely utilitarian in its use of materials and technology
- Functional with respect to adaptation to climate, accommodation of activities and utilization of site
- Beautiful in its sculptural expression of mass and volume as a result of manipulating the plan and section to accommodate the needs of the user. (Pavrides, 1997: 13)

In 1913 Adolph Loos stated that the lessons learnt from the architecture of peasants was not necessarily its forms but the way in which the form was a direct response to its function (Oliver, 1997:13). Frank Lloyd Wright agreed, describing local architecture as *"folk buildings growing in response to actual needs, fitted into environment by people who knew no better than to fit them to it with native feeling."* (Oliver, 1997: 13) Wright continues that local buildings were superior to self conscious academic attempts to use a historical style in generating architecture (Pavrides, 1997: 13).

### **Emotional, Spiritual and Sensory Embodiment**

Local architecture, which was initially used to justify rational, modernist design, was later used to criticize it. Critics believed that the wide application of modernist architecture during the 1950s and 1960s created an architecturally bland and monotonous environment.

One of the greatest advocates of local architectural traditions was Bernard Rudofsky. For him, the purpose of studying local architecture was to *"enrich architecture in the industrial countries and help with their architectural plight"* (Rudofsky, 1997: 14). Rudofsky's approach went beyond the obvious picturesqueness of local architecture. He sought to identify and present the qualities of regional architectures that conveyed a sense of wellbeing. These qualities included human scale, great views and visual richness. They also included features which heighten social interaction, such as places for small groups to gather or for chance encounters to occur. (Pavrides, 1997: 14)

Architects looking at local architecture for its experiential qualities wanted to redefine the modernist allegiance to a set of formal design principles. They wanted to create an interesting architectural experience, and to shape buildings that would change people's feelings. They

believed they could enrich the expressive possibilities of architecture by expanding on its formal qualities to include a full range of local forms, materials, colour sensibilities and design principles (Pavlidis, 1997: 14).

The goal of the experiential approach was to enhance the qualities of habitation, to create places where inhabitants will feel at home. These qualities will enhance the act of dwelling, which can be learnt from local architecture without actually mimicking the prototype, preventing bland, modernist environments from occurring. (Moore, 1997: 14)

Rudofsky's principle is one of many local based approaches to identity. The other local based approach to identity is that driven by cultural patterns (Mthethwa, 2011: 66). Theorists such as Kenneth Frampton, criticized the local based approach to identity and that gave rise to Critical Regionalism. Critical Regionalism can therefore be seen as an alternative approach to local based identity. This will be discussed in section 2.3.3.

### **Finding Local Appropriateness Through Local Architecture**

Architects like Hassan Fathy in Egypt, Charles Correa in India and Geoffrey Bawa in Sri-Lanka, to name but a few, have explored local architecture and its building traditions, as well as the cultural customs and values of the local inhabitants, to develop an architectural expression appropriate to local conditions, with a continuous emphasis on continuity and evolution, rather than radical modernization.

In a time when modernism rejected traditional and historic models, Fathy attempted to maintain or synthesise tradition and technology into his work, and thus attempted to revive Egypt's local architectural traditions and techniques by using local materials and craftsmanship (Mthethwa, 2011: 94).

Fathy's designs were guided by six general principles:

- The primacy of human values in architecture
- The importance of a universal rather than limited approach
- The use of appropriate technology
- The need for socially orientated, co-operative construction techniques
- The essential role of tradition
- The re-establishment of national cultural pride through the act of building. (Steel, 1997: 12)

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These principles can be seen in the Gournah Mosque near Luxor, Egypt. The design is indicative of the local architecture and responds to the desert climate well, while using enclosed courtyards and domed and vaulted roofs. He uses a play of light to bring the architecture to life. The use of local materials, in this case mud bricks, encouraged the use of ancient craft that included lattice mud work (Steel, 1997: 16).



Figure 2.2- The Gournah Mosque by Hassan Fathy, Egypt. ([www.greatbuildings.com](http://www.greatbuildings.com))

Charles Correa derived his architectural style from Indian climatic conditions and culture, and has therefore effected a local response to decolonisation. He speaks of the Indian sky been the greatest influence on his work. The harsh climate and monsoon season that India experiences need to be taken into consideration when designing spaces that are comfortable. In his essay "The Blessing of the Sky" (Correa, 1996: 19), Correa says that *"for in a warm climate, the best place to be in the late evenings and in the early mornings, is outdoors, under the open sky."* He argues that true enlightenment cannot occur within a closed box, but rather in the outdoors, under the open sky. This open-to-sky concept had practical implications for the inhabitants too. To the poor in their cramped dwellings, the roof terrace and courtyard represent an additional room, used in many different ways during the course of the day: for cooking, for talking to friends, for sleeping at night, and so forth (Correa, 1996: 18).

Kenneth Frampton in his essay titled "The Works of Charles Correa" (Frampton, 1996: 8) says that four factors ultimately influenced Correa's work:

- Strong sunlight
- Plentiful labour

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- "Open to the sky space"
- "Tube house"

The Tube house was conceived as a means to buffer the Indian sub-continent climate, without the use of air-conditioning, allowing for energy to be conserved in a society that, in the main, could not afford mechanical ventilation of any sort. The form stemmed from the Moghul tradition and in part from the megaton form adopted by le Corbusier (Frampton, 1996: 8). The generic type created in 1962 was the complete opposite of the open-to-the-sky concept. It was a narrow dwelling, twelve feet wide, with sloping roofs and vents situated at the point of their intersection. The planning focussed on an internal courtyard, which was barely open to the sky. The reason for this was clearly to shield the house during the heat of the day, while still allowing for cross ventilation to occur. Hot air would be forced through the tube form and exhausted out through the vents. (Frampton, 1996: 8)

An early example of the Tube house was a housing intervention for the Gujarat Housing Board. It won first prize in an all-India competition for low-cost housing. The program specified walk-up apartments, but Correa's row house intervention provided the same density and bigger living spaces per family. Inside the unit there are almost no doors which promotes cross ventilation, with privacy being created by subtle level changes. (Correa, 1996: 240)

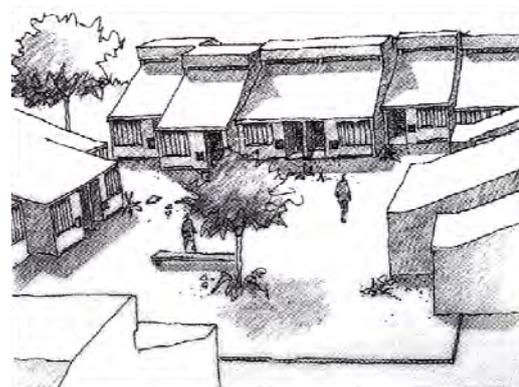
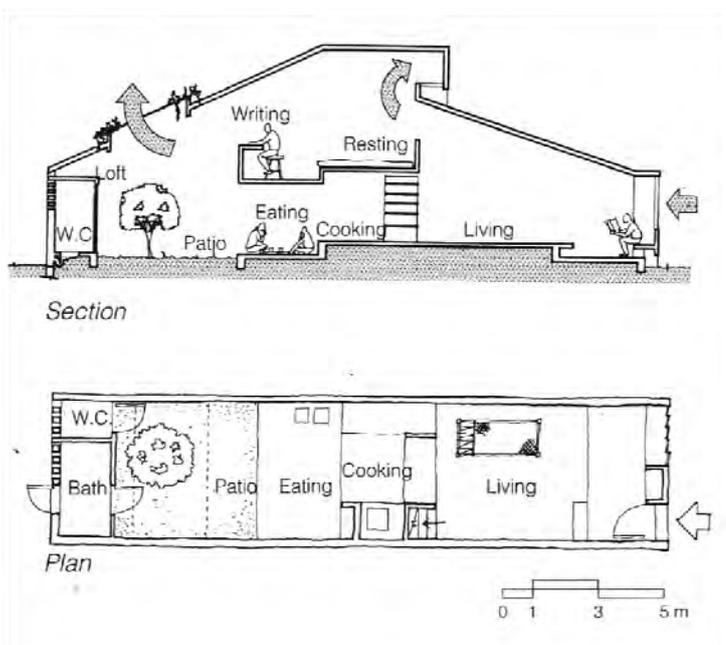


Figure 2.3- A plan and section of the Tube house showing large living spaces and the allowance for cross ventilation. (Correa, 1996: 240)

Figure 2.4- A perspective sketch of the row housing concept employed. (Correa, 1996: 240)

### **2.3.3 A Critical Regionalist Approach to Identity**

The approach to architectural designs related to cultural connectivity, as in local architecture, was criticized by advocates of Critical Regionalism such as Kenneth Frampton and the Greek Architects Alexander Tzonis and Liane Lefaivre. Critical Regionalism still addressed issues of local appropriateness, but went beyond that by proposing a design approach based on structural elements of the local context. This included local qualities such as the landscape, light qualities, culture and ecology specific to the location. This design approach acknowledged the availability and benefits of modern materials and technology but used it to build on what was locally appropriate (Mthethwa, 2011: 115). Ingenious use of local materials played a central role in architectural examples of Critical Regionalism. In general, Critical Regionalism proposed resistance to the homogenization of the built environment that resulted from the modernization of product manufacturing and construction techniques (Nesbitt, 1996: 469). It seeks an architectural synthesis between nature and technology, creating an even greater cultural connectivity than post-modern theories as it rooted the local culture to its physical, social and ecological setting.

Kenneth Frampton, one of the greatest advocates of locally appropriate forms, proposed six points of resistance to modernism, in his essay entitled "Towards a Critical Regionalism: Six points of an Architecture of Resistance" (1983). He argues for a postmodern, rational approach to architecture, stating that modern architecture manipulates the consumer into perceiving architecture as fashion, negating local identity and expression (Frampton, 1983: 17). He is not, however urging the embrace of local architecture, nor is he opposed to modernism. Instead he aims to establish "*an alternative theoretical position with which to continue the critical practise of architecture...able to build on the liberative and poetic legacy of the pre-war Modern Movement*" (Nesbitt, 1996: 469). The six points of resistance are:

- Culture and Civilization
- The Rise and Fall of the Avant-Garde
- Critical Regionalism and World Culture
- Culture Versus Nature: Topography, Context, Climate, Light and Tectonic Form
- The Visual Versus the Tactile

(Frampton, 1983: 18)

### **Culture and Civilization**

Modern buildings are now being controlled and universally conditioned by the optimisation of technology, preventing the creation of locally appropriate urban form. Frampton (1983) argues that restrictions imposed by the automotive industry and the volatile play of land speculation limit the scope of urban designs so dramatically that they end up being a manipulation of elements predetermined by the imperatives of production, or that which modern development requires for effective marketing or social control. The practise of architecture ends up being one that is high tech- stretching the limits of technology, maximising available commercial area and one that uses the 'compensatory facade' to cover up the effects of globalization (Frampton, 1983: 17). Frampton states that the city fabrics of the 21st century have become dominated by the freestanding high-rise and the serpentine freeway. Hannah Arendt agrees by saying that today's civilization is obsessed with the continuous chain of 'means and ends', commercial gains and the 'in order to' has become the content of the 'for the sake of', arguing that utility established as meaning creates meaningless (Frampton, 1983: 17).

### **The Rise and Fall of the Avant-Garde**

The modernisation of both society and architecture, and the emergence of the avant-garde are, according to Frampton, inseparable. Over the past century-and-a-half, avant-garde has assumed a variety of different roles, at times facilitating in the process of modernism, and also being strongly opposed to the positivism of bourgeois culture (Frampton, 1983: 18). Avant-garde architecture can be seen to have, by and large, played a positive role with regard to the progression of the Enlightenment. In the eighteenth century it served as both a symbol and an instrument for the propagation of universal civilization, while in the nineteenth century it assumed an adversary stance to both industrial processes and Neoclassical form. Through various periods including Futurism, Purism, Neoplasticism and Constructivism, the failures of avant-garde can be accounted for by its promotional attitude of a universal civilization through its liberal nature (Mthethwa, 2011: 70).

### **Critical Regionalism and World Culture**

Frampton (1983) argues that the only way architecture can be sustained as a critical practise today is if it assumes an *arriere-garde* position, distancing itself equally from the reactionary, unrealistic need to architrionic preindustrial forms, and moving itself away from the myth of

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Enlightenment. For this to occur, critical regionalism has to abandon the optimization of advanced technology as well as the tendency to fall back onto nostalgic historicism (Frampton, 1983: 20). Frampton states boldly that only an *arriere-garde* approach has the capacity to cultivate a resistant, identity-giving culture while at the same time having a discreet recourse to universal technique.

Frampton argues that the case may be made that Critical Regionalism, as a cultural strategy, is as much a bearer of world culture as it is a vehicle for universal civilization. He continues that we have to regard regional culture not as something given, but rather as something which has to be self-consciously cultivated (Frampton, 1980: 314). Ricour (1961) suggests that sustaining any kind of authentic culture will depend on our capacity to generate vital forms of regional culture while appropriating modern influences at both a cultural and civilization level.

### The Resistance of Place Form

If any central principle of Critical Regionalism can be isolated, then it is surely its commitment to 'place' rather than 'space' (Frampton, 1996: 480). The Megalopolis, as first defined by Jean Gottman in 1957, when describing the huge metropolitan area along the Atlantic seaboard of USA, continues to extend throughout the developed world to such an extent, Frampton argues, that only cities laid out before the turn of the nineteenth century can maintain defined urban forms. (Frampton, 1983: 24)



Figure 2.5- This astronaut photograph includes every metropolitan area in the Atlantic Seaboard except for Boston (located off the image to the northeast). This night image highlights the position and extent of each metropolitan area through urban lighting patterns. The establishment and growth of the metropolis was facilitated by transportation networks—railroads, highways, and air travel routes—for the transfer of goods, materials, and population between the cities.. (www.flickr.com)

Frampton (1983) states scathingly that the last quarter of a century has seen the so-called field of urban design degenerate into a theoretical subject whose discourse bears little relation to the processal realities of modern development. Frampton uses the rebuilding of Rotterdam after World War II as a case in study, stating that it reflects the current tendency to reduce planning to little more than an allocation of land use and the logistics of distribution.

Martin Heidegger, in his 1954 essay "Building, Dwelling, Thinking", provides a critical vantage point for the universal phenomenon of placelessness. Heidegger argues that the essence of a space/place depends upon the concrete, clearly defined nature of its boundary, *"a boundary is not that at which something that just stops, but , as the Greeks recognised, the boundary is that from which something begins its presencing."* (Heidegger, 1954: 154)

### **Climate versus nature: Topography, Context, Climate, Light and Tectonic Form**

Critical Regionalism, unlike the abstract traditions of modernism which encourages absolute placelessness, incorporates a direct dialectical relation with nature which opposes the bulldozing of irregular topography onto a flat site which as Frampton argues is *"...clearly a technocratic gesture which aspires to a condition of absolute placelessness."* (Frampton, 1983: 26). It advocates a balanced relationship between the site and the built form through terracing in a stepped formation towards cultivating the site. Frampton states that clearly this act brings one close to creating a sense of place, arguing that the specific culture of the region - that is to say, its history both in a geological and cultural sense - becomes inscribed in the form and realization of the work (Frampton, 1983: 26).

Frampton (1983) continues that what is evident in the case of topography can be claimed for the contingencies of climate and qualities of local light. He says that fenestrations, in the case of light control, have the innate ability to inscribe architecture with the character of the region, expressing the place in which the building is situated. A constant regional appropriateness arises directly from the fact that certain climates the glazing is advanced, while in others it is recessed. the way in which the openings provide for appropriate light and ventilation constitutes an unsentimental way of reflecting the nature of local culture.

### **The Visual Versus The Tactile**

Frampton (1983) states that the tactile resilience of place-form and the capacity of the body to read the environment in a variety of ways other than just sight suggests a potential strategy for resisting the domination of universal technology. We find it necessary to remind ourselves

that the tactile is an important dimension in the perception of the built environment (Frampton, 1983: 28). He argues that we have a whole range of sensory perceptions that can be utilized in experiencing the built environment including the intensity of light, darkness, heat and cold; the feeling of humidity; the aroma of material; the palpable presence of masonry etc. The liberative importance of the tactile resides in the fact that it can only be made out in terms of experience itself. It cannot be reduced to mere information (Frampton, 1983: 26). In this way Frampton states, "*Critical Regionalism seeks to complement our normative visual experience by readdressing the tactile range of human perceptions. In so doing, it endeavours to balance the priority accorded to the image and to counter the Western tendency to interpret the environment in exclusively perspectival terms.*" (Frampton, 1983: 28). He continues that the tactile opposes itself to the scenographic and the concealment of reality. The tactile and the tectonic jointly have the capacity to transcend the mere appearance of the technical in much the same way as the place-form has the potential to withstand the relentless onslaught of global modernization (Frampton, 1983: 26).

### **Finding Local Appropriateness Through Critical Regionalism**

Critical Regionalism aimed to create an architecture of place, in relation to which the individual does not feel alone or alien. It tried to create an architecture of belonging, of community (Tzonis and Lefaivre, 1992: 17). It uses the existing architectural attributes of a region to achieve regionalist aims, that is, to tag onto a building its place and social identity. Critical Regionalism did not result in an identifiable architectural style. This would have contradicted its very definition. Critical Regionalism sought local identity in that it aimed to express aspirations of liberated architectural forms from those imposed by political powers perceived to be foreign and illegitimate (Tzonis and Lefaivre, 1992: 18)

A strong development of Critical Regionalism, according to Tzonis and Lefaivre (1992), is the belief that the most deeply rooted way of expressing the identity of a place is resorting to local myth and iconology. This is the case in Raili and Reima Pietila's Tampere Main Library, Tampere, Finland with its bird (Metso-a large wood grouse) form (Tzonis and Lefaivre, 1992: 18). A prehistoric icon is married to contemporary technology and a contemporary, open way of life. Although the design strategy used makes use of the particular regions unique topographical characteristics, this is done by reincorporating it into the design of the project in a way that the building relates to the site (Tzonis and Lefaivre, 1992: 152)

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Figure 2.6- Exterior view of the libraries entrance. (Tzonis and Lefaivre, 1992: 153)

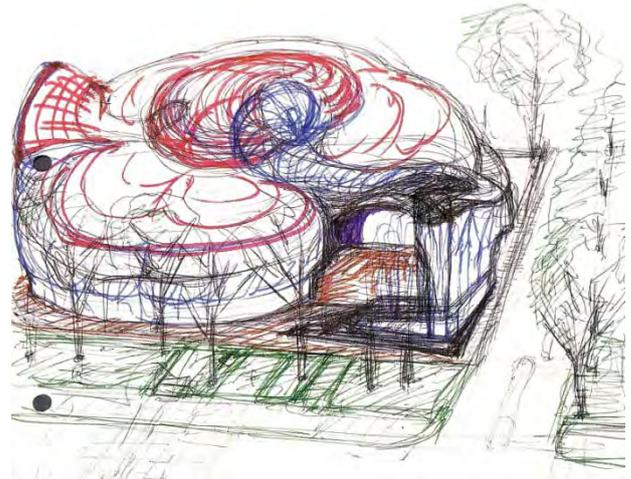


Figure 2.7- A conceptual sketch reflecting the bird form. (Tzonis and Lefaivre ,1992: 154)

Another approach to Critical Regionalism is to identify, isolate and schematise regional elements originating in local architecture, which are made new when used in a new context (Tzonis and Lefaivre, 1992: 19). Architect Giancarlo De Carlo, suggests that in order for this process to find its true meaning and reflect the true identity of the users and the place a transaction needs to occur. De Carlo argues that in order to identify the collective meaning of an architectural element, an interactive process with the local inhabitants needs to occur (Tzonis and Lefaivre, 1992: 19). He continues *"It is only in this way that the resulting information can be put to an effective, emancipatory use."* (Tzonis and Lefaivre, 1992: 19)

This interactive approach can be seen in De Carlo's Mazzorbo Housing Project, Venice, Italy. The site, on the island of Mazzorbo, a few minutes away from Venice itself, makes it immediately obvious that historical considerations, the 'gentle invasion' of new houses in the landscape charged with a cultural past, were of utmost importance (Tznois and Lefaivre, 1992: 198). Richard MacCormac in his inaugural address as RIBA's new president, on 2 July 1991, quotes De Carlo: *"To design in a historic place, one should first read all the layers of architectural strata and try to understand each of them, before superimposing a new one. This does not mean indulging in imitation, as this would be saying nothing about the present and creating confusion over the past. What is called for is the invention of new architectural images that are authentic, but rooted to the past."* (Tznois and Lefaivre, 1992: 198). Given the close proximity of Venice, and its strong architectural identity that it portrays, and the fact that most of the inhabitants of the new housing complex were moving from there, physical images and also past ways of living were deeply engraved on their minds. De Carlo acknowledged these contextual constraints. (Tznois and Lefaivre, 1992: 198)

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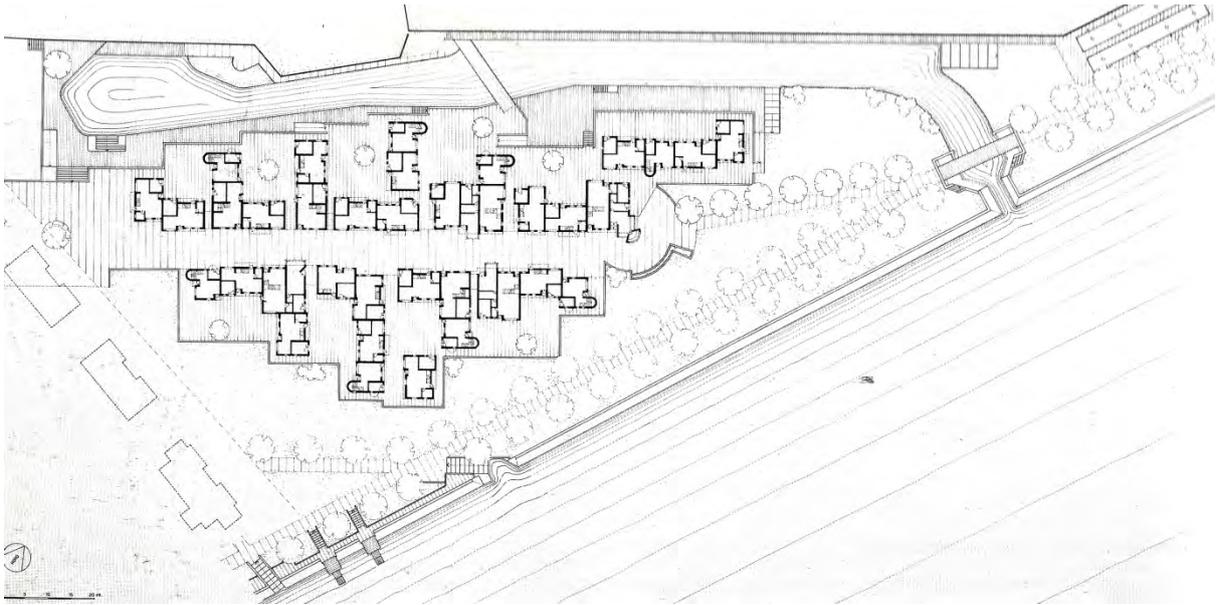


Figure 2.8- General Plan of the Mazzorbo housing project. (Tzonis and Lefaivre, 1992: 198)

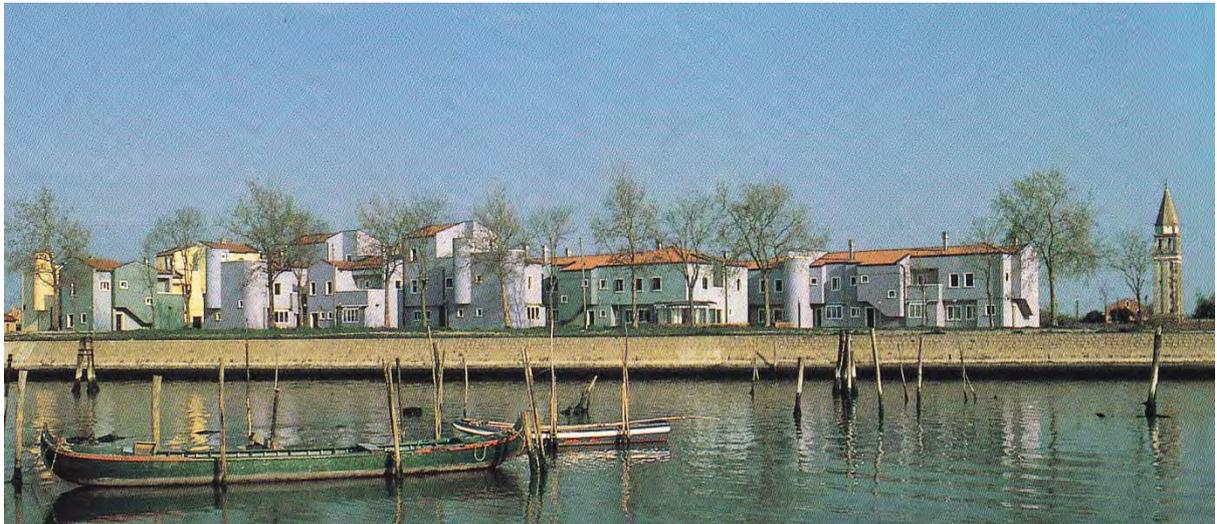


Figure 2.9- The houses viewed from the lagoon. The colours of the facade are derived from 'chromatic structures' that exist on Mazzorbo. The preservation of these contextual elements reveals emphasis on maintaining contact and community. (Tzonis and Lefaivre, 1992: 199)



Figure 2.10- The central spine between the housing rows. (Tzonis and Lefaivre, 1992: 200)

### **The Shortfalls of Critical Regionalism**

In its efforts to appeal to the wider public, Critical Regionalism suffered great pressure during the 1970's and 1980's. It risked reverting back to the earlier forms of regionalism which was seen as sentimental, scenographic and ethnocentric (Tzonis & Lefaivre, 1992: 19). There was an equal danger that it would turn into nothing more than an architecture of tourist commercialism. As a result, Critical Regionalism failed to effectively identify a genius loci, and to sustain the hostile conditions of the modern no-man's-land that exists on the edge of the post-industrial, post-urban landscape, conditions of a seemingly uncontrollable chaos of form, meaning, function and human ties (Tzonis & Lefaivre, 1992: 19). Critical Regionalism, as a result, has been eclipsed by more embracing approaches to identity formation and localness that seeks to establish an existential foothold (Norberg-Schultz, 1980: 5).

While advocates of Critical Regionalism create localness by employing the physical aspects of architecture, Christian Norberg-Schultz introduces his concept from a more psychological point of view. According to Norberg-Schultz, the relation of man to his surroundings is more than simply a matter of being able to orientate oneself to one's local surroundings, but it has to do with a much deeper process of identification, by which you enter into a relationship or become friends with your local environment. In turn, human identification with a place, assumes that places have character, that is, attributes that distinguish it from another place and which lend to a place its unique presence or genius loci (Abel, 2000: 143).

In his book "The Genius Loci: Towards a Phenomenology of Architecture" (1980), Norberg Schultz's approach to the concept of localness examines the relationship between man and the built environment. Schultz states that there are three ways in which man attempts to put into practise their understanding of nature:

- Visualising- An understanding of nature is expressed through the design and construction of buildings
- Complementing- Understanding nature by adding what is lacking
- Symbolising- Translating an understanding of nature into another form or medium

(Norberg-Schultz, 1980)

All these processes of understanding require some form of local knowledge, and hence localness. Section 2.3.4 will look at public architecture and its ability to represent national and political identity, and in turn create a sense of place or genius loci.

### **2.3.4 Identity in Public Architecture**

This section will focus on the expression of identity in public architecture. A study by Lawrence Vale titled "Architecture, Power and National Identity" (1992) covers this development. The section seeks to analyse Vale's approach to the concept of identity through studies of public architecture and how power and politics play a critical role in this regard. Vale's work is important as it is a further development of identity issues in the built environment as explored by Critical Regionalism. This is the most recent development to the concept of identity and the search for local appropriateness. Approaches to regionalism by Critical Regionalists, as discussed in section 2.3.3, employ specific geographical parameters such as the quality of light, climate, landscape features, culture and ecology in developing identity of a place. This is contrasted to architects who practise regionalism with the aim of creating nationhood, which is guided by national boundaries (Mthethwa, 2011: 129).

Identity conceptions moulded by national buildings is an attempt by architects to physically articulate national characteristics (Vale, 1992: 3). Ruling classes around the world have utilized architecture to achieve national unity. This manipulation of the built environment has proved to be an effective method in creating a sense of national identity and unity, as can be seen in the United States of America and its Capitol Hill (Mthethwa, 2011: 129). It could be argued therefore that the identity of a specific group, namely the public transport industry, can be manipulated, or redefined through architectural expression.

Clifford Geertz (1973), cited in Vale (1992: 47), defines the link between national identity and architecture as *"The images, metaphors, and rhetorical turns from which national ideologies are built are essentially devices, cultural devices designed to render one or another aspect of the broad process of collective self redefinition explicit, to cast essential pride or epochalist hope into specific forms, where more than dimly felt, they can be described, developed, celebrated and used."* The task of creating national identity is a conscious effort by government leaders and architects, achieved through the manipulation of the built environment.

Vale (1992: 51) continues that national identity may also be promoted through attempts to demonstrate architectural evidence of cultural uniqueness, while identity - being a variable that overlaps with time and is highly situation based - opposes this promotion. In many cases this has resulted in national identity being used as a power tool, even though it is artificial. This is evident where the national identity communicated through the production of

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parliament buildings usually highlights the identity and interests of a dominant cultural group within society (Vale: 1992: 49). However, this distinct culture is almost never representative of the country as a whole, as new states are rarely, if ever, culturally homogenous, and national identity is rarely directed at the liberation of a single, clearly bounded cultural group to which all citizens claim membership (Vale: 1992: 48).

It has been argued in the book "Opportunities for Relevance" by Brian Kearney and Sabine Marschall (2000), that in order to create an architectural identity, which is reflective of all cultures, one must resort to some kind of abstraction. Yet if a building is too far abstracted from any reference point, it becomes culturally neutral, and may be resisted, resented, or even ignored. According to Marschall and Kearney (2000: 154), "*...the challenge is to abstract in a way that contributes to the existing nation that builds upon what is there without exacerbating interethnic tensions. The task is to develop a rich ambiguity, so that the building neither seems to serve one function nor seems so neutral that it may exist anywhere.*" (Marschall & Kearney, 2000: 154). In essence the architecture can only be accepted and appreciated by society if its identity is not relegated to the background. Successful architecture is that which relates to the context of that society and expresses the identity of all who constitute it (Davids, 2007: 34). This statement is extremely relevant when trying to express the identity of the public transport industry. This industry is formed by a number of different groups, all with their own individual identity, culture and ethnicity. There is a danger of, in an attempt not to design for either one of these groups specifically, to design for none of them at all. Rather a balance is required, a kind of abstraction, as previously stated.

What is significant about the debate regarding architectural identity in Kearney and Marschall's book, is the awareness of the critical issues of architecture's power to represent, project a specific image, and be associated with a particular culture or group. Given the sensitivity of the issues of racial or ethnic differentiation in the light of South Africa's recent past, it is important to rethink and critically examine this issue, not only with respect to the articulation of the facade but starting with the typology and basic patterns of space making (Marschall & Kearney, 2000: 154).

## 2.4 CONCLUSION

This chapter set out to trace the historical developments regarding the concept of identity, through the work of Stuart Hall and Paul Taylor, and how this was related to and reflected in architectural discourse. It was discovered that the path of development regarding the concept of identity, from the fixed, the flexible and the fluid can be seen and analysed in a similar manner in architecture, by means of a method used by Majhamahle Mthethwa, through the analysis of cultural connectivity. The primary focus of these theories is considered to be creating architecture with a regional and local appropriateness- architecture that represents the identity of the community and user groups for which they are designing for.

The initial discussion looked at identity being fixed, through the use of local architecture, as discussed in the work of Paul Oliver, which used rationality and formality as a basis for their designs. Local architecture, became the precedent upon which architects based their designs in seeking local or regional appropriateness and identity. Place-centred identity construction was first explored here.

This approach to architecture related to cultural connectivity, however, was criticized by advocates of Critical Regionalism such as Kenneth Frampton and Alexander Tzonis and Liane Lefaivre, who claimed that architects 'abused' culture and that their work was 'hypnotic' (Mthethwa, 2011: 154). Architects such as Correa and Fathy were accused of only looking at local traditions, and did not consider economic and political factors. Frampton felt that they failed to address modern technology and materials available. Frampton still addressed issues of local appropriateness, but went beyond that by proposing a design approach based on structural elements of the local context, without becoming entangled with local architecture.

However Critical Regionalism also had its shortfalls, as discussed by Tzonis and Lefaivre. It failed to effectively create a *genius loci*. To investigate the question of *genius loci*, with respect to identity and local appropriateness, public architecture and its ability to reflect national identity was looked at through the work of Lawrence Vale. It was deduced that it can be extremely difficult to design a building that represents a nation, as people and groups are not homogenous and all perceive the built environment differently. This perception could lead to rejection or misuse of a particular building. As a result a building should be abstracted, but not too far as to become culturally neutral. It is a fine balance that architects have to deal with.

## **CHAPTER 3: TRANSPORT IN A CONTEMPORARY CONTEXT**

### **3.1 INTRODUCTION**

This chapter aims to address infinite number of issues surrounding transport in the contemporary context and how sustainable measures can aid in alleviating some of these problems. The chapter addresses both the global and local context in the 21st Century. The introduction of the intermodal facility and its benefits is covered as well as the issues surrounding automobile domination and its possible alternatives. South Africa has various issues surrounding public transport, most of which stem from the structures of the apartheid regime. Investigating the public's perception of public transport, and why it is what it is will be addressed as well as the current situation of public transport facilities in South Africa. The local context will address the micro context of the eThekweni municipality and its surroundings.

### **3.2 TRANSPORT IN A GLOBAL CONTEXT**

#### **3.2.1 Introduction**

The urban environment offers an extremely complex setting for the development of any new project. This section addresses the range of issues that need to be dealt with when addressing transport. It will introduce the relationship between transport and the city, and the need to move towards a more sustainable approach to transport planning. This section will also address the nature of intermodal facilities and their inherent benefits to society and the environment.

#### **3.2.2 The Four Pillars of Sustainable Urban Transport**

The unsustainable nature of current urban transportation and land use is a major issue facing the world today. The pressures to develop sustainable transport systems is particularly high in urban areas. According to The World Bank (2002), 0.5 million people in developing countries die each year as a result of transport related air emissions, with a similar death toll from traffic accidents (The World Bank, 2002). The urban population in the developing world is close to 50% and growing rapidly, while in the developed world this mark is at 75% (Hall, 1998). These statistics reflect the importance of designing sustainable transportation systems in modern cities. Of particular issue is the rapid growth of sprawling, low-density suburbs where commuters, especially those travelling across town, rely largely on automobile

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use. Vehicle emissions, congestion and car dependency result in a reduced quality of life in many cities. It can be argued that denser urban forms are more efficient in terms of automobile use, energy use, atmospheric emissions, travel cost and use of land. On the other hand there is no evidence that current worldwide patterns of urban growth, characterized by low density sub-urban sprawl and auto dependency are sustainable in the long run.

According to Kennedy et al (2005: 393), the process of achieving more sustainable transportation requires the suitable establishment of four pillars:

- Effective governance of land use and transportation
- Fair, efficient and stable funding
- Strategic infrastructure investments
- Attention to neighbourhood design

(Kennedy et al, 2005: 393)

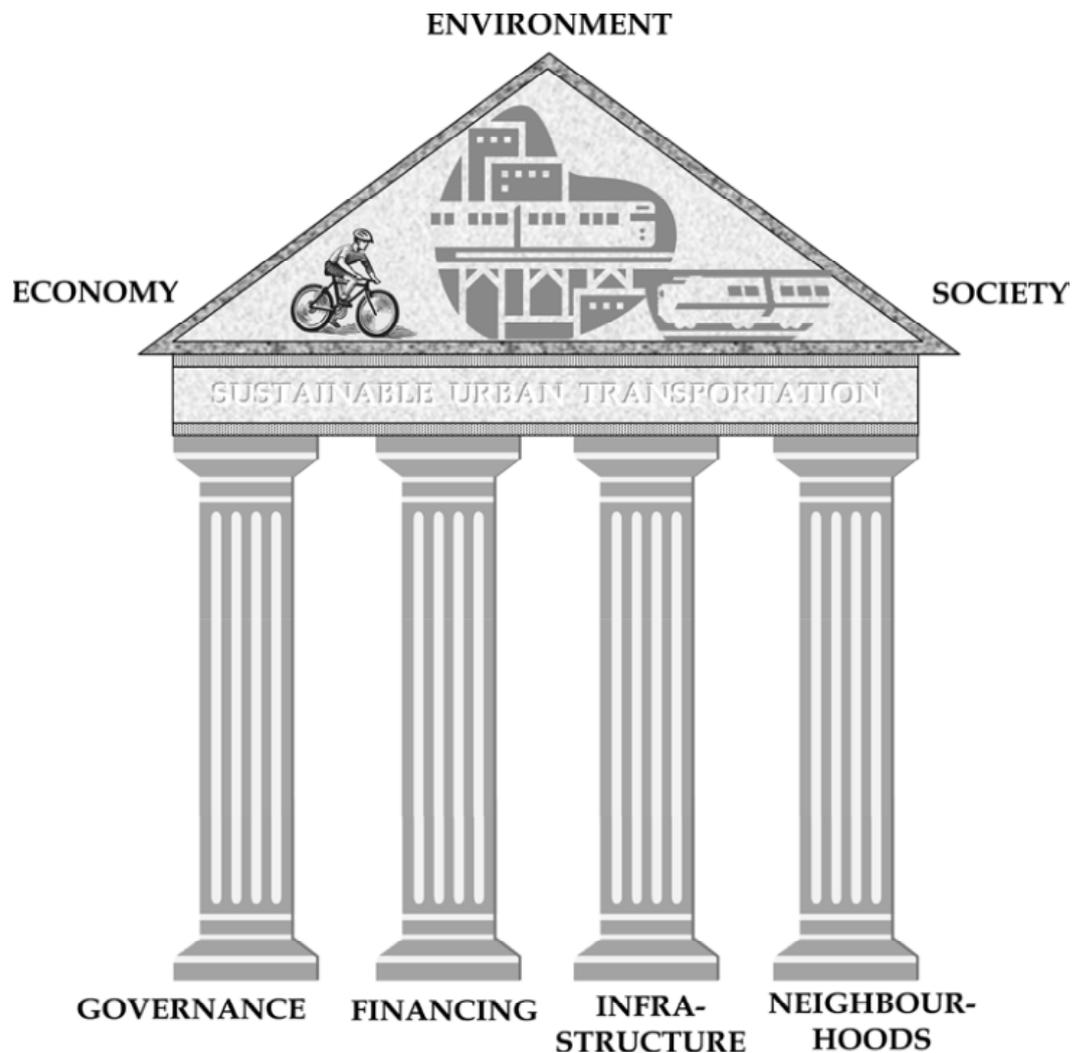


Figure 3.1- The Four Pillars of Sustainable Urban Transportation (Kennedy et al, 2005: 396)

In broad terms, movement to sustainable urban transportation involves the provision of accessibility and the generation of wealth by cost effective and equitable means, while safeguarding health and minimizing the consumption of natural capital and emissions of pollutants (Kennedy et al, 2005: 393). However, many barriers in terms of implementing these sustainable measures exist. These include attitudes towards vehicle ownership, risks in developing brown-field sites and inappropriate pricing and/or funding of transportation (Bannister, 1998: 65).

### **Establish and Effective Body for Integrated Land-use Transportation Planning**

The first pillar addresses the matter of governance. The urban planner or transportation official understanding the need for sustainable transportation and wishing to do something about addressing the issues, may likely not be able to do so. In most cases, such authorities do not have the mandate, responsibility, power or support to make decisions that are consistent with sustainable development (Kennedy et al, 2005: 395). One of the most common problems is the division in responsibility between transportation authorities and land-use planners. This section stresses the need for an integrated transport land-use planning process.

As previously mentioned, the only way to understand the interactions within cities and to address the range of issues is through an integrated approach to land-use planning and transportation. Curitiba, Zurich and Singapore have been recognized as cities achieving this (The World Bank, 2002). Kennedy et al (2005) earmark four key characteristics of an ideal body for effective land-use transportation planning:

- Spatial representation: Achieving a balanced representation of local community interests and the urban region interests as a whole
- Structure: A higher degree of control needs to be put into place over processes and personnel. A hierarchy is the ideal structure to implement sustainable development. Netherlands utilizes this hierarchical system to great effect
- Democracy: Establishing an appropriate balance in authority between professionals and government. Public participation is also of utmost importance. Any serious move towards sustainability requires a shift in attitudes, perception and lifestyles of a community
- Market philosophy: Strong regulation of transportation is necessary for sustainable urban development (Kennedy et al, 2005: 398-401).

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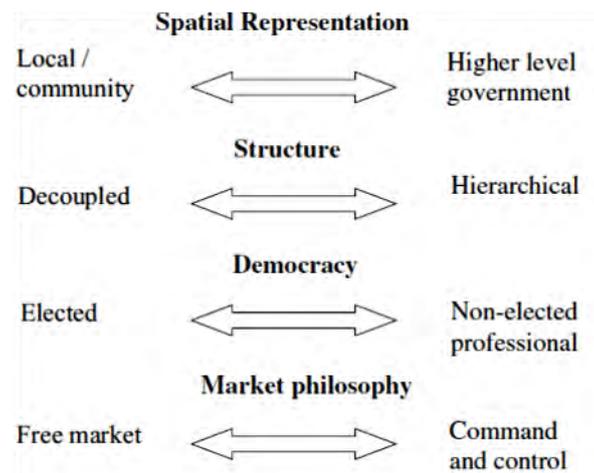


Figure 3.2- Trade-offs in the establishment of effective regional governance for regional land-use and transportation planning (Kennedy et al, 2005: 398)

**Create a Fair, Efficient and Stable Funding Mechanism**

Developing an efficient, long term finance plan for transportation system is necessary for the well being of cities. This can be through investment for new infrastructure or for the long term operation and maintenance of existing systems (Kennedy et al, 2005: 401). The World Bank (2002) notes three complications that typically distort effective financing and pricing of urban transportation:

- Responsibility for infrastructure is separated from service provision
  - Responsibility for interacting modes of transport is dispersed
  - Infrastructure financing is separated from infrastructure pricing
- ( The World Bank, 2002)

The ability to develop efficient and stable funding for transportation is deeply rooted in the establishment of an appropriate governing structure, as discussed above.

**Table 3. Potential sources of funding for urban transportation systems**

	Non-vehicle related	Vehicle-related
Non-location-related	General tax base	Fuel taxes
	Local transportation levy	Vehicle license fees
		New vehicle or vehicle parts sales taxes
		Vehicle use fees
Location-related		Emissions fees
	Development fees	Road tolls
	Transit impact fees	Congestion pricing
	Right of way fees	Parking fees
	Leverage real-estate assets	Transit user fees

Figure 3.3- Potential sources of funding for urban transportation systems. (Kennedy et al, 2005: 402)

### **Make Strategic Investments in Major Infrastructure**

Given how unsustainable current transport systems are globally, it is inevitable that major infrastructural investments are required to fix this. Authors such as Gillen: 1996 and Reitveld and Bruinsman: 1998, argue that it is practical to make more effective use of current infrastructure rather than building new. This approach seems reasonable if the continuation of the status quo is the aim. However, when taking into consideration that in many urban areas 75% of trips are made by automobile, this is inconsistent with global sustainability (Kennedy et al, 2005: 395). Whether the solution is greater use of more sustainable modes of transport or a change in automobile technology, each involves long-term infrastructure investments.

Investing in major infrastructure alone, however, is likely to be ineffective unless accompanied by actions at the local scale (Kennedy et al, 2005: 395). There are many local policies and small scale investments that might improve the attractiveness of walking, cycling and transit use. These local actions may potentially boost commuter numbers on more environmentally sustainable transportation modes, ensuring that major investments are cost effective. This attention to detail at the community scale, while concurrently planning major transportation corridors, lies at the heart of successful integrated land-use transportation planning (Kennedy et al, 2005: 395).

If the essence of sustainable transportation is to reduce the number of cars, while improving mobility and accessibility, then it is imperative to have an extensive and well integrated public transport system that most importantly has adequate capacity and competitive levels of services (Kennedy et al, 2005: 406). Kennedy argues that the gap between medium capacity, low performance surface transit and high capacity, high performance rapid transit. He continues that this can be done through the integration of LRT-Light Rail Transit, and BRT-Bus Rapid Transit (Kennedy et al, 2005: 407). Examples of both modes of travel can be seen in Johannesburg in the form of the Gautrain and Rea Vaya services.

### **Support Investments Through Local Design**

Until new generation of sustainable automobiles have been developed, investment in public transport may be the most viable means of making urban transport in general more sustainable (Kennedy et al, 2005: 407). However, you cannot rely solely on this. Macro land-use and neighbourhood designs need to be supportive of and compatible with these investments. People need to be able to get to major transit routes from their houses, jobs and

other activities. Convenient connectivity will attract users to these facilities.

Large amounts of recent literature has focussed on the need to return to neo-traditional neighbourhoods, which attempt to create high pedestrian access through connected grid street patterns, mixed land use and narrower streets (Boarnet & Crane, 2001). The critical issue, however, is whether designing pedestrian friendly neighbourhoods, encourages sustainable travel. A study by Cervero and Radisch (1996), found residents of a traditional neighbourhood had significantly greater use of non-auto modes of transport including walking and cycling (Kennedy et al, 2005: 408). Neighbourhoods cannot be looked at in isolation though. They have to be analysed in relation to the macro context. Major transit infrastructures need to be in a place where pedestrian friendly neighbourhoods can feed (Kennedy et al, 2005: 409).

Micro neighbourhood design of street layouts and pedestrian connections to transit should be informed by planning of ‘macro urban form’ including zoning and broad regional design concepts etc. (Kennedy et al, 2005: 409). Unless neighbourhoods provide attractive access to major transit facilities, commuter numbers will likely be inadequate and investments in the major systems will be financially unsustainable. Thus, the discussion swings back to the first pillar. It is only through the establishment of effective regional governance of land use and transportation that the essential connections between micro neighbourhood design and macro urban form can be made.

**Table 5. Comparative characteristics of conventional and traditional neighbourhoods (adapted from McNally and Kulkarni, 1997)**

	Contemporary suburban design	Traditional neighbourhood design
<b>Network</b>	Circuitous, meandering streets Hierarchical street pattern (highways, arterials, collectors) Limited access points to the neighbourhood Wide streets without street parking Predominantly auto based	Interconnected, grid-like street patterns Separate paths (networks) for pedestrians and bicycles Narrow streets On-street parking Green spaces and tree lining Access points to the neighbourhoods Many modes successful
<b>Land use</b>	Segregated, clustered land uses Access to a limited number of ‘highly desirable’ land uses Low residential densities Large home lots	Mixed land uses Close proximity of land uses High residential densities Small home lots Access to parks, recreation and distinct neighbourhood ‘centres’
<b>Design</b>	Missing sidewalks Less shaded sidewalks Homogeneous housing Dominating garages and driveways	Shaded sidewalks Variation in housing design and size Shallow setbacks Front porches Detached garages

Figure 3.4- Conventional and traditional neighbourhood comparisons. (Kennedy et al, 2005: 408)

### 3.2.3 The Age of the Automobile and Its Alternatives

In their book, "Travel by Design: The Influence of Urban Form on Travel" (2001), Boarnet and Crane pose the rhetorical question: What is bad about cars? they provide the following answer: "The problem with cars is not that they are bad as such, but that the car brings with it undesirable side effects for which the market does not provide compensation. These externalities include air quality problems, traffic congestion and undesirable impacts on neighbourhood quality of life." (Boarnet & Crane, 2001)

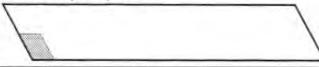
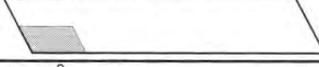
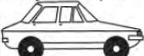
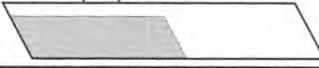
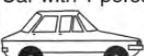
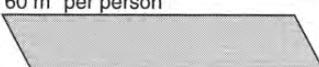
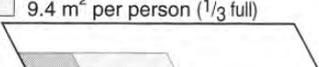
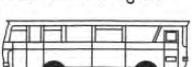
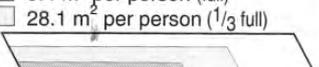
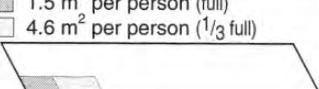
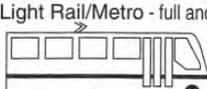
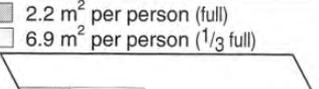
Transport Mode	Speed	Space required per person
 Pedestrian		0.8 m <sup>2</sup> per person 
 Cyclist		3 m <sup>2</sup> per person 
 Fully Occupied Car		6.2 m <sup>2</sup> per person 
 Fully Occupied Car		18.7 m <sup>2</sup> per person 
 Car with 1 person		20 m <sup>2</sup> per person 
 Car with 1 person		60 m <sup>2</sup> per person 
 Bus - full and 1/3 full		<ul style="list-style-type: none"> <li> 3.1 m<sup>2</sup> per person (full)</li> <li> 9.4 m<sup>2</sup> per person (1/3 full)</li> </ul> 
 Bus - full and 1/3 full		<ul style="list-style-type: none"> <li> 9.4 m<sup>2</sup> per person (full)</li> <li> 28.1 m<sup>2</sup> per person (1/3 full)</li> </ul> 
 Light Rail/Metro - full and 1/3 full		<ul style="list-style-type: none"> <li> 1.5 m<sup>2</sup> per person (full)</li> <li> 4.6 m<sup>2</sup> per person (1/3 full)</li> </ul> 
 Light Rail/Metro - full and 1/3 full		<ul style="list-style-type: none"> <li> 2.2 m<sup>2</sup> per person (full)</li> <li> 6.9 m<sup>2</sup> per person (1/3 full)</li> </ul> 

Figure 3.5- Consumption of space by different modes of transport. (Tolley & Turton, 1995: 184)

In many cities suffering from urban sprawl and the above mentioned problems, the car as a transport means cannot be the perfect solution, however, on the contrary it leads to a dead-end, especially considering that the urbanisation process will continue in the foreseeable future (Deutsche Bank, 2007). The development away from the current problematic situation the world finds itself in, and towards the promotion of public transport and non-motorised travel has therefore come to the fore.

Although the car is generally viewed in a negative light with regard to sustainability in transport, one must view the argument from the car user's perspective too. As car

ownership has increased, public transport patronage and availability has declined. If increasing dependence on the car as the primary means of transport is to be slowed, there needs to be substantial investment in public transport, as discussed in section 3.2.2. Nowhere

is this more important than in urban areas. Car owners need to be persuaded to use their vehicles less. This could be done through the use of congestion charging. It can be implemented in a number of ways, such as vehicle occupancy charges to zoning systems seen in London. However, Banister & Button (1993) argue that it is inconsistent to talk about restricting car use when often the only alternative transport available is an unreliable and dirty bus or train (Banister & Button, 1993: 154).

People have a growing expectation regarding quality and comfort. Public transport systems need to be improved to provide a higher level of customer care and satisfaction. This can be seen in both the Gautrain Initiative and the Rea Vaya BRT System in Johannesburg. On top of that public transport needs to take people where they want to go when they want to go. They should travel in comfort and at a price that they can afford (Banister & Button, 1993: 154).

Banister & Button (1993) continue that the automobile needs to be integrated into the public transport system, rather than excluded. The aim is to reduce automobile travel not get rid of it completely. The car provides a vital link between the home and the bus stop or railway station- a link that most public transport systems cannot offer (Banister & Button, 1993: 155). The provision of park-and-ride facilities will encourage greater public transport patronage and integrate the private and public sectors. Park-and-ride facilities are not the solution to congestion in every city, but where it is well integrated and operated, it will contribute to a significant switch from the car to public transport.

The alternative to the automobile is public transport which includes busses, rail-based systems, taxi's and cabs. However the importance of non-motorised transport including walking and cycling are the most sustainable, and could be argued in our modern age, the most important forms of urban travel.

The physical rebuilding of Western cities around for the private car was a process fostered by deliberate policy making, which was compounded by flawed assumptions made in transport planning (Cox, 2010: 117). Cities around the world were reshaped to accommodate the radical new demands of mass motorization. The car was structurally encouraged, being seen as a step towards modernisation, and the provision of support facilities including road building, traffic police and specialized accident response (Ullrich, 1990: 117).

Moves to pedestrianize European cities during the 1970's was the first reaction to the impact

of the automobile. Zoning for pedestrians also recognized that pedestrians and motorised traffic to not mix well, particularly in confined urban centres where space is at a premium (Cox, 2010: 118). One of the biggest issues regarding motor vehicles was the huge demand for parking spaces, which encroached onto walkways, making walking far less attractive (Tolley & Turton, 1995: 174). While BRT, busses, trains and trams can provide sustainable modes of mass transit, cycling and walking provide similar potential for individual urban mobility.

Walking, according to Tolley and Turton (1995) is the most important form of urban transport. In developing countries walking dominates urban transport for the poor, who generally walk most often and furthest. Most walkers do not have a modal choice, for their poverty denies them the opportunity to use anything else, or they have to walk to get to a significant transport route (Tolley & Turton, 1995: 174). Planning must recognise that walkers are still travellers in the urban system, however it is frequently overlooked. Frequently the impact of motorization on pedestrians and other non-motorized road users is to marginalize them (Cox, 2010: 119). The multi-use of streets are sacrificed to increase traffic flows, making the roads more efficient and the walkways less efficient.

The arrival of the car as the dominant mode of transport produces safety fears around public places, meaning people are less likely to walk, especially at night, as a result of the drop in non-motorized pedestrians. Children's mobility is also constrained to the boundaries of their homes, as the street outside is perceived to be dangerous as it is a place for motor vehicle traffic.

Alongside the critiques of the problems cause by the dominant car environment has come renewed focus on the role of cycling, and its great potential for urban mobility. One of the most notable factors increasing policies to support and encourage cycling is the realization of a close correlation between high levels of cycling and the quality of urban life (Cox, 2010, 122). The most desirable towns around Europe all have high levels of bicycle use.

David Banister in his book "Unsustainable Transport: City Transport in the New Century" (2005), outlines seven basic objectives for sustainable mobility:

- Reducing the need to travel
- Reducing absolute levels of car use and road freight
- Promoting energy efficient modes

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- Reducing noise and vehicle emissions
- Encouraging efficient use of vehicle stock
- Improving safety of pedestrians and all road users
- Improving the attractiveness of cities for residents

(Banister, 2005)

Of these seven objectives set out by Banister, increased cycle use is a potentially significant contributor to all but the first (Cox, 2010: 122). The success of public bicycle hire schemes in European cities has demonstrated the potential of the bicycle not only to fulfil the objectives set out by Banister above, but also the potential of the bicycle being a successful form of public transport. The most frequent mode of operation is operated using hire stations placed strategically around the city. Bikes can be collected from these stations and deposited at similar stations around the city. Complementary to busses, BRT, taxi and rail systems, public bicycle hire can provide transport links between these various modes of transport, and to the final destination.



Figure 3.6- Boris's Bikes in London - A successful bicycle hire service set up by mayor Boris Johnson . (transitiondeal.blogspot.com)



Figure 3.7- A cash free system allows for users to access the bikes safely and easily. (transitiondeal.blogspot.com)

### 3.2.4 Why an Intermodal Facility?

If the world is to move away from the age of the car, then attractive alternatives are required. Cycling and walking may be appropriate for shorter travel distances, but transferring longer trips requires a good quality public transport system is in place that ensures that the city can function efficiently. According to Tolley & Turton (1995) this means that:

- Fares need to be low enough for poor people to be able to afford them
- There must be sufficient vehicles for a frequent service to be run throughout the day,

both during peak and off peak times

- Routes must reflect the dominant desire lines of the travelling public and there should be extensive spatial coverage of the city so that no one is very far from a public transport stop
- Speeds of busses need to be raised relative to cars by freeing them from congestion, through designated bus routes/lanes
- It is not enough to provide public transport: it also has to be co-ordinated. Multimodal tickets may be one essential ingredient of a functional urban transport system, but the key item is the integration of services by the provision of connection between modes (Tolley & Turton, 1995: 217)

In an ideal transport network interchanging is avoided, but this is difficult in large cities where passengers invariably use more than one mode of transport to get to their final destination. Tolley and Turton's final point regarding an effective, good quality public transport system, points towards the integration of services by the provision of connection between modes, which can be achieved via transport interchanges. Transport terminals and interchanges are often neglected in debates surrounding the influence that transport infrastructure may exert over economic location and development (Button, 1995: 241). However, in practise, economic activity tends to thrive around interchanges as the transport interchange acts as a catalyst for development and economic injection to the area. Button argues that there is continual competition to attract such facilities to specific areas in a belief that positive economic effects will follow (Button, 1995: 241).

An intermodal facility offers the capacity to link various modes of both public and private transport (see section 3.2.3). This allows users to choose the most efficient or convenient mode of travel to get to their final destination. It also allows for a seamless transition between modes, preventing the need to walk excessive distances to transition from one mode to another. While intermodal facilities offer a progressive option to existing transport facilities, they should not only be considered in the context of motorized travel. Section 3.2.3 stressed the importance of including the extensive use of bicycles and the walking pedestrians to work towards a more sustainable transport plan. Encouraging these types of transport by providing facilities for them within a transport interchange is of utmost importance.

An intermodal facility also allows various modes of transport to support one another with regards to flexibility and economic viability. Individual modes of transport offer a limited

range of functions. While rail travel may offer competitive rates, it is limited in terms of flexibility with regard to routes and schedules. On the other hand transport modes such as the taxi cab are often significantly more expensive as they offer more flexibility. Tolley (2003) argues that the mode of transport chosen is often not the ideal solution for each commuter's particular scenario, but is selected purely because they are limited in choice as a result of their income bracket (Tolley, 2003: 173). These issues can be alleviated via a transport interchange where multimodal tickets are offered, which can create incentives via reduced fares if you for example catch the bus within an hour of catching the train. A fantastic example of this can be seen in the Gautrain Initiative. Bus fares are reduced by more than 70% if it is caught within sixty minutes of catching the train. This can only work, however, if the transfer between the various modes of transport is made easy.

### **3.2.5 A Good Transport Node**

With all countries exploring sustainability issues, transport projects are in a unique position. They are generally seen as efficient users of energy, producing little or no pollution at the point of use.

One of the key challenges is to achieve a major modal shift in transport preference. Intermodal journeys therefore need to become more attractive. Transportation hubs must promote effective interchange between different transport modes.

By default, some modes of transport have become intermodal over time. The airport is a classic example. Transport hubs now offer combinations of connections between bus, mass rapid transit, air, car (park and ride) and rail (both high speed and classic).

Key factors influencing effectiveness of transport interchanges:

- Ability to change between different modes
- Logistical and operational factors
- How well synchronized are services between different modes?
- Physiological factors, notably fear of crime
- Physical design and layout, e.g. way finding and crowding management
- Physical location of interchange
- Ease of access to/from interchange
- Availability of parking

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- Economic and social factors, e.g. cost of travel
- Amenities and journey experience, e.g. business lounges
- Commercial services at the interchange.

Effective transport and urban design solutions are central elements of sustainable developments. Successful interchanges will:

- Promote accessibility to a variety of integrated travel modes
- Optimize traffic and transport efficiency
- Reduce congestion and environmental impacts
- Function as an integral element of urban design and public realm
- Sometimes act as the brand for the scheme
- Achieve cost-effectiveness in construction and operation
- Facilitate commercial development of the site and surrounding area.

In conclusion all good interchanges will be simple, safe, comfortable and uncrowded, providing the passenger with short walking distances and waiting times, clear information display and an attractive environment (Tolley & Turton, 1995: 217).

### 3.3 TRANSPORT IN A LOCAL CONTEXT

#### 3.3.1 Introduction

In developing countries such as South Africa public transport is characterized by a number of peculiarities that are generally absent when compared to other public transport systems found around the world. It is most certainly a unique context that South Africans find themselves with various characteristics including most obviously the low capacity, sixteen seater mini-bus taxi. Associated with this are issues of vehicle maintenance, inter-association rivalry, industrial sustainability and the fleet age profile (Walters, 2008: 1).

Public transport in developing countries is also generally characterized by a lack of adequate financial resources to fund transport development. The demands of affordable housing, running water in outer lying areas, education and health services are seen as far more pressing matters, which means that the funding for public transport development and support is limited. Prof. Jackie Walters of the Department of Transport and Supply Chain Management in his document titled "Overview of Public Transport Policy developments in South Africa" (2008) states that these financial constraints give rise to issues such as a lack of timeous capital investments to replace rolling stock, lack of integrated transport planning and absence of a firm commitment to public transport (Walters, 2008: 1).

South Africa is in the process of tackling these issues and there is a realization that public transport has a role in enhancing urban mobility, reducing road congestion, decreasing the impact on the environment and better serving the economy. With the country experiencing sustained economic growth over the last fifteen years, one of the side effects is the growth in car ownership resulting in increased road congestion, which can be seen especially in Gauteng where a forty kilometre trip from Johannesburg to Pretoria can take up to two hours or more (Walters, 2008: 2).

Based on the White Paper issued by the government in 1996, and the twenty year Moving South Africa Strategy, significant interventions have taken place and are being accelerated to improve public transport in the country. These interventions, including the effects of apartheid planning on public transport will be addressed in this section. A cultural study of eThekweni and public transport proposals for the municipality will also be analyzed to create a micro context.

### **3.3.2 Mobility and the Legacy of Apartheid**

Apartheid was a system of legal racial segregation enforced by the ruling National Party in South Africa between 1948 and 1994, where the rights of the majority non-white inhabitants were curtailed and white supremacy and Afrikaner minority rule was maintained (Freuh, 2003: 5). The government segregated education, healthcare and other public services including public transport. New legislation classified inhabitants into four racial groups namely native, white, coloured and Asian. Residential areas were segregated via the enforcement of the Group Areas Act which insured that the majority of society was placed in largely poorly accessible areas. Non whites were stripped of their citizenship and became legal citizens of their tribally based homelands (Freuh, 2003: 6). Although not all non-white South Africans lived in the townships, many of those who did, would catch public transport to work. Travel modes became segregated with separate busses for whites and non-whites. Private transport was rare in the non-white community.

After the elections in 1994, South Africa moved into a transition state with a very complex pattern of land use and subsequent patterns of transport use and demand. The under developed Bantustans land in the rural areas existed in parallel with well developed white owned commercial farming areas (Cox, 2003: 139). Towns and cities were well resourced in contrast to townships that lacked even basic amenities such as water, waste and transport links. The sheer degree of geographic disconnection between the two areas, and the dependence of the two racial groups on one another, rendered a heavy reliance on public transport. According to Khoza (1995) *"transport becomes the umbilical cord between living and work place."* (Khoza, 1995: 168). Subsidised rail and bus routes were provided under the apartheid regime to connect townships and urban centres, and as a result whites see these transportation types as dangerous and for the poor.

After 1994 transport was seen as both a social service and as a means of social reconstruction. According to the NTFP (1994), *"The transport industry should be used as an instrument of transformation. Emphasis should be placed on the creation of new business and empowerment as a tool in the economic process"*. However, NTFP was still criticized as it lacked any advocacy on non-conventional approaches to transport, leaving the already established but marginalized busses and mini-bus taxis to carry the load (Cox, 2003: 140).

Little mention was made of non-motorized transport and pedestrian interests in transport policies through the 1990's.

The 1996 White Paper for the first time formally identified the physical segregation of the apartheid policy as a major legacy to be dealt with in future transport policy strategy. It states: "*Land use and transport development are not integrated owing to a fragmentation of responsibilities for the administration, planning and regulation of the various aspects of land use, infrastructure, operations and regulations. This fragmentation and the legacy of apartheid policies has led to low density development, spatially dislocated settlements and urban sprawl, resulting in inordinately long commuting distances and times, low occupancy levels, high transport costs and low cost recovery.*" (South African Government, 1996)

When translated into policy intervention, however, the reality was the prioritization of road building projects rather than education and infrastructure for non-motorized transport and public transport. Further targets governing land and transport use was that commuting should be no longer than forty kilometres of one hour and that public transport should be promoted to achieve an 80:20 public: private split (Cox, 2010: 140). However in reality urban sprawl has continued as a result of separation of communities by income and the building on low cost housing on the cheapest land available, usually far from economic centres and work.

Although the National Land Transport Transition Act 2000 planned to "*Give higher priority to public transport than private transport by ensuring the provision of adequate public transport services and applying travel demand management measures to discourage private transport*", the reality is that the dependence on the car is rapidly increasing. However the FIFA World Cup 2010 was used to lever multilateral funding assistance for the renewal of public transport facilities (Cox, 2010: 141). For host cities the world cup acted as a catalyst for change to achieve fundamental, appropriate improvements to the South African public transport system (Department of Transport, 2007: 5). Among the interventions is the Gautrain Initiative and Rea Vaya BRT system in Gauteng; a public transport corridor/BRT scheme in Port Elizabeth; road management in Mbombela; non-motorized transport interventions in Polokwane and Rustenberg; a travel demand management project in Cape Town; and the building of King Shaka International Airport in Durban, as well as non-motorized transport interventions in the form of the Walking Durban Initiative and the integration of the People Mover Bus Service in the Durban CBD.

### 3.3.3 Rea Vaya Bus Rapid Transit (BRT) System

According to Philip Rutkiewicz of Osmond Lange Architects and Planners, the story of Rea Vaya, from the beginnings of the seed being planted to the running of public busses on a regular timetable on dedicated routes across Johannesburg, was five years in the making. It is an important part in the transformation of Johannesburg into a modern, world-class African city, correcting the imbalances caused by the apartheid regime. In the past affordable and efficient public transport was unavailable to vast numbers of commuters who were forcefully settled out the outskirts of Johannesburg. Living far from economic and business nodes, these people became increasingly dependent on minibus taxis. This in turn, increased vehicle numbers on the road, creating significant congestion problems.

Given these challenges, the City of Johannesburg needed to map a different way forward. The City drafted its first Integrated Transport Plan (ITP) in 2003, which outlined the need to connect the many different economic nodes and residential areas through an integrated transport network (Rea Vaya/BRT, 2011: 2). What was needed was a public transport system that could move commuters from one destination to another with speed and efficiency. With this goal in mind the idea of a Bus Rapid Transit (BRT) system entered the frame. According to Rutkiewicz a BRT is the creation of a rail like performance using road based technologies.

Utilizing cities in Latin America as case studies, including Guayaquil in Ecuador and Bogota in Colombia, it was agreed that a BRT system could be adapted to suit the Johannesburg context (Rea Vaya/BRT, 2011: 4). Furthermore the inclusion of the taxi industry in the development of a BRT system, would be in line with national government imperatives.

The long term vision is for Rea Vaya to develop a system that brings public transport to the people, with the goal of ensuring that 85% of the population will be within 500 metres of a Rea Vaya bus route (Rea vaya/BRT, 2011: 4). On completion there will be a network of routes stretching 300 kilometres, connecting all the cities nodes together via a fast and efficient system.



Figure 3.8- Thokoza Park to Ellis Park East Route. (Author)

## REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct

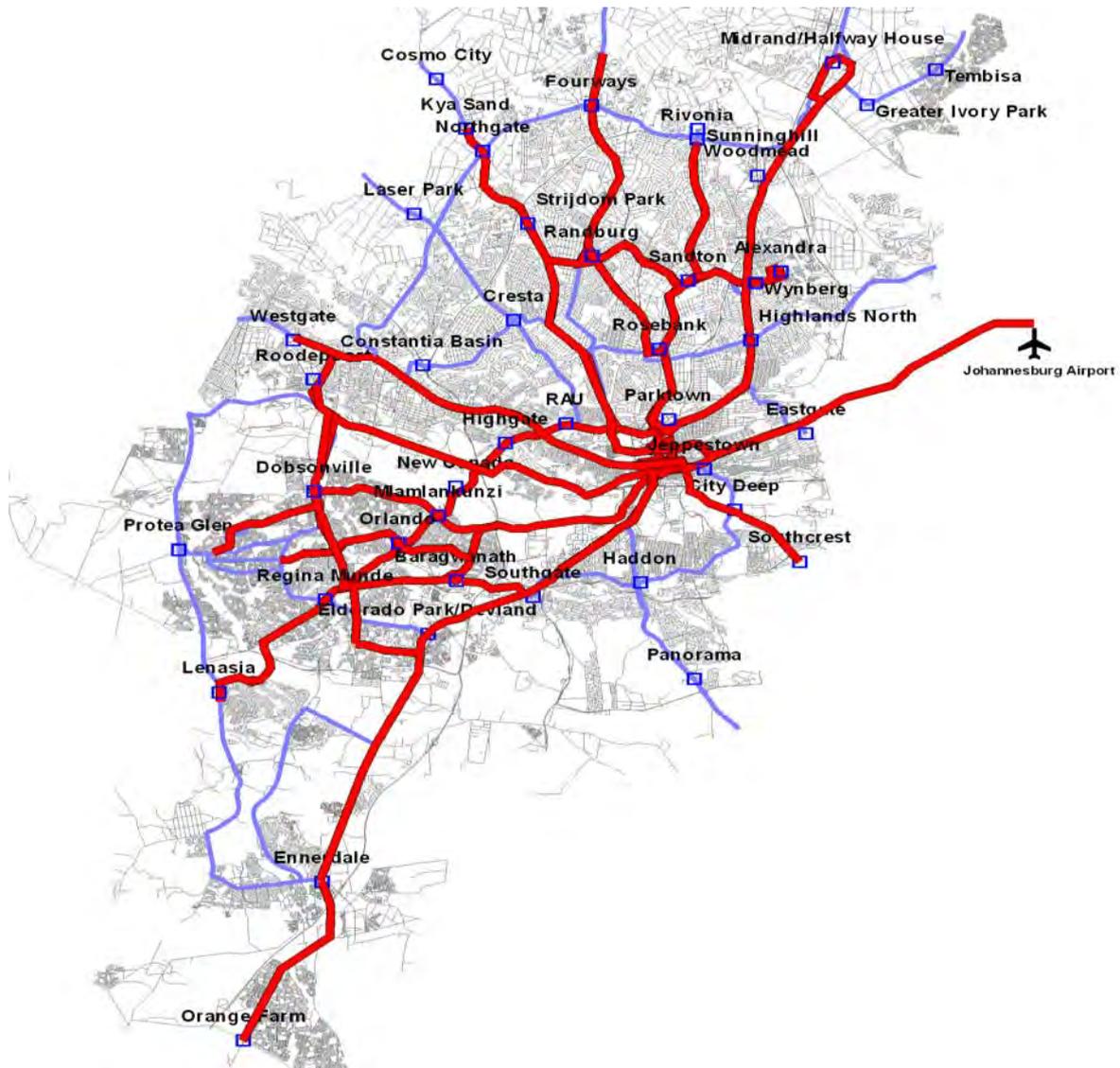


Figure 3.9- The full BRT system: approximately 300 kilometres of routes (Rutkiewicz, 2011)



Figure 3.10- A Rea Vaya BRT bus driver, previously employed as a taxi driver (Author)

With regard to job creation the Rea Vaya system has achieved its goals. Former taxi drivers were trained by Scania to drive the Rea Vaya busses. They all have been full time employed since July 2010. The author spoke to two of the drivers who were both previously taxi drivers. They both agree that the system works well and for the first time they have stable salary, shorter hours, medical aid, pension and Unemployment Insurance Fund (UIF) payments.

## REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct

Jonathan Manning of Ikemeleng Architects says the Rea Vaya project set out to redefine public transport in South Africa and reverse its stigma as being dirty, low quality, unreliable and unsafe (Manning, 2009: 128). The station buildings manifest the physical substance of the system, becoming icons of Johannesburg's transport network. According to Manning the stations seek to embody a rebranded notion of public transport and public space, linked to high quality service with a slick, clean and modern environment (Manning, 2009: 128).

The design was inspired by international standards and trends. *"Transport buildings are emphasised structurally and functionally and derive from and celebrate engineering detail"* says Manning (Rea Vaya/BRT, 2011: 45). Each station is uniquely African with public art adorning the various structures across the city- a purely aesthetic approach. It seems little has been done to create meaningful places for social interaction to occur, and in turn begin to resolve social identity issues in South Africa. This could be due to the site constraints of the various stations, with long, rectilinear plans being the norm.



Figure 3.11- Library Gardens Rea Vaya Station. (Author)

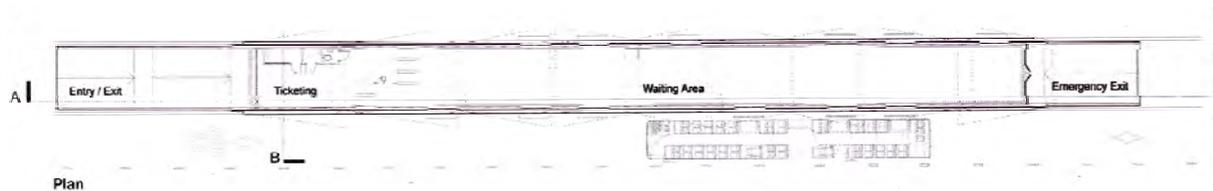


Figure 3.12- Typical Rea Vaya station plan. (Manning, 2009: 129)

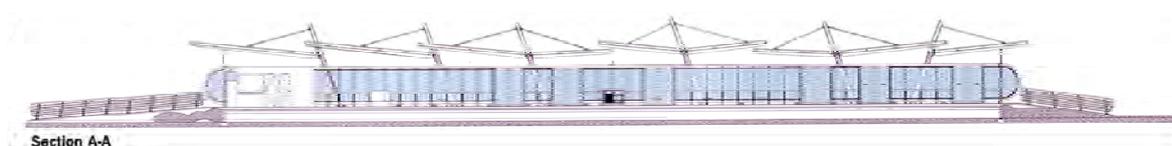


Figure 3.13- Typical cross section through a Rea Vaya Station. (Manning, 2009: 128)

**REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct**



Figure 3.14- A trip on the Rea Vaya BRT system between Ellis Park and Library Gardens, Johannesburg. (Author)

### **3.3.4 The Gautrain Initiative**

The Gautrain Initiative is the first integrated rapid-rail and bus network on the African continent. The system consists of three services:

- the north/south commuter route
- the east/west commuter route
- the airport express service, which uses the same tracks and facilities as the east/west route. (Eicker, 2008: 14)

The project's first phase, comprising four stations along 20 kilometres of track was opened on 8 June 2010. The second phase was opened for commercial service on 2 August 2011, linking the metropolitan areas of Johannesburg, Ekurhuleni and Pretoria through a route extending from Rosebank Station in Johannesburg to Hatfield Station in Tshwane (FM, 2011: 3). Amanda Nair of the Gautrain Management Company (GMA) states, *"the Gautrain is quite a technological breakthrough in rail in South Africa. It is not only redefining the rail industry but the public transport industry as a whole. It is setting a completely different set of parameters around quality, service delivery and service excellence"* (FM, 2011: 3).



Figure 3.15- Redefining the public transport industry: The Gautrain Sandton station arrivals platform. (Author)

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According to Andrew Marsey, ex head of planning at Arup, principle planners of The Gautrain Initiative, the focus of the project was the realization of four key points:

- Safety
- Reliability
- Predictability
- Comfort

(Marsey, 2012)

Amanda Nair agrees saying, *"In terms of affordability, comfort, security and speed, this is the first segment of what one hopes will be an ongoing programme for the delivery of the same levels of excellence"* (FM, 2011: 3). Nair stresses that the intent of the system is not just about public transport and getting people out of their cars. It's also about redefining the urban landscape and getting the urban system to work in a better way and be more functional. *"As the system operates and things start to happen around it, a more cohesive urban form will be created around the station nodes and one will start to see the economic growth around the station precincts"* (FM, 2011: 4). Jack van der Merwe, CEO of GMA continues, *"We expected to see densification and mixed use land development being built around the stations, but we weren't prepared for the speed and volume at which it occurred"* (FM, 2011: 8).



Figure 3.16- The Gautrain Route Map. ([www.gautrain.co.za](http://www.gautrain.co.za))

## REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct

One of the primary objectives of The Gautrain Initiative focuses on "city sustainability". Van der Merwe states, *"If you can get people back into the CBD, where there is office space available, you're better utilizing what's been invested in the city. With the Gautrain we set out to address congestion on the roads and to make public transport a mode of choice rather than a mode of force. Public transport must be a balanced carrot and stick. You must be able to offer a viable alternative"* (FM, 2011: 8). Van der Merwe concludes that we cannot continue to build more roads to solve our transport problems. We have to start looking at public transport solutions like the Gautrain and the BRT system.

Gauteng Transport MEC Ismail Vadi is excited with the development being made with The Gautrain Initiative, however he does accept that not everyone will be able to afford the system, but at the same time firmly believes it is not a system for the middle-class only. He says, *"I think our prices are competitive. I had to speak to taxi owners to believe how competitive we really are. They say a taxi from Hatfield in Pretoria to Bosman Street costs R10, and from Bosman Street to Park Station in Johannesburg its R30. That's R40 for a trip. On the Gautrain, if you have a monthly ticket, it will cost you R30 for the same trip"* (FM, 2011: 12). On top of that the Gautrain bus service runs in a network surrounding the various stations, preventing commuters from having to use their vehicles to get to the station. Where this is not possible parking facilities have been provided on the Gautrain station site, or directly adjacent to it. All these facilities come at a reduced rate if the train is being utilized.



Figure 3.17- Park Station in Central Johannesburg with the Gautrain park-and-ride facility in the background. (Author)

### **3.3.5 A City's Identity - Transport Architecture**

Transport infrastructure plays an essential role in establishing a city's identity as well as contributing to the identity of the public transport industry itself. Gunther Wagner of Urban Solutions says that the evolution of South African architecture over the past fifteen years is a complex and multilayered question that many architects have been trying to come to terms with, and at the core of this question stands transport architecture (Wagner, 2012). Tom Steer, senior associate on the Gautrain Architects Joint Venture states that *"When people arrive in cities with well-organised transport networks, they breathe a sigh of relief. The identity of the transport system forms an integral part of the city's identity and the way it is perceived internationally."* (Theunissen, 2009: 22). Mokena Makeka of Makeka Design Laboratory agrees saying *"The role that transport facilities play in the creation of an identity for both the industry itself and the city is essential, and one that is often underplayed in this country"* (Theunissen, 2009: 22).

Nicola Theunissen in her article "A City's Brand Identity - Transport Architecture" (2009), poses the question to three architects, Gunther Wagner, Mokena Makeka and Tom Steer. What does the South African transport facility of the future look like? Where are we heading and how do we balance international benchmarks with our unique African identity? The architects came up with the following points which will be expanded on here after:

- 'Memory fabric' of the city
- Public funds required
- Need to apply international best practise
- Excellence required
- African context vital
- 'Ubuntu' - the essence
- Safer, functional design
- Balance between functionality and aesthetics
- Public art a vital component
- Part of the urban fabric

### **'Memory fabric' of the city**

Mokena Makeka feel that architects have to play a dominant role in developing transport facilities. *"We need to let transport facilities play an active role as part of the 'memory fabric' of a city. Transport facilities are at the heart of most urban metropolises - or at least they should be. They therefore have a greater resonance in the everyday lives of people"* (Theunissen, 2009: 23). Makeka also feels that it is important that architects realize the potential of transport architecture in creating identity. *"Up until now it is an underexplored avenue"* (Theunissen, 2009: 23). South Africa's historical context has, perhaps, not presented a more vivid yet distorted way of expressing itself than it has through public transport.

### **Public funds required**

As discussed in section 3.3.1 one of the most challenging issues regarding public transport design is limited fund allocation to the development of these facilities. Section 3.2.2 discusses stable funding as one of the four pillars of sustainable urban transportation and how important it is if we are to move forward. Tom Steer stresses that money in his opinion is being directed down the wrong avenues. *"There is a lack of preparedness; a lack of planning on existing rail infrastructure. The Passenger Rail Agency of South Africa (PRASA) gets small pockets of funding from government but certainly not what it deserves. The South African National Roads Agency Limited is, however, spending billions on upgrading our freeways. in terms of resources that is what needs to be going into rail"* (Theunissen, 2009: 23). This clearly shows that the car and highway are very much still alive in South Africa - too much so in fact.

### **Need to apply international best practise**

In South Africa there is very little documentation or specifications in place in terms of requirements for new public transport design in a local context. According to Tom Steer there is no best practise or benchmark (Theunissen, 2009: 23). According to Steer however, this is not the end of the road. He argues that it is vital to bring international best practise to the attention of clients and insist that it happens. Steer points to the Gautrain Initiative as an example, *"With the Gautrain we had very clear indications of what was required. Comprehensive studies were conducted"* (Theunissen, 2009: 23). This is however, easier said than done.

## **Excellence required**

According to local architect Derek Van Heerden, South Africa carries a legacy of below standard facilities rooted in apartheid, *"Since South African railway stations were designed primarily for the black workers at the time of apartheid, their planning was based on getting people through the station only with no attempt to create a place with an inviting character"* (Brett, 2011: 62). This view is echoed by Tom Steer, *"The majority of Metrorail stations - built during apartheid - encompass the minimum facility design: galvanised handrails, basic concrete overpasses, little shelters with few benches and tarmac platforms"* (Theunissen, 2009:24).

Steer notes that if we want to push South Africa into the First World, we have to begin designing according to international standards. Public transport facilities are catalytic attractions therefore their design standard needs to be of sufficient standard to attract all types of investment. Steer continues stating *"There is no clear vision for what rail and bus infrastructure - or intermodality - is all about, If one looks at international standards, there are phenomenal examples of organised, multi-faceted systems and that is what we should focus on in South Africa"* (Theunissen, 2009: 24). Gautrain Sandton Station is an example of international quality infrastructure. However, based on current observations, one still questions its ability to act as a modal interchange. Its integration with other modes of public transport including taxi's and metro busses is non-existent and its ability to integrate retail opportunities (formal or informal trade) and allow for them to occur or develop is questionable. The station quite clearly turns its back on the adjacent taxi rank, and through its spatial configuration, excludes rather than integrates them into the urban fabric



Figure 3.18- The Gautrain Sandton Station, Johannesburg, South Africa. (Author)

### **African Context Vital**

Having identified that South Africa needs to look to international best practise for standards of transport facilities, how can it at the same time remain locally appropriate and respond to South Africa's unique context. Gunther Wagner feels that new examples of transport architecture in South Africa represent Eurocentric approaches within a South African context. *"Many of the new designs are not an expression of what South Africa is all about but can be found anywhere else in the world. Opportunities have been lost"* (Theunissen, 2009: 24). Mokena Makeka tends to disagree slightly. He feels that the modern day transport facility will not differ as much as we think from the contemporary European transport facility, except in the role that commerce has to play. Formalized commerce versus informal commerce needs to be complementary and synergized in a South African Context. Makeka point towards the Cape town Station precinct project which his company, Makeka Design Laboratory is involved in. *"The informal economy remains the principle employer of people across the country. It is also the place where entrepreneurship and creativity find foreground place. If we are to make transport facilities that respond to the African condition and are really inspiring, stations need to be transition zones between the formal and informal economy. They need to become incubators for economic activity, and express the vibrancy and diversity of what Africa is all about"* (Theunissen, 2009: 24).

Other examples of effective integration of the informal sector within the context of a transport hub are the BaraCity Market and Transport Facility in Soweto, Johannesburg and the Metro Mall Market and Taxi Rank in Newtown, Johannesburg (see section 5.2)



Figure 3.19- BaraCity Taxi Rank, Soweto, Johannesburg - Effective integration of informal trade into a transport facility. (Author)

### 'Ubuntu' - the essence

An emerging focus in the principles of good transport interchanges is to design for the people and pedestrians first. The facilities must be made easier, safer and more 'walkable' for pedestrians. According to Makeka, architects and urban designers have been talking about designing for pedestrians and pedestrian movements for hundreds of years. *"One of the challenges we have is that pedestrians are in fact your clientele. It's about people. What needs to happen with regard to our transport infrastructure is to make it very easy for intermodality to take place. the pedestrian who decides to ride his bicycle or catch the bus or train must be accommodated so that they do not feel limited"* (Theunissen, 2009: 24). (see more in section 3.2.2 on effective neighbourhood design)

In an interview with Andrew Marsey of ARUP engineers and principle planner of The Gautrain Initiative states that, *"The philosophy in terms of design objectives was based on the principle of interaction under an acacia tree. In rural KwaZulu-Natal you have clumps of acacia trees that become nodes of gathering - bartering points - and spaces where people can meet and interact. It is mutual ground where people feel safe. This concept of networking and community interaction is paramount in creating nodes for people to mingle and enjoy their urban surroundings"*. One has to question the basis of this comment. The various stations and platforms visited by the author hardly allow for 'gathering' or bartering to occur. No formal spaces have been created to encourage community interaction or networking. The spaces created are purely functional, to assist with getting people through as quickly and efficiently as possible.



Figure 3.20- The acacia tree is the conceptual idea behind the columns supporting the roof on concourse level at Rhodesfield Station. (Author)

### **Safer, functional design**

The Gautrain's acacia tree design concept is represented consistently in structural elements throughout the stations. A Gautrain System Identity (GSI) was created which comprised guidelines, generic drawings, and specifications to help other architects working on the system to create uniformity and coherence, creating a specific identity and brand (Eicker, 2008: 14). This included functional and aesthetic aspects relating to civil structures, stations and depots, finishes and colours, landscaping and environmental management, corporate identity, signage and information systems other key design elements. According to Andrew Marsey, *"Each station has its own identity but also conforms to an overall identity. This is important as they are very public buildings that will have an effect on local communities"* (Marsey, 2012). It is also noted that a specific brand of design allows users to navigate the environment easily. The Gautrain station becomes an unmistakable landmark that can be identified from afar.

Materials used in the stations were rated according to a scale system and broken down further into materials for high-, medium- and low-impact zones. Typical high-impact materials include granite, ceramics and stone. Medium-impact include sand acrylic renders with anti-graffiti topcoats and standard paints for low-impact areas. The Gautrain station show that transport interchanges do not have to be as severely utilitarian as seen in South Africa, however one must take into consideration budget constraints when analyzing similar building typologies.



Figure 3.21- High quality finishes as seen at the Gautrain Sandton Station. (Author)

### Balance between functionality and aesthetics

Mokena Makeka says that the key to an aesthetically pleasing transport facility is to balance functionality and aesthetics. *"We cannot have facilities with little or no aesthetic value because that affects the public perception of the industry and the facility and, therefore, the ability of people to use it and to want to linger there"* (Theunissen, 2009: 25). The objective is to therefore integrate technology, aesthetics and function. In line with putting people first there should be a continuous focus on choosing materials that are safe and consider the well being of the commuter.

### Public art a vital component



Figure 3.22- Local art adorns the various trading courtyards at BaraCity Market and Taxi Rank. (Author)

The integration of public art in various forms is a vital component of the modern day South African transport interchange as a means of formulating identity. Mokena Mokeka says, *"If one begins to understand the role of transport facilities within the context of formulating identity, public art becomes critical. It is also a way of having the public interact with the building and it is part of social service"* (Theunissen, 2009: 5).

Examples of local art adorning transport facilities around South Africa can be found at the Rea Vaya BRT stations, Cape Town Train Station, BaraCity Market and Transport Facility, Metro Mall Market and Taxi Rank and Ellis Park Transport Hub.

It is the author's opinion, however, that in

order to create architecture that speaks of the identity of a people, then the people must be involved in every aspect of its creation and expression. It is not enough to merely allude to a South African ambience through the involvement of local artists, and craftsmen as these elements become purely aesthetic, superficial and devoid of a deeper meaning.

### **Part of the urban fabric**

Tom Steer concludes, *"The African transport facility is a community-integrated and -focused facility of a high standard"* (Theunissen, 2009: 25). According to Steer teamwork, networking and integration are vital. As Steer puts it, *"If South African transport design is not approached with an 'ubuntu' spirit, we will end up with haphazard design solutions to transport facilities - much like South Africa of the past"* (Theunissen, 2009: 25).

Mokena Makeka says *"I would like architects to take on the challenge of understanding that transport facilities are the foreground objects in the urban fabric of a city and should not be relegated to the background"* (Theunissen, 2009: 25).

Clear concepts that are derived from these key factors that need to be taken into consideration when undertaking the design of a transport facility in South Africa are multimodality, pedestrianism, focus on the humanistic worth that must be fundamental to new designs in a functional manner and, essentially, the importance of transport nodes in dictating the urban form of the city

### **3.4 CONCLUSION**

This chapter set out to address issues surrounding transport in the contemporary context and how sustainable measures can aid in alleviating some of these problems. The first section set out to identify global issues surrounding urban transportation. It identified the essential components of sustainable urban transportation systems with the term 'pillar' has been used for good reason. The aim was to understand that all four pillars are necessary for sustainable urban transportation to be achieved: all have to be well established in order for cities to develop in a sustainable fashion. For example, fixed rail urban transit systems have the potential to make cities more environmentally sustainable, but unless they are supported with effective land-use policy, then transit systems might be financially unsustainable. Conversely, establishing a neo-traditional neighbourhood in a sea of suburban sprawl may do little to promote transport by sustainable modes. The necessary investments in sustainable infrastructure systems cannot be made without suitable funding mechanisms. Without suitable regional governance, it is hard to see how either integrated land use planning or sustainable funding mechanisms can be achieved. Sustainable urban transportation arguably requires all four pillars.

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Following from that the issues surrounding the age of the automobile and its possible alternatives was addressed. What was gathered is that the problem is not the car per se, but rather that the system of auto mobility locks into itself its own justification, norms and expectations, which means that most individuals are unable to conceive solutions to their own mobility issues. To bring about the changes requires the user to unlock themselves from car dependence and present a visible challenge to social norms. As suggested above the car is only part of the problem. Real sustainable transport patterns require comprehensive and connected strategies that will transform mobility patterns. Litman (1999) says that people require a 'paradigm shift'. Cox (2010) concludes that institutional changes need to be made in order to support changes for sustainable mobility (Cox, 2010: 66).

The final portion dealing with global issues investigated trends that have begun to develop in transport interchange facilities and these should be understood before making new suggestions. The transport interchange is a relatively new building typology, with relevant examples being analyzed in chapter 5. The study into transport in the urban context reveals the importance of a well developed brief prior to any transport related project. The immediate urban context is an important consideration as well as economic, environmental and social impacts.

A critical review of transport related development in South Africa, provided evidence that major initiatives are being rolled out to improve public transport in the country. The process is ongoing and will possibly continue to be over the next fifteen years. At present each mode of public transport is being dealt with individually, which can result in sub-optimal transport systems in the main urban and metropolitan areas. One of the challenges is to integrate the various transport sectors so that they all can focus on achieving a similar goal - a seamless public transport service across all transport areas.

Through the investigation of identity in transport architecture in South Africa, it is possible to conclude that opportunities have, in the past, been lost when providing architectural interventions for the public transport system. Various architects agree that public transport interchanges are the heart beat of a city and as a result can reflect the identity of not only the industry itself, but the city too.

## **CHAPTER 4: PRECEDENT STUDIES**

### **4.1 INTRODUCTION**

It is necessary in the context of this study to understand how identity has been reflected in architectural expression through the critical analysis of precedent. In the case of transport architecture in South Africa, as discussed in section 3.3.5, there is very little documentation or specifications in place in terms of requirements for new public transport design in a local context. As a result it is vital to look towards international best practise as the benchmark. It is the intention that by drawing on the positives and negatives of each precedent, a direction can be found to inform the design process.

The first study selected is the Roma Termini Station in Rome, Italy. Termini is one of the biggest and busiest stations in Europe and is the hub for public transport in Rome. The building mixes a rich history rooted in roman classical architecture and a modern adaptation to deal with the demands of transport in the 21st Century. The study was selected due to its strong and steadfast local identity despite external influences as a result of Rome being one of the most popular tourist destinations in the world. Representing the local people and meeting their demands should be the primary focus for transport buildings around the world, allowing them to be accepted into society and in turn promoting the use of public transport. Rome Termini has managed to do this as well as adjust to the constant strain of globalism and increased passenger travel.

The second study selected is the Southern Cross Station in Melbourne, Australia. The station is one of Australia's main railway terminus. Although historically a train station the facility was designed as a transport interchange from its early conceptual stage. The station offers a contrast to Rome-Termini Station in its approach to identity formulation. The project utilises imagery and iconism to create a new identity for the station and the public transport industry as a whole. The striking element of the project is the roof over the building. It creates a distinct identity and acts as a landmark on the cities landscape. Here modern, transparent and slick architecture meets functional and adaptive design.

## 4.2 ROMA TERMINI STATION, ROME, ITALY

### 4.2.1 Introduction

Roma Termini station is located in the Roman quarter Termini and is the main station situated in the heart of the Italian capital, in piazza Cinquecento. The station has regular train services to all the major Italian and European cities as well as serving Rome's major airport Leonardo da Vinci-Fiumicino. With 29 platforms, over 225000 square metres of floor space, 480000 passengers per day and over 150 million commuters a year, Termini is one of the largest stations in Europe and has come to play a primary role in the urban, regional, national and international transport system ([www.grandistazioni.it](http://www.grandistazioni.it)).

Roma Termini is also the central hub for public transport in Rome. Both of the current Metro lines, A (Red) and B (Blue), intersect at Termini. The main bus station is situated in the piazza Cinquecento which has metro busses servicing Rome and its immediate surroundings, airport express busses to Leonardo da Vinci-Fiumicino Airport and Rome Ciampino Airport, as well as long distance bus services to all the major Italian cities. Metered taxi's operate via a pick up/drop off area adjacent the main entrance off piazza Cinquecento with adequate holding facilities. The station also boasts extensive park and ride facilities with large amounts of motorcycle parking within the precinct, as motorcycles are the main form of private transport within the city. The main tram lines of the city cross at Porta Maggiore, some 1.5km east of the station.

### 4.2.2 Historical Background

On 25 February 1863, Pope Pius IX opened the first official Termini Station as the terminus of the Rome-Frascati, Rome-Civitavecchia and Rome-Ceprano lines ([www.trenitalia.it](http://www.trenitalia.it)). The city chose to build one central station with all three lines terminating at one place. The station was designed by Salvatore Bianchi in 1867 ([www.grandistazioni.it](http://www.grandistazioni.it)). Although it initially took criticism as being too big for the needs of the city, it took just fifteen years to be inadequate for the ever increasing needs of rail passengers.

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Figure 4.1- The front facade of the first permanent Termini building, 1890 ([www.grandistazioni.it](http://www.grandistazioni.it))

In 1925, the State Railways' Works Department appointed architect Angiolo Mazzoni to investigate the proposed enlargement of the original building ([www.grandistazioni.it](http://www.grandistazioni.it)). The initial studies proposed an underground station consisting of two terminus, north and south, whose lines, passing underground through the city would meet at Termini, viewed as the central transit station ([www.grandistazioni.it](http://www.grandistazioni.it)).

The project was eventually given the go ahead in February 1939. A monumental front block with a vast portico and entrance hall, serving no purpose other to look impressive meant rail services were relegated to the side wings, which still exist today ([www.grandistazioni.it](http://www.grandistazioni.it)).

However, as a result of World War Two, construction was halted. With the changing political climate it seemed appropriate to re-examine the proposal with only the side wings being built. In 1947 a national competition was launched whose winners, the Montuori Vitellozzi group, was assigned the task of completing Mazzoni's work ([www.grandistazioni.it](http://www.grandistazioni.it)).

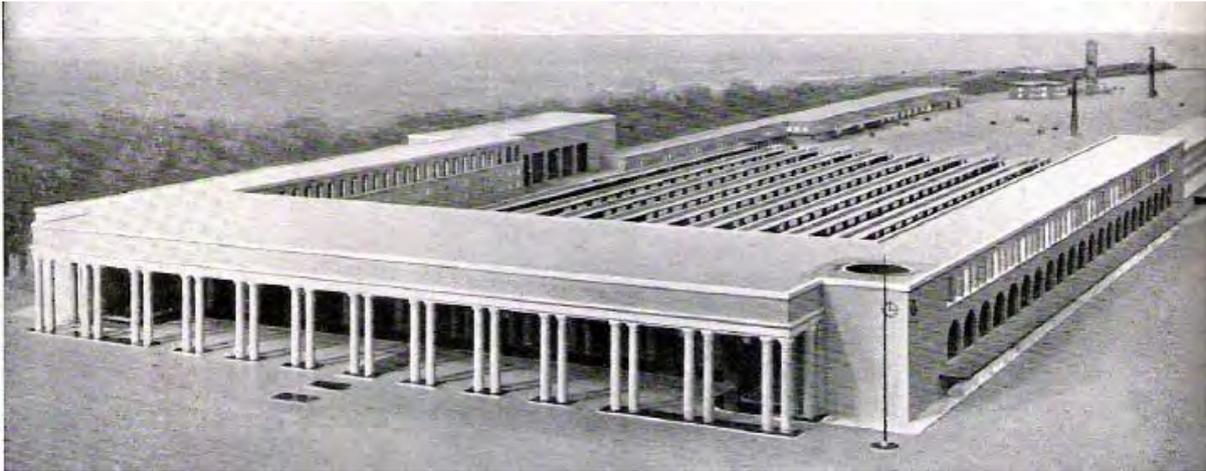


Figure 4.2- Mazzoni's Termini station proposal with the vast portico and adjacent wings, 1939 ([www.grandistazioni.it](http://www.grandistazioni.it))

### **4.2.3 Current Building**

The predominant characteristics required of the new design were clear, transparent and functional lines, harmonizing with what had already been built and coexisting with the remains of the walls of the Agger Servianus ([www.grandistazioni.it](http://www.grandistazioni.it)). The remains of the wall symbolically represent the continuity existing between the older and the modern parts of the building. It was decided that the building be split into four distinct parts, connected to the existing wings of the station and the piazza Cinquecento:

- the entrance hall
  - the ticketing hall
  - the central gallery
  - the external restaurant
- ([www.grandistazioni.it](http://www.grandistazioni.it))

The entrance hall is characterized by its extremely long, modernist facade in travertine and by the gravity defying, double curved reinforced concrete roof by Pier Luigi Nervi. Thirty three reinforced, curved ribs make up the structure of the roof. The shape is inspired by the arch of the adjacent roman wall and is meant to represent the flowing movement of rail transport ([www.trenitalia.it](http://www.trenitalia.it)). The front building houses self service ticketing kiosks and waiting areas for busses and taxi cabs. The central gallery houses the offices of Trenitalia on the upper floors and a variety of services on the ground floor.

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Figure 4.3- The modern entrance hall of Termini Station opening onto piazza Cinquecento with the head gallery in the background, 2011 (Author)



Figure 4.4- The existing side wings by Mazzoni with the head gallery in the foreground. The Roman arch is a distinctive design component of the existing building. The extensive park and ride facilities for motorbikes can be seen in the foreground, 2011 (Author)

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In 2000 extensive upgrades were done to the station ([www.trenitalia.it](http://www.trenitalia.it)). Ticket offices were modernized, automated ticketing machines were introduced and the signage system, which in the past had been one of the chief obstacles of the station was redesigned creating a clear uniform style.



Figure 4.5- Upgraded signage is clear and uniform allowing for easy navigation ([www.grandistazione.it](http://www.grandistazione.it))

The Central Gallery, which was once merely a link between via Marsala and via Giolitti, has been transformed into a general compendium of everything termini has to offer. Accommodation ranges from service for commuters, attractive shopping outlets, fast food outlets and restaurants along its 220 metre length.



Figure 4.6- The Central Gallery is a hive of activity creating a trading link between the two ends of the station. The train platforms are to the left of the photo, 2008 (Author)

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The lower levels of the station which formed part of the network or paths to the metro underground rail services used to be a symbol of deterioration and misuse ([www.trenitalia.it](http://www.trenitalia.it)). The 2000 upgrade however transformed the underground network into a hive of activity through the creation of the Forum Termini shopping complex. It offers a vast range of commercial services and shops allowing commuters to partake in retail activity while switching between transport modes. Its 14000 square metres of window display creates a new station experience allowing the non travelling public to be actively integrated into Termini Station.



Figure 4.7- The underground shopping complex is a hive of activity throughout the day and provides a pleasant shopping experience ([www.grandistazione.it](http://www.grandistazione.it))

The two existing wings of the station designed by Mazzoni also underwent extensive renovations. Originally meant to be the front of the station and a rare example of futuristic architecture for its time, they had been sadly neglected throughout the years and it had ended up being a sight of decay and abandonment ([www.grandistazioni.it](http://www.grandistazioni.it)). The Mazzonian wing flanking via Giolitti has been revitalized by converting it into a multipurpose centre offering services of public utility and opportunities for shopping, food and refreshments and special events including concerts, exhibitions and social and cultural activity.

The Roma Termini Station shows quite clearly through allowing large, clearly defined spaces to move you allow opportunities for trade and interaction to occur.

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Figure 4.8- The Mazzonian wing of the building has been revitalized into a picturesque piece of classic roman architecture ([www.grandistazione.it](http://www.grandistazione.it))



Figure 4.9- A perspective plan showing the various buildings making up the station precinct. ([www.googlemaps.com](http://www.googlemaps.com))

#### **4.2.4 Architectural Identity**

The two wings designed for the station by Mazzoni have been conducted in a strict, neoclassical style. Both wings have high walls with perforations in the form of arcades or rectangular windows that are covered with travertine. The Mazzonian project sought to represent the identity of the Italian nation through the extensive use of marble ([www.grandistazione.it](http://www.grandistazione.it)). Various precious marbles typically found throughout Italy were used to cover floors and walls. Sandblasted brick is also prominent. The impressive brick arches remind one of ancient Roman structures rooting the building in rich Italian identity.

When speaking of the additions to the Termini station by the Montuori Vitellozzi group William Curtis in *Architecture since 1900* comments, *"In reality, several of the pre-war ideas and personalities continued to operate. Some of the best work extended the premises of the Italian 'rationalism' of the 1930s. The Termini Station in Rome was a clean-cut, modern structural idea integrated with a restrained classical rectangular exterior containing subliminal echoes"* (Curtis, 2004).

One can find both analogies and contrasts in the comparison of the architecture of Mazzoni and the Montuori Vitellozzi group. Mazzoni chose a lateral organization of the station and the Montuori Vitellozzi group an almost futuristic flow through the end building. Both also have clear classical references. The contrast between the work of Mazzoni and Montuori Vitellozzi group plays an important role in the history of the Roma Termini station ([www.grandistazione.it](http://www.grandistazione.it)). Mazzoni's work can quite easily be overlooked, although both parts of the building show a quality that rivals the ancient ruins of Rome and together they present a strong and inseparable whole ([www.grandistazione.it](http://www.grandistazione.it)). Marco Ferrero in *La stazione dei Grandi Eventi* teaches us: *"Stazione Termini, in spite of it being the result of the combination of heterogeneous elements, is an organic whole in which the different targets and designs have created counter-positions rather than contrast"* (Ferrero, 1998).

Overall the building creates a strong Italian identity. It is a building that feels uniquely Italian when walking through it and although there is a rich mix of both locals and tourists within the space, that could quite easily result in a merging of local and international identities, this does not occur. Rome Termini is a landmark on the Rome cityscape, even though it sits near some of the most famous ruins in world history. It truly represents Italy and its people.

### 4.3 SOUTHERN CROSS STATION, MELBOURNE, AUSTRALIA

#### 4.3.1 Introduction

Southern Cross Station is situated in Melbourne Docklands, Victoria, Australia. It is located on Spencer Street between Collins and La Trobe Streets on the western edge of the central business district adjacent the Etihad stadium . The station is the biggest terminal in the Victoria precinct with fast rail connections to regional Victorian centres and new facilities for rail, taxi, tram and bus passengers including a highly developed shopping complex coupled with a variety of food outlets around a central court ([www.southerncrossstation.au.net](http://www.southerncrossstation.au.net)).

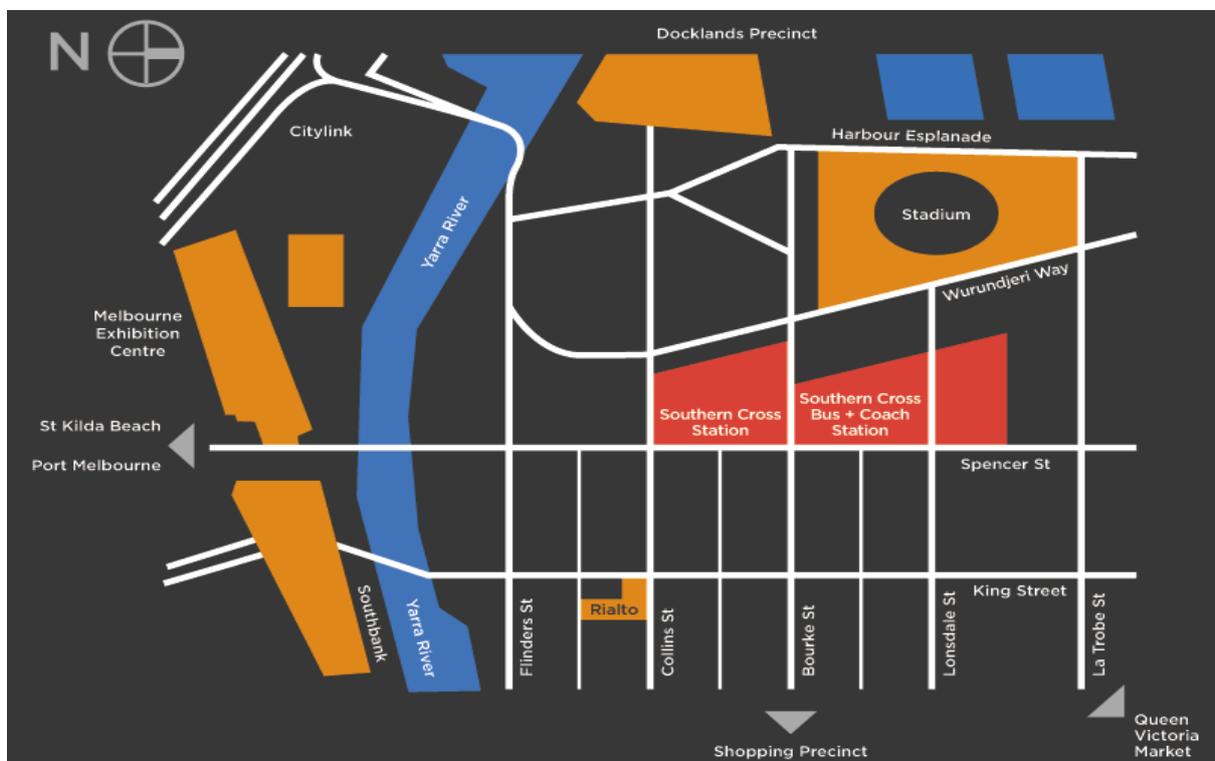


Figure 4.10- A precinct map showing the location of the station in relation to the docklands and shopping precinct and the Telstra Dome stadium. ([www.southerncrossstation.au.net](http://www.southerncrossstation.au.net))

The station is the terminus for the states regional railway network operated by V/Line, The Overland rail service to Adelaide, and the Countrylink XPT services to Sydney ([www.southerncrossstation.au.net](http://www.southerncrossstation.au.net)). It is also one of the five stations on the City Loop, a predominantly underground railway service that encircles the central business district. Southern Cross Station is the third busiest station in Melbourne, with an average of 42900 passengers per day (Roke, 2007: 52).

The station also has a bus terminal under the shopping complex servicing the regional bus routes as well as an airport shuttle to Melbourne Airport.

### **4.3.2 Historical Background**

The station was originally opened in 1859 as Batman's Hill Railway Station and was later changed to Spencer Street Station (Brown, 2002: 335). The station was originally a single platform running parallel to Spencer Street and a dock platform at the north end. It wasn't until 1874 that an extra platform was provided (Brown, 2002: 335). Between 1888 and 1894 that layout of the station altered, with new country platforms being built on the angle to Spencer Street, as they are positioned today (Brown, 2002: 336). The current bus terminal was the location for a number of suburban platforms.

A major development of the 1890's was the development of a viaduct linking Spencer Street and Flinders Street stations, and later with the electrification of the Melbourne metropolitan rail system, the viaduct was duplicated in 1915, providing four tracks between Flinders Street and Spencer Street ([www.southerncrossstation.au.net](http://www.southerncrossstation.au.net)).



Figure 4.11- A lithograph of the busy station complex in 1889 looking west ([www.wikimedia.org](http://www.wikimedia.org))

In 1960 work commenced on a modern design for Spencer Street Station, which was sparked by the construction of an interstate gauge railway link to Sydney (Brown, 2002: 337). The existing iron sheds were demolished and a new station building constructed with a new 413m main platform (Brown, 2002: 337). A new double viaduct was also build adjacent to the existing one bringing the number of tracks between Spencer Street and Flinders Street to six.

### **4.3.3 Current Building**

Until recently, Melbourne's docklands were characterized as the dirty and dangerous areas to the west of the city. As described by Rebecca Roke (2007) the area was known as "*Scruffy, industrial and weathered this was Melbourne's bad lands: off the grid, off the radar and neglected even by industry as modernised shipping methods pushed dock action further south*" (Roke, 2007: 52). As part of the greater Melbourne Docklands Redevelopment Scheme, the brownfield sites adjacent to the CBD didn't lie empty for long. Numerous residential projects and several public facilities including the Etihad stadium were constructed (Roke, 2007: 52).

However despite both government and private investment, the poor reputation of the Dockland's extended to the adjacent Spencer Street Station which acted as a barrier between the western city edge and the wasteland beyond towards Harbour Esplanade (Raisbeck, 2007: 48). The transformation of Spencer Street Station into Southern Cross Station bridges the urban void between the Dockland's and the edge of the city grid- it sits on the intersection between old and new. Unlike its predecessor, the civic responsibility of this primary transport hub, which accommodates all Melbourne's public transport - airport shuttle, local and interstate trains across sixteen platforms, trams, 30 bay bus terminal and 800 car parking spaces for park and ride, is proudly addressed and clearly delineated (Roke, 2007: 58).

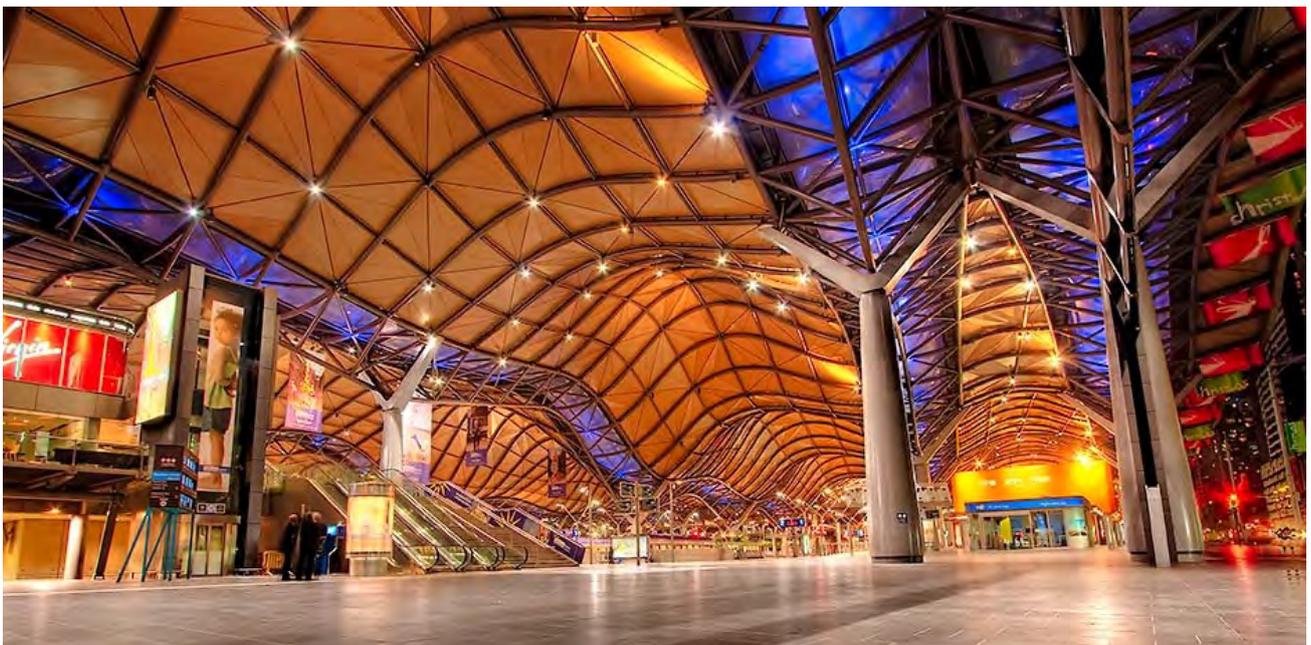


Figure 4.12- The dynamic internal spaces of Southern Cross station represent a shift in design philosophy for transport buildings (www.flickr.com)

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A crucial planning move was to shift the existing platforms north to allow for the architects to reinforce the external and public streets which dominate Melbourne's city grid distributing pedestrian flow to the periphery of the building activating the civic life of Spencer and Collins streets. An added advantage of the planning move was the creation of space for a shared concourse utilizing the natural grade of the land, prioritizing the main entry at Collins and Spencer Streets and providing a seamless transition from street to station (Raisbeck, 2007: 48). The concourse presents a vast, open volume, Public safety relies on connection rather than isolation and this linkage of commuters and unobtrusive surveillance is easily performed with good ambient lighting and uncluttered space.

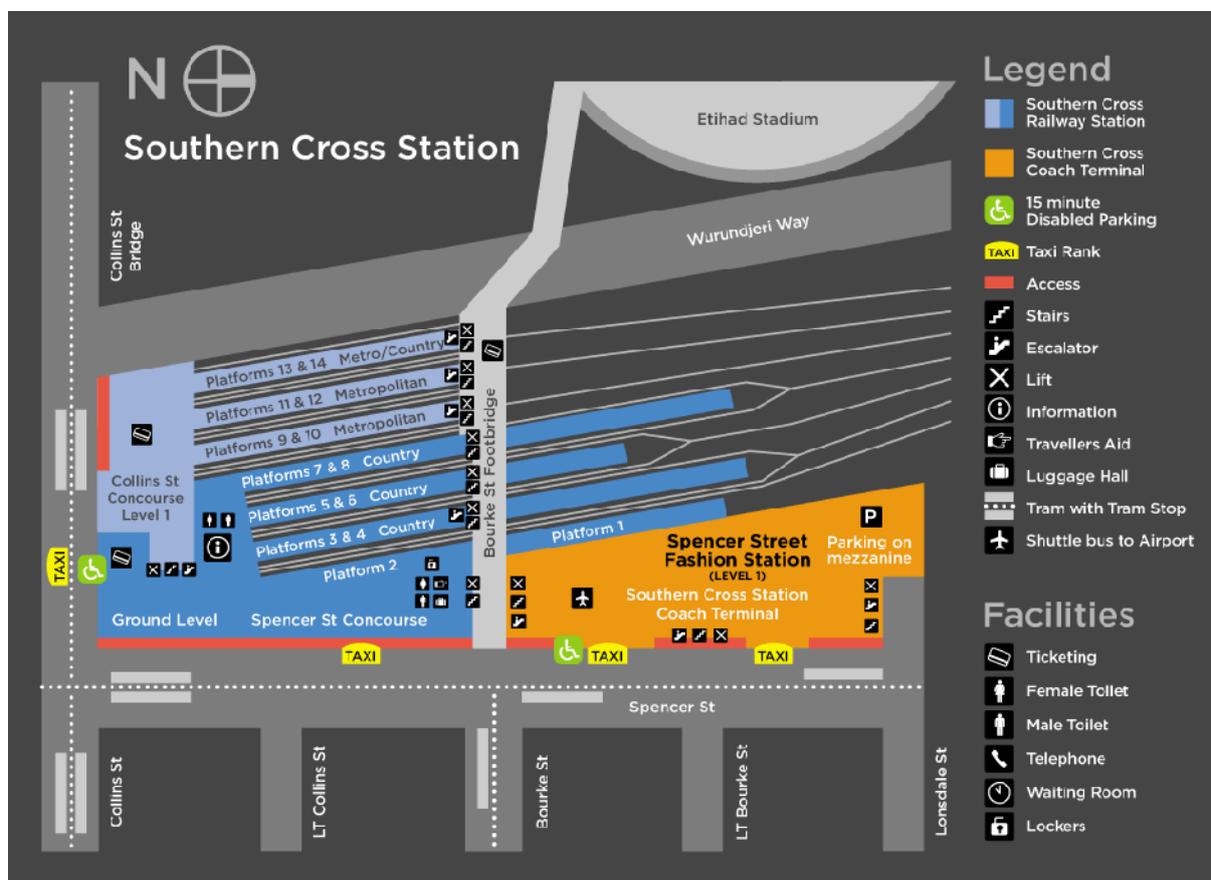


Figure 4.13- The plan of Southern Cross station identifying the various zones within the building (www.southerncrossstation.au.net)

The transparent facade along Spencer and Collins Streets helps to maintain the smooth transfer from exterior to interior. It maintains the dynamic relationship with the street edge, creating vistas through the building, resulting in a civic space that locates passengers in relation to the city. The facade also allows for natural illumination via ambient lighting preventing the need for large amounts of artificial light. The overhangs are substantial enough to prevent excessive head loads.

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Figure 4.14- The transparent activates the street edge, blurring the boundaries between external and internal (Raisbeck, 2007: 49)

Within the main skin of the building, bright yellow pods hover above the ground floor concourse on tapered steel legs providing accommodation for the administration of the station (Roke, 2007: 58). They read strongly against the monotone palette of aluminium, steel and concrete acting as landmarks within the building. Raising the pods into the air provides a defined retail space below, effective surveillance onto the platforms and concourse below and uninterrupted vistas in every direction, responding to the interconnection of different streets surrounding the building (Raisbeck, 2007: 54).



Figure 4.15- The administration pods are elevated to maximise visibility and orientation on the ground floor, defining uses into separate areas (Roke, 2007: 55)

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The design focus of the station is the dune-like roof that covers the entire building. The impressive structure acts as a visual bridge between the city centre and the Docklands, uniting all the elements of the interchange and providing a cool, shaded space on a civic scale (Dorrell, 2004: 8). Most importantly, however, is that the roof is not merely an iconic structure to create a landmark on the Melbourne streetscape - it is a perfect example of form follows function. From its initial conception the roof was conceived as an environmentally friendly performing structure. Without the need for mechanical ventilation it acts as an environmental filter which extracts diesel fumes from the trains (Raisbeck, 2007: 48). The passive ventilation system allows each of the aluminium domes to collect hot, dirty air through gaps in between the ceiling panels and extract the air through louvred Venturi caps (Roke, 2007: 58). The domes are strategically placed to respond to Melbourne's prevailing north-west and south-west winds, maximising the Venturi stack effect and providing a cool building during Melbourne's hash summers. Spine trusses run the length of the building with skylights corresponding to the structure above. This allows for natural daylight to penetrate deep into the spaces.

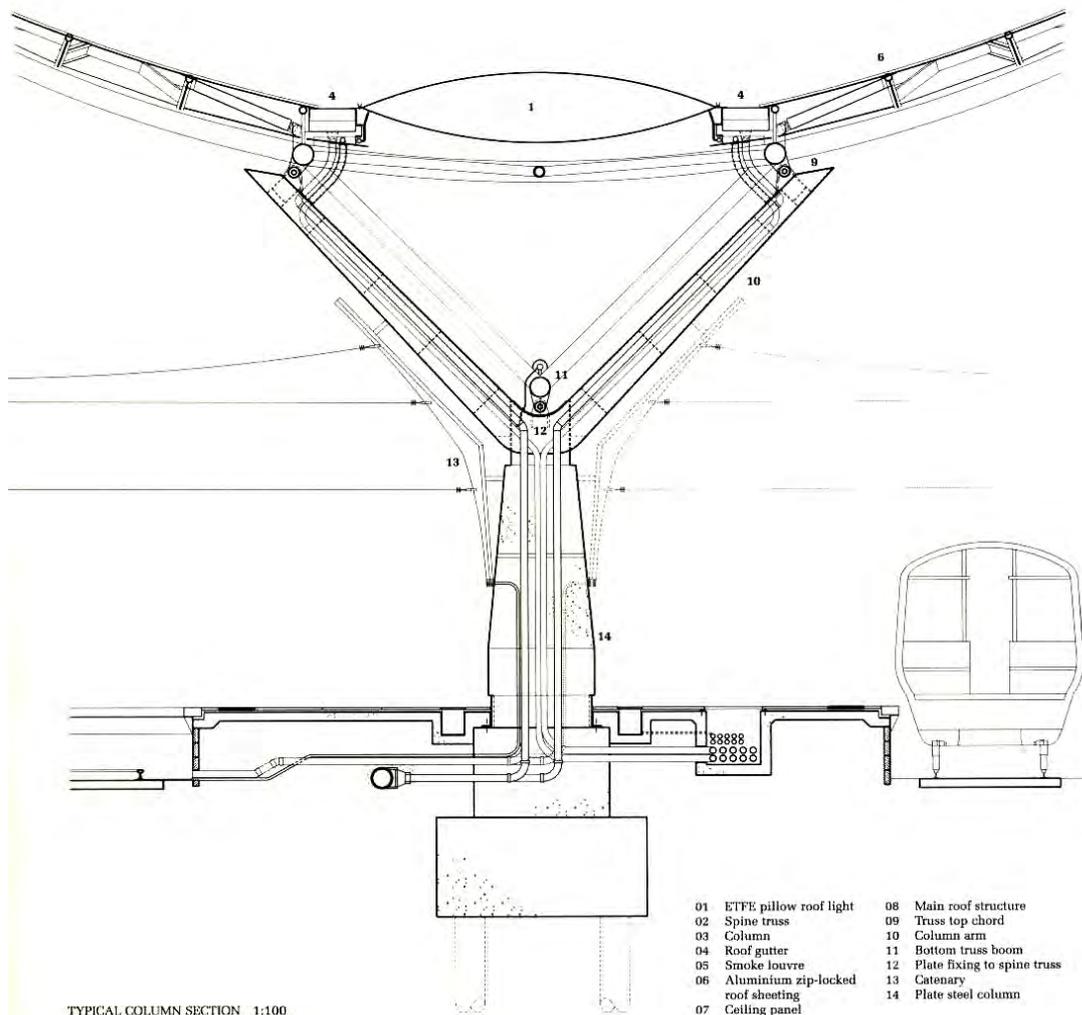


Figure 4.16- A typical section through the column with the roof light above (Raisbeck, 2007: 53)

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Figure 4.17- An image showing the typical bay of the roof structure. Columns are designed to intersect every second platform to maximise flexibility (Grimshaw, 2008: 799)

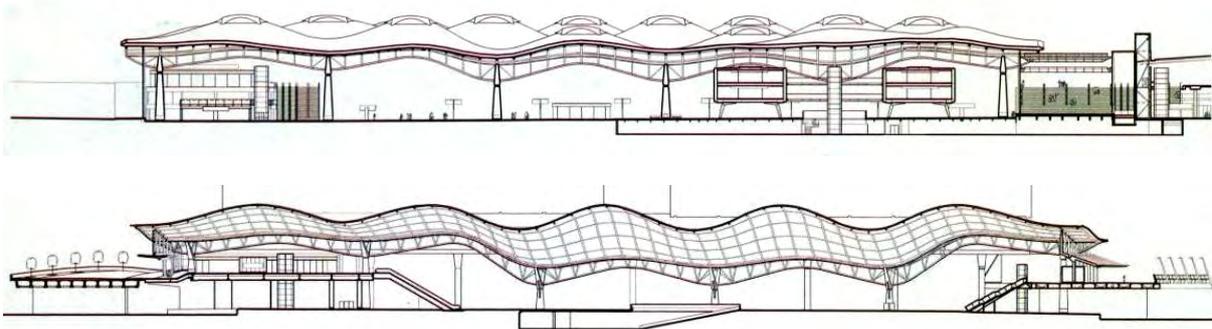


Figure 4.18- Cross sections through Spencer Street Elevation and north-south section (Roke, 2007: 54)

Possibly the biggest sustainable intervention is the storm water harvesting system implemented on the roof. It is estimated that 20 million litres of water will be saved each year. With a roof area of 34000 square metres, Southern Cross Station provides an excellent potential for storm water recycling (Grimshaw, 2008: 800). The water is collected from the roof and stored in two bladder-style tanks in the existing tunnels under the station. It is then used in the stations toilets, for cleaning, and for nearby parks and gardens (Roke, 2007: 58).

#### **4.3.4 Architectural Identity**

What Southern Cross Station shares with the grand railway experience is an almost gothic awe conjured by the 'audacious' roof fabric (Roke, 2007: 58). It seems Grimshaw's professed admiration for structures such as Brunel's Paddington Station have come through, but with an added environmental logic to improve the workings of a tried and tested barrel vault system- an identity which one can tie down in classical railway roof design (Raisbeck, 2007: 52). The design utilises the slope of the site to create split levels, and creates a roof form that responds to the prevailing winds and hot climate creating a local appropriate response. The design of the station reinforces the need for the world to acknowledge the importance of architectural design in branding transport interchanges as important urban spaces, and spaces that can uplift the identity of the transport service and the area in which it is developed.

According to Nicholas Grimshaw the initial intention was to create a public space evoking nineteenth century traditions of transport engineering, although the end result is less nostalgic than this statement might suggest (Raisbeck, 2007: 52). The station breaks the shackles regarding the identity generally portrayed by train stations around the world- it redefines it. Generally perceived as tough, resilient places - resistant to pedestrian, rail and passing vehicle traffic's wear and tear, Southern Cross Stations shows that modern architecture does have its place in transport design. Vandalism and graffiti around today's railway stations are a bigger concern than ever before, and secure design that avoids opportunities for the unwanted to hide is needed. Grimshaw has achieved both by the simple method of utilizing glazing - a successful solution to both spray paint and darkness.

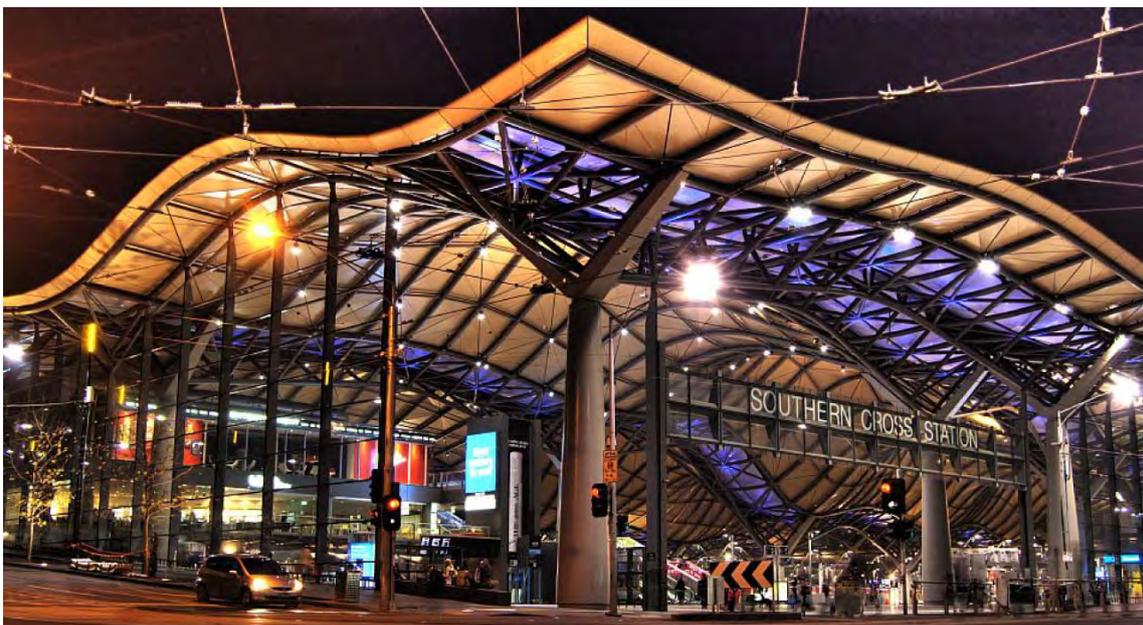


Figure 4.19- Southern Cross Station on the corner of Spencer Street and Collins Street (www.flickr.com)

#### 4.4 CONCLUSION

The precedent studies have confirmed the research covered in section 3.3.5 dealing with transport architecture and its inherent ability to portray the identity of a city and the industry itself. Despite the unique expression and identity of each of these buildings and their different geographical and climatic conditions it can be concluded that the reason why they are successful in terms of identity formulation is that they respond to their context, meet the needs of their users and are critical regionalist approaches in terms of the buildings relationship to the site. One can see from these studies that the synthesis between the building and its site is a vital factor in the development of a strong identity. Building scale and treatment of facades determines how well people will relate to it and function within it.

Some of the design guidelines set out by architects Gunther Wagner, Mokena Makeka and Tom Steer including the need for a transport building to become part of the 'memory fabric' of the city, safer and functional design, a balance between functionality and aesthetics, the vital role of context, the need for the building to be part of the urban fabric and the importance of designing for pedestrians and people first has been highlighted in both precedent studies.

Although both studies formulated identity in different ways - Roma Termini utilising classical Roman architecture with a mix of modernism and Southern Cross using imagery and iconism, they both related well to their contexts and created a strong identity with which the people could relate with. Both building became landmarks on the cityscape and created a positive identity towards the public transport sector encouraging persons from all socio-economic backgrounds to utilise the facilities available to them.

## **CHAPTER 5: CASE STUDIES**

### **5.1 INTRODUCTION**

Chapter 5 examines two South African case studies. It comprises of empirical studies of several facilities and areas in Gauteng. The interchanges in Gauteng deal with issues similar to those being tackled in this document. The case studies will offer valuable insight into the day to day running of transport facilities and through that various strengths and weaknesses will be addressed. These transport facilities have introduced a new architectural identity to the industry and represent a bright future. According to Gunther Wagner of Urban Solutions *"Transport facilities are some of the most 'public' of buildings within the cityscape. It is very much a portrayal of the identity of the city; the country's."* (Wagner, 2012)

The case studies will be analysed according to the following criteria:

1. Accommodation and Planning
2. Materials and Technology
3. Social Impact and Community
4. Users
5. Critical Regionalism
6. Architectural Identity

It must be clearly stated that the selected case studies are in locations and contexts vastly different to the proposed location and context of the site for this dissertation. The location and context of the case studies have none the less been analysed as these criteria are crucial to the success of any transport hub. The primary aim of this chapter is to analyse the case studies according to the criteria stated above.

#### **1. Accommodation and Planning**

Transport interchanges vary dramatically in terms of size, planning and accommodation. However there are similarities in terms of general accommodation requirements in order for the facility to function in an efficient way. There are also various ways of planning vehicle routes, ranking, holding, pick up points, and the connection between different transport modes. These elements will be analysed in the case studies and compared to come up with the most efficient system possible.

## **2. Materials and Technology**

Have the architects created a regional, South African architectural approach? Does the design show sympathy for a truly African vernacular, an architectural language that is the product of the local climate, geography, materials, culture and topography? The case studies will be analysed according to the criteria stipulated above which have been gained from the theoretical framework. Various similarities can be drawn between the climatic and geographic conditions of the two case studies and the proposed site for this dissertation. Therefore one can draw on passive design approaches taken and considerations for solar patterns which allow for the building to function efficiently within its landscape.

The construction system and materials selected will be examined in terms of their appropriateness, efficiency and resourcefulness. How do the materials relate to the immediate context? Taking into consideration the high levels of foot traffic through these building types, are the materials appropriate? Do the materials create a unique identity within the community? What are the construction methods used and how does that integrate into the overall concept? Material selection can be a vital tool used to contextualize the building and this will be evaluated in the case studies.

## **3. Users**

In order to give a critical analysis of the case study, one needs to analyse who the users of the facility are. Through the understanding of the social and cultural values of these individuals one can be critical as to the spaces that have been created and how they respond to the creation of an inclusive rather than exclusive environment, and in turn promote or prevent social interaction and the ability the building has to appeal to a wider socio-economic group.

## **4. Social Impact and Community**

Social interaction is one of the key factors of human nature and behaviour. It is important that individuals be allowed to freely associate with whom they please. Taking into consideration the effects of globalisation and vehicle technology, it can be deduced that transport forms an integral part of peoples everyday lives. Understanding this, one can begin to appreciate the potential that transport nodes possess in becoming social hubs. The potential for social interaction and the ability to develop social identity will be evaluated in these case studies.

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The case studies will also address how the architects have responded to the local community. Have the community been included in the design process in order to meet their direct needs and requirements? Have they allowed for local skills and craft to be used in the construction process to represent the true identity of the community? Have the architects engaged with the idea of creating public spaces, community benefits and facilities for community economic upliftment?

### **5. Architectural Identity**

When people arrive in cities the identity of the transport system and their facilities forms an integral part of the cities identity and the way it is perceived internationally. The essence of public transport facilities is that they should become the beacons of urbanity - the heartbeat of the cities they represent. The architectural identity of the various case studies will be analysed, and what impact they have on the identity of the public transport industry and the city as a whole.

## 5.2 METRO MALL MARKET AND TAXI RANK, NEWTOWN, JOHANNESBURG



### 5.2.1 Introduction

Taxis are the most popular mode of transport in all urban areas for the majority of South Africa's commuters, carrying 65% of all commuters in the country per day (Hansen, 2008: 46). More than 12 000 mini-bus taxis serve commuters to and from the outlying areas of Johannesburg. Until 2000, taxi operators were commonly housed in temporary structures, within left over space or on pavement edges (Hansen, 2008: 46). The taxi, had replaced the train and bus as the principle form of public transport and government needed to provide sufficient infrastructure to reflect its important standing within the urban realm. The project was undertaken by Urban Solutions Architects as part of a larger urban framework linking all urban renewal programmes within the Newtown precinct of Johannesburg CBD.

### 5.2.2 Justification for Study

Metro Mall sets the precedent in terms of large scale transport interchanges within a South African context and was the first of its kind developed in the country. It was groundbreaking as it integrated marginalized urban users, more specifically taxi operators and street traders, into the public realm, attempting to provide them with an architecture that represents them and that enables their endeavours bringing a sense of ownership, identity and pride.

### 5.2.3 Location

Metro Mall is located within the Newtown precinct of Johannesburg CBD, South Africa. It stretches over a site consisting of two land parcels of approximately 2.6 hectares, running between Bree Street on the south and Pim Street on the north. The two land parcels identified as 'B' and 'C', form part of the larger Metro Mall development framework, formalised in 1999. Included in the urban plan were facilities such as housing, public amenities and retail and commercial space (Deckler, 2006: 61). The site had over the past 20 years become a dilapidated urban wasteland. It was subsequently earmarked as an important sector of the inner city requiring regenerating to allow for a link to form between Braamfontein to the north and the Newtown Cultural Precinct to the south (Low, 2003: 41).

**REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct**



Figure 5.1- A macro image identifying metro mall within its broader context (www.googlemaps.com)



Figure 5.2- Site location identifying parcel 'B' and 'C' (Low, 2003:41)

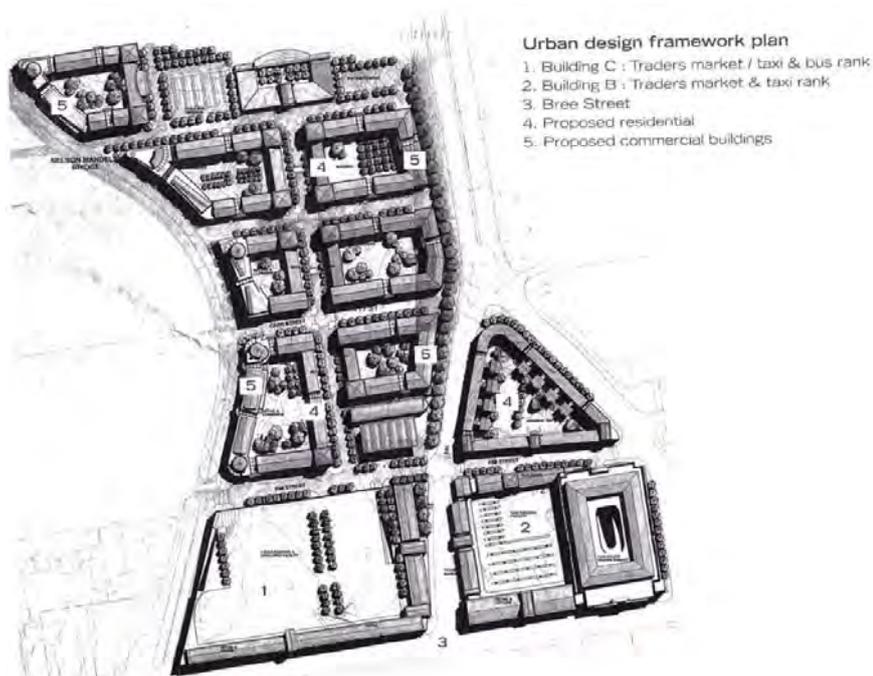


Figure 5.3- The greater urban design framework of the newtown precinct identifying the various nodes (Deckler, 2007: 63)

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## 5.2.4 Accommodation and Planning

Metro Mall is designed to provide:

- a rank for 25 busses serving 35 different routes
- holding facilities for 2000 taxis - with distinct areas allocated to the various operators and associations - and sufficient ranking and loading space
- 800 traders and retailers

Formal retailers, community amenities, crèches, recreation halls and transport association offices were also required (Deckler, 2006: 61).

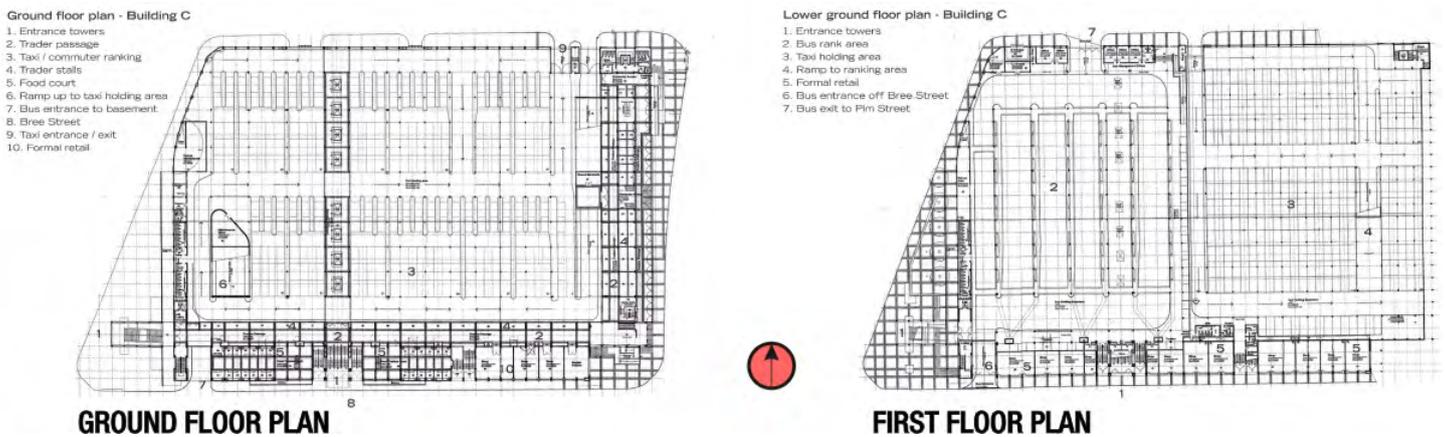


Figure 5.4- Floor plans of Metro Mall (Deckler 2006: 61)

Besides the specific requirements regarding numbers to be accommodated and the logistics of pedestrians and vehicles, the primary design concept of the Metro Mall development was based around urban principles for the development. This was to make connections to the surrounding city fabric and in doing so complete the street grid, enabling continuity of movement. It also looked at supporting public mobility across various transport modes; promoting mixed-use opportunities; observing street boundaries by creating active edges; and acknowledging the street as public space, allowing for freedom of access and movement (Low, 2003: 41).

As previously discussed the building is formed from two parts, namely land parcel 'B' and land parcel 'C'. They are split by Sauer Street.

Land parcel 'B' consists of the existing Kaserne parking garage which has been integrated into the scheme. This structure is primarily used for taxi-holding, with trade activity occurring along its ground floor edges. The western edge of the existing structure is used for

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taxi-loading as well as trader stalls, dining halls, recreation areas and transport association offices (Hansen, 2012).

Land parcel 'C' is a new structure all together. It accommodates similar functions to 'B' but on a larger scale and over three levels. It also caters for a bus rank, management offices, trader storage facilities, recreation and ablution facilities for taxi drivers and traders, offices for the various bus companies and for the Metropolitan Trading Company, who manage the complex (Hansen, 2012).

It is unfortunate to see that no facility for washing of vehicles was provided within the building. The parcel of land across Pim Street is used for vehicle washing. It is an eyesore to the entire urban development, strewn with litter and unsavoury smells. Having spoken with taxi drivers, they feel that washing areas should be provided within the facility as it is safer, cleaner, and provides cover when the weather turns. They also express their frustration at the area being used as a public parking lot.



Figure 5.5- Landparcel 'C' with the washing area in the foreground. (Author)

The vehicular movement within the facility has been designed to according to the "clockwise ranking" system. There is a clear system in place regarding holding and ranking. The holding areas are placed on higher levels with amenities for taxi drivers varying from sleeping areas to entertainment areas and ablutions. The ranking areas are placed on the ground floor to allow for ease of access for commuters. Picking up occurs in various rows that go to various destinations around Johannesburg. Drivers are called from the holding area when need be.

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Figure 5.6- Clearly marked destinations allow for easy navigation for commuters within the loading areas. (Author)

The trade spaces provided in the facility vary in size and arrangement to accommodate the range of needs. They range from small, simple floor space stalls with concrete counters to larger roller shuttered lock up cubicles and then fully serviced outlets to accommodate services such as hairdressing, fast food etc. (Hansen, 2012). Having spoken to traders operating out of the large stalls, they stated that they don't require additional storage space at night. The presence of security, they say, gives them peace of mind and have had no instances of goods being stolen.

Commuters are forced to pass the colourful trader stalls en route to their transport choice. The success of this planning intervention was evident when visiting the building. Traders are busy throughout the day, creating a hive of activity along the feeder routes. The economic outcomes for the traders are only positive, and it was suggested by the traders occupying existing stands that more of the same stalls are required to deal with the demands.

All building edges on the ground floor plane which back onto main streets are activated via formal retail stores or trading facilities. This maximises retail opportunities along these busy pedestrian routes and also allows for surveillance to occur, creating a safe and secure urban environment.

## REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct



Figure 5.7- Internal trade stalls are colour and vibrant and represent the identity of the trader. (Author)



Figure 5.8- External street edge retail stores. (Author)

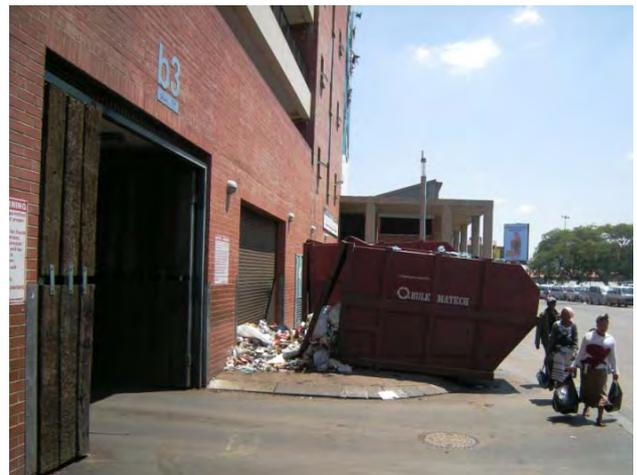


Figure 5.9- Ineffective waste management. (Author)

A key to the effective functioning of this building typology is a well worked service plan. Municipal wheelie bins are provided throughout the facility, but not adequately enough. Bins are overflowing directly adjacent to trading stalls creating an unpleasant environment. Waste is then transferred to a central skip, which formed part of no effective bin area. These skips are placed on the pavements, creating unpleasant odours and forcing pedestrians to walk on the road. At the time of analysis these skips were overflowing too. When taking into consideration the high amount of trade and turnover of goods that occurs within the facility, it is imperative that waste be dealt with adequately and effectively.

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### 5.2.5 Materials and Technology

The building is constructed in off-shutter concrete, steel and face brick. These materials are robust, durable and practical, and have managed to withstand the use of approximately 200 000 commuters per day.



Figure 5.10- Raw materials utilized throughout allow for a relatively maintenance free building. (Author)

Floor finishes vary from grano to polished concrete and brick pavers. The floors are easy to clean and sweep, and are durable taking into consideration the high levels of foot traffic within the building.



Figure 5.11- Internal floor finishes are practical and allow for easy cleaning. It is also important they are durable and able to deal with excessive foot traffic. (Author)



Figure 5.12- Protected edge detail on staircase.  
(Author)

All low level angle junctions have been reinforced and protected with steel angle edges to prevent brickwork or concrete from being chipped or damaged. It is important to note that all materials are in their raw state. This allows for a relatively maintenance free building, and one that can sustain itself over a long period of time.

A vibrant and South African nature has been captured in the facility, with artworks by local craftsmen adorning many of the walls, floors and benches.

Solar shading, orientation and building widths are well designed to optimize user comfort within the

building. The west facade has been dressed with a solar screen and temperatures in non-air-conditioned areas facing on to this facade are well controlled. Certain areas of the north facade have been equipped with overhead solar shading devices to prevent heat gain during hot summer days.

The design may be termed critical regionalist. It responds well to the site and climatic conditions common to its location. The building engages with the natural landscape utilising the slope of the land to introduce sub basement levels without any excavation required. Natural light is utilized well throughout the building and overhangs and screening devices have been provided to prevent excessive heat loading. Wind cowls have been placed on the roof, orientated to pick up prevailing winds on the site. This allows for a Venturi stack effect to occur where heat is drawn out through the roof and cool air is drawn in. This shows a clear engagement with the site and its prevailing conditions.

Taking into consideration the tight budgets provided for this building type, the architects have achieved a commendable result. Detail design is of a high quality and intricate thought has gone into ways of preserving vulnerable parts of the structure.

### **5.2.6 Users**

Users of Metro Mall are predominantly lower to middle income black citizens, who utilize the facility to get to job opportunities provided within the Johannesburg CBD. The buildings location means it severely lacks in its ability to link to existing transport facilities including





Figure 5.15- Courtyard spaces with natural light and ventilation provide a quiet setting away from the hive of activity occurring around it. (Author)

Public gathering spaces are provided for throughout the building. They provide quiet spaces off the trader routes where people can gather to interact, have a quiet meal or relax. The courtyard spaces are filled with benches, water fountains and sculptures covered by a canopy of trees and surrounded by cooking stalls. Various pause spaces in the form of mosaic bench seats are provided strategically adjacent entrance towers to promote social interaction along circulation routes.

### **5.2.8 Architectural Identity**

The most powerful element of the building is the entrance towers, which anchor the building to the site. The scale of the oversized entrances, according to Ludwig Hansen, previously of Urban Solutions, act as collection baskets, dominating the streetscape, drawing people in off the street to experience the hive of activity occurring within. They have been positioned at important street intersections and opposite existing movement routes to the commuter halls. They display and speak a language of celebration and power representing the identity of the functions within. The use of local craft and materials in creating the 'woven' effect on the towers begins to contribute towards the sense of an African identity. Rather than being applied onto the finished product in the form of a traditional motif, colour or pattern, the 'woven' effect is integrated into the design. Integration rather than application of art is vitally important so that it doesn't resort to merely an aesthetic void of meaning or authenticity.

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Figure 5.16- Playing on the concept of a basket, dappled light enters through the "woven" facade. (Author)



Figure 5.17- Externally the towers create a sense of arrival. The use of local craft evokes an African vernacular(Author)

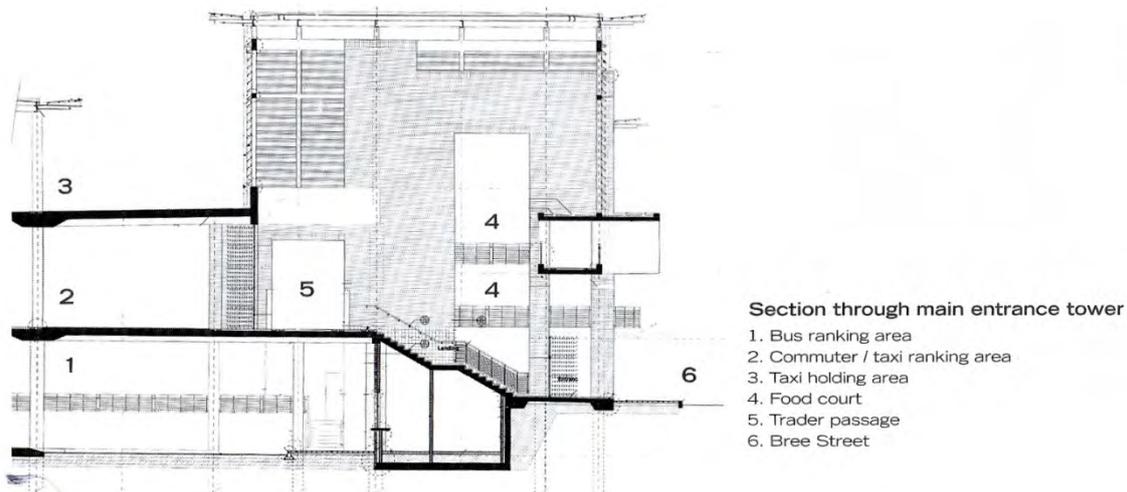


Figure 5.18- A section through the entrance tower showing the various activities. (Deckler, 2006: 63)

Distinct paths and edges have been created through the building, allowing for easy navigation for commuters. Nodes within the building are created and each one is unique allowing for the clear creation of mental maps. Various elements of Lynch's place theory are found in the building.

Hansen says that the design and emphasis of Metro Mall was driven initially from an urban design perspective, and thereafter from a planning one. He admits in retrospect that the architectural expression occurred without a clear concept in mind, with the final result being utilitarian, and possibly more serious than initially intended. This is evident in its outcome.

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An interesting concept incorporated into the urban design of the facility can be seen adjacent the taxi washing area on Pim Street. To deal with the level change from the washing area adjacent the main road and the pavement, architects have integrated a gabion wall reflecting the Johannesburg skyline. This is an innovative way of introducing an unmistakable local identity to the project, and something that all passer's by and commuters can relate with. It provides the building with a local appropriateness and roots it to its foundations within the CBD of Johannesburg.



Figure 5.19- A local identity introduced into an urban environment, creating local appropriateness. (Author)

### 5.2.9 Conclusion

The Metro Mall design indicates a significant shift in approach with dealing with public buildings that provide for a sector of our society that was previously overlooked (Hansen 2008: 46). It presents itself with pride and has a fantastic sense of arrival. This is in stark contrast to the stereotype of taxi ranks that we have become accustomed to, that we see dotted around our urban centres. It displays strength and permanence, rather than temporary and overlooked. Robust materials deal with the demand of its users; artwork by local artists adorn the interior walls and street landscape and activity along the street edge regenerates the immediate surroundings (Low, 2003: 41). The location of the building is questionable. Its inability to integrate into existing transport infrastructure means that the building acts in isolation and as a result does little to appeal to a wider commuter base. One feels the building was designed for an existing commuter and operator, which is not a negative aspect, but it feels like an opportunity has been lost to integrate new users.

### 5.3 PAN AFRICAN SHOPPING CENTRE AND TAXI RANK



#### 5.3.1 Introduction

The Pan African Shopping Centre and Taxi Rank was undertaken by Stefan Antoni Olmesdahl Truen Architects. The building is part of the Presidential Alexandra Renewal Project and is being developed by Africa DevCo, a development company established by Tebfin Developments in partnership with local entrepreneurs and the two main taxi associations in Alexandra (Matthes, 2009: 51).

It is the first fully integrated shopping mall and taxi facility developed by a public-private partnership of Gauteng Department of Housing, The Department of Public Transport, Roads and Works and The Department of Finance and Economic Affairs, The City of Johannesburg and the Pan African Development Company.

#### 5.3.2 Justification for Study

One of the most important aspects of a Transport Interchange is that the building does not become a 'destination in its own right'. It acts as the 'in between' medium- between routes, between modes of transport, between the departure point and arrival point. The transport interchange should rather look forward to the commuters final destination, thus acting as a gateway to the city and its surroundings. Alexander, 1997: 277, writes that a town is made up of many parts called precincts. A crucial point of any precinct is where you enter it. It is important that these entry points or gateways are distinctive in the environment. Just as Alexander says a gateway should have a feeling of transition, so should a transport interchange. The Pan African Shopping Centre and Taxi Rank acts as a gateway to Alexandra, sitting on the outskirts of the township along the main transport axes. Furthermore, the integration of high end materials and finishes, and the building being the first shopping centre/taxi rank of its kind in the country makes it relevant for study.

### **5.3.3 Location**

The Pan African Shopping Centre is located on the edge of Alexandra township, Johannesburg, in the heart of the area's iconic transport and retail node. Alexandra is a high-density township community located to the north-east of Johannesburg, and is one of the oldest townships in South Africa with a rich and turbulent social history. For almost its entire 105 years of existence Alexandra has been subjected to upheavals, social and physical disruptions and disconnection (Matthes, 2009: 53). Despite years of adversity, when similar locations were dismantled by the Apartheid government, Alexandra has proven to be a community determined to survive and thrive, full of colour, life and optimism.

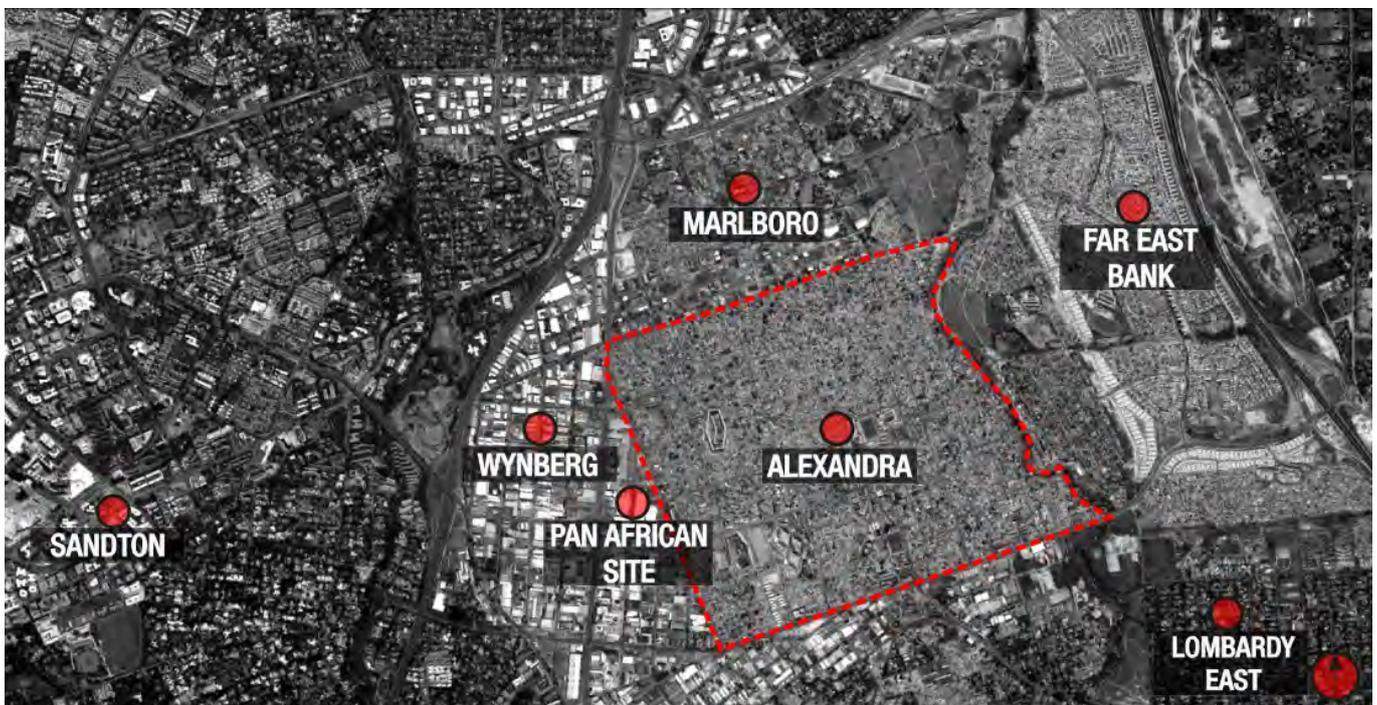


Figure 5.20- A macro image showing Alexandra township and its immediate context (www.googlemaps.com)

The site, historically a taxi rank, sits on the border between Alexandra township and the Wynberg industrial area. It stretches over two separate land parcels, namely block 'A' and block 'B' (Truen, 2012). The land parcels are separated by Third Street running down the centre. Third Street is the main axis running from North to South through the township, and all major modes of public transport run along this route. It is bounded by Second Street on the East and Watt Avenue to the South.

### 5.3.4 Accommodation and Planning

The Pan African Shopping Centre, built in 2009 is designed to provide:

- 16 000m<sup>2</sup> of retail space
- holding facilities for 800 taxis- with distinct areas allocated to the various operators and associations - and sufficient ranking and loading space
- trading stalls along Third Street and within the taxi rank

(Truen, 2009: 48)

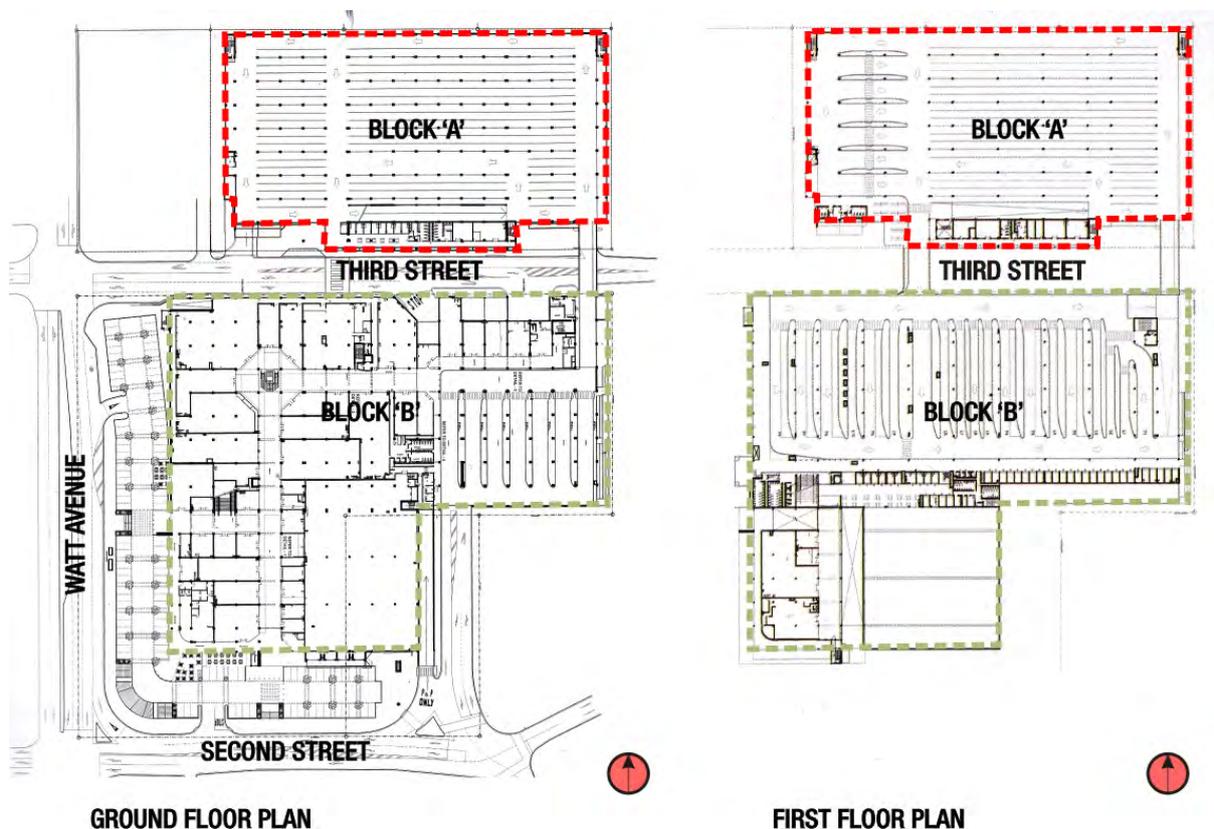


Figure 5.21- Floor Plans of Pan African Shopping Centre and Taxi Rank. (Truen, 2009: 49)

The building is formed from two parts, namely land parcel 'A' and land parcel 'B'. They are split by Third Street. By creating two separate buildings and linking them at a higher level the brief was met while still maintaining a fairly low mass.

The upper levels of block 'A' house the holding facility for short distance taxis, while the ground floor is assigned to long distance taxis, which connect Alexandra to other towns in South Africa. This building also contains administration facilities and ablutions for the taxi associations and its patrons, as well as workshops and washing spaces for ongoing maintenance of vehicles (Truen, 2012).

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Taxis either enter block 'A' from street level, via a controlled entrance on Third Street, or can connect at first floor level via a bridge on the northern edge from block 'B'. One in the holding area in block 'A', taxis can circulate up the ramped slabs, where they can cross the bridge on second floor level to return to Third Street. Here they enter the ranking space that sits over the shopping component.



Figure 5.22- The link bridge over Third Street connecting the holding area in block 'A' to the ranking space in block 'B'. (Author)

Block 'B' contains the retail component with its shops, mall space, service basement and the taxi rank on first floor. Commuters are forced to walk through the mall to get to the ranking space on first floor, promoting trade along these routes. Escalators are provided for ease of access onto first floor. The location of the rank directly adjacent to the retail component means that commuters can do their shopping and not have to walk long distances to their transport. The presence of anchor tenants such as Pick n Pay and various banks means that shoppers are exposed to conditions similar to those found in malls such as Sandton City and Rosebank Mall, with the added benefit of not having to travel vast distances to get there.

There is a large security presence throughout the shopping mall and this spills into the taxi rank too. Security cameras are provided throughout and this is all controlled via centre management on the first floor. It creates a sense of safety unlike what is experienced in the majority of transport facilities existing in South Africa at the present moment.

Smaller trading stores are provided for on first floor adjacent the ranking space promoting trade while commuters wait for the mode of transport. Each trading stall has its own DB

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board so electricity is charged separately, and an extractor and cooking unit is also provided. Traders operating out these stalls are excited at the idea of being part of a larger shopping experience and report good return of investment on their retail space. They are appreciative of the opportunity provided to them and say they are happy with the infrastructure provided.



Figure 5.23- Trading stalls activate the ranking area providing retail opportunities. (Author)

Trading stalls face onto the colonnaded walkway in block 'A' that runs along Third Street, activating the street edge. Christopher Alexander describes arcades as *"covered walkways at the edge of a building, which are partly inside, partly outside- play a vital role in the way that people interact with buildings"* (Alexander, 1977: 119). Arcades create an *"ambiguous territory"* (Alexander, 1977: 119) between the public and private realm. Streets need to be designed to create human comfort and by introducing elements such as pergolas, awnings and permanent roofs, one creates a liveable environment. They create unity in the streetscape and allow for people to traverse between activities safely.

One has to question why trade has not been catered for on the opposite edge of Third Street within block 'B'. As previously mentioned, Third Street is the primary route for all public transport, entering and exiting Alexandra and Wynberg. The opportunity to create passing trade while commuters wait for their preferred mode of transport to arrive has been lost. As a result the street edge of block 'B' is bland and does not address the pedestrian scale.

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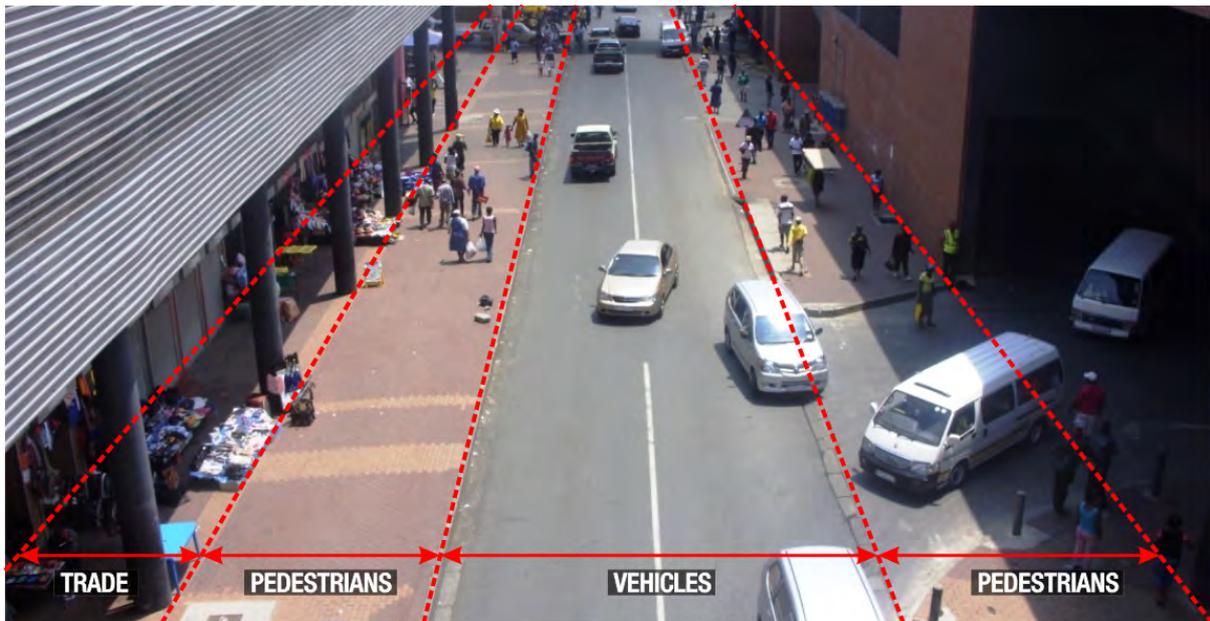


Figure 5.24- The colonnaded walkway of block 'A' on second avenue activating the street edge and the lack of activation on the opposite edge of block 'B'. (Author)

It was also noted through analysis at the care taken to set the building back from the site boundary, allowing for the urban design to accommodate a large pavement. This allows trade to spill out onto the pavement and still have enough space for commuters to sift through the variety of goods on sale as well as keeping a free space for thoroughfare. In some cases around the site traders have taken up both edges of the pavement, creating an arcaded walkway of their own to allow people to walk through. It is a fantastic example of providing space for trade to occur, defining zones on the street edge for different uses.



Figure 5.25- Clearly defined zones prevent conflict in activity. (Author)

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Off street parking, with planted trees, has been provided to allow private vehicles ease of access, with fast food outlets surrounding it. An amphitheatre has been created in the level change with the intent to create a space which allows for people to interact socially or eat foodstuffs. Unfortunately a fence surrounding the site has prevented this from taking place. It creates a barrier between the attractive retail space and the exterior urban fabric, preventing people from being able to stream into the site freely. Greg Truen says that the level change and fence were created to allow for controlled entry and exit points- *"Safety and security were of utmost importance in the clients mind."* This is the unfortunate reality in South Africa. Private land owners feel the need to create a secure perimeter in order to protect the functions within. As a result street traders, as much as they are accommodated for, are excluded from the development. One feels that a far more vibrant atmosphere could have been created if the street traders were integrated into the site at the expense of the car park.



Figure 5.26- The level change and fence prevent people from entering the site freely. (Author)

### 5.3.5 Materials and Technology

Mokena Makeka says that the key to an aesthetically pleasing transport facility is to balance functionality and aesthetics. *"We cannot have facilities with little or no aesthetic value because that affects the public perception of the industry and the facility and, therefore, the ability of people to use it and to want to linger there"* (Theunissen, 2009: 25). The objective

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is to therefore integrate technology, aesthetics and function. In line with putting people first there should be a continuous focus on choosing materials that are safe and consider the well being of the commuter. One feels that the Pan African Complex has achieved this balance.

The building uses a simple palette of tough materials. In addition to the taxi's that use the building each day, almost one million feet walk through the building each month (Truen 2012).

The facade detailing features a layering of different materials. This is achieved through part cladding of the street facades with translucent polycarbonate sheeting, which when backlit at night gives the building a layered depth with a luminous quality (Cornish, 2009: 9). The lightweight sheeting used also allows for a play with the robust, heavy nature of the rest of the materials.



Figure 5.27- A play between light and heavy materials was possible with the inclusion of translucent sheeting. (Author)

The interior of the mall has an impressive selection of materials. Large gloss floor tiles have been used throughout, with glazed shop fronts and detailed bulkheads. Signage can be found throughout, and its materials match the various bins and benches found around the mall, creating a sense of cohesion.

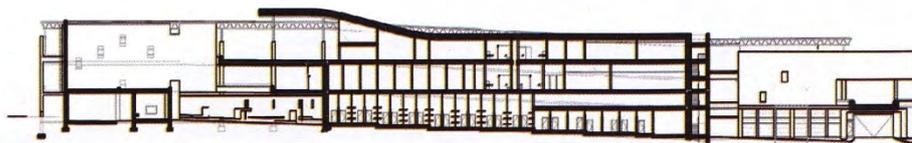
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Greg Truen says *"We realised we had to pitch the project at the level consistent with what consumers could experience in centres such as Sandton and Rosebank, and great emphasis was put on designing a shell with sophisticated finishes, plus a pleasing civic typology."*

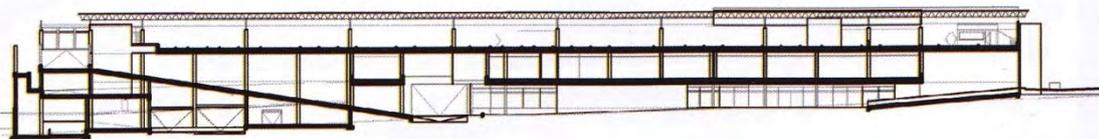


Figure 5.28- Sophisticated finishes within the mall are like those found in more upmarket areas of Johannesburg. (Author)

The design may be termed critical regionalist. It responds well to the site and climatic conditions common to its location. The building engages with the natural landscape utilising the slope of the land to create mezzanine levels where height allows. The architects used a simple steel technology for the roof structure. All roofs are single pitch, 'lean to' structures allowing for clerestory lighting to be utilized. This can be seen along the main, double volume walkways. This means that less artificial lighting is required. The position of the taxi rank on the one edge of the building means that the facade on that edge is open. This allows for natural cross ventilation to occur meaning that the reliance on a central air-conditioning system to cool the building is alleviated. The use of passive screening devices prevents excessive heat loading from occurring.



Section Block A



Section Block B

Figure 5.29- Sections through block 'A' and block 'B'. (Truen, 2009: 48)

### **5.3.6 Users**

The majority of users are lower to middle class black citizens who reside in Alexandra township or who work in the adjacent Wynberg industrial area. As a result of the buildings location, one could argue that it does little to redefine the social identities of the users, when considering it in a broader South African context. It does address social identity in Alexandra itself, but if anything the infrastructure provided promotes segregation to continue to occur. Although the architectural response redefines the typical apartheid style transport building, one questions its 'support' of apartheid planning. It does integrate previously marginalized users (taxis and informal traders) into the public realm but it could be argued that a township like Alexandra, in the greater scheme of things, is marginalized in itself. It is a direct product of the Group Areas Act and apartheid planning.

However, when one looks at it from a different perspective, it quite clearly creates a formalized gateway to not only Alexandra but Johannesburg itself. For the average Alexandra resident, the formalization of the taxi rank and the inclusion of retail outlets and anchor tenants, makes it a far more viable transport and retail option. It means residents no longer have to travel long distances to get to shopping opportunities. The provision of this infrastructure opens the world to some people who may never have experienced it otherwise

The architecture is effective in creating a 'sense of place'. It redefines the township landscape, but at the same time is well grounded. If one is successful in creating a sense of place then the building or precinct feels genuine and wholesome and not contrived. The product of this is that people feel better about using the space. This building has certainly achieved this.

### **5.3.7 Social Impact and Community**

According to Greg Truen of Stefan Antoni Olmesdahl Truen Architects (SAOTA), taxi associations were engaged as they needed to buy into the project. There was some engagement with the community when the original master planning was done but not when the architecture was done. *"There were so many competing interest groups with competing agendas that it wasn't really possible"*, says Truen.

Truen continues that they were very conscious of the building playing a kind of civic role and space was created around the building. A little amphitheatre was also created on the corner

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and it is used by the community. *"Last time I was there a street preacher had a little crowd going."* The shopping centre itself has created many jobs, including the cooking ladies who run food stalls up in the rank, and for local people who own stores or work in the stores.

Part of the construction contract required that the local community be used where possible so there was involvement in the construction of the project. This not only created job opportunities but allowed labourers to gain specific skill sets that would allow them to work on similar construction jobs in the future.



Figure 5.30- The view from the amphitheatre, overlooking the fast food outlets with seating flowing out onto the pavement. (Author)

Darlene Louw, deputy director of the Alexandra Renewal Project concludes, *"Pan African Shopping Centre has already created jobs, opportunities and sustainable businesses, and will continue to do so. It will improve the quality of life of the people of Alexandra and boost the local economy by attracting visitors to this exciting shopping landmark."*

### 5.3.8 Architectural Identity

Greg Truen states that the idea of the building as a gateway into Alexandra was important. *"We wanted it to stand out a little and differentiate itself as an important building but we also*

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wanted it to be very permeable so that it is very accessible to people on the street." The building stands out within the landscape adding to the 'memory fabric' of the area, as spoken about in Lynch's place theory where he defines it as 'mental maps'. It represents a landscape of transition. The building is bold and creates a new identity for the township of Alexandra- a new identity that they can relate to. It has become a centre in itself as a result of its successful integration with a public transport facility. Darlene Louw says *"Symbolising the freedom of choice, Pan African Shopping Centre is designed to be an important point of connection: public and private, resident and commuter, Alexandra and Africa, consumers and the items which meet their daily needs."*

### 5.3.9 Conclusion

The Pan African Shopping Centre and Taxi Rank represents a bold and significant step in integrating development within a previously marginalised urban periphery. The care taken by the architects to integrate all types of traders and user groups is commendable. The building stands out as an icon in the area, representing hope and change. As summed up by Tebogo Mogashoa of Pan African Development Company, *"Pan African Shopping Centre represents the dreams and aspirations of the Alexandra people. We developed it for them."*



Figure 5.31- The author with the traders- Pan African Shopping Complex was developed to create economic opportunities for informal traders and entrepreneurs. (Author)

## 5.4 CONCLUSION

The information obtained from the case studies will significantly impact the design of the proposed transport interchange. The following conclusions were drawn:

### **1. Accommodation and Planning**

From the case studies, one can conclude that the major element of a transport interchange is the ranking and holding space for busses. However, a vital space that should not be overlooked or undermined is that of trade- occurring in various shapes and sizes. It play a major part in the sustainable running of both facilities. The opportunities provided for traders should not be overlooked either. The economic and social identity impact it has on their lives and business sense it creates is like no other. Important aspects to take from the case studies too is that a well integrated vehicle flow plan needs to be incorporated. Taxi and bus owners and associations should be acknowledged and included in the design process to understand their exact requirements and what works best for them. In order to create architecture that speak of the identity of the public transport industry, then the public transport industry (commuters and operators) need to be involved in every aspect of its creation and expression.

### **2. Materials and Technology**

Materials need to be strong enough and of sufficient quality to withstand the high numbers of foot traffic occurring in these facilities. However the Pan African Shopping Centre and Taxi Rank shows that sophisticated finishes can be used in this building typology. They need not be raw and utilitarian as shown in the Metro Mall facility. Detail design is of utmost importance to preserve the material used as much as possible. Finishes should be relatively maintenance free to allow for the building to sustain itself over long periods of time. A key aspect in creating a locally appropriate response is its use of local materials and consideration for the climate and site conditions. Modern construction techniques, materials and processes need to be actively melded and tempered with locally available techniques and elements.

### **3. Users**

It is clear from the case studies that it is vitally important to create an inclusive rather than exclusive architectural response. The building should be all encompassing attracting people from a vast spectrum of socio-economic backgrounds. It is the opinion of the author that both case studies failed to do this. Location of the site is extremely important so that it is

accessible to all citizens. One cannot begin to redefine the identity of the public transport industry without creating meaningful, expressive spaces that interpret the culture, society and landscape.

#### **4. Social Impact and Community**

Both case studies show the importance of including the community in the construction process, not only to gain their insight into what is required and to get their approval of the design, but also to create job opportunities for individuals who can gain skill sets on site that they can keep with them for life. It is important the community have a sense of ownership of the product. Transport interchanges cannot be "*build it and they will come*" type projects.

Social spaces within transport facilities are of utmost importance. The case studies show how prevalent social interaction is in the industry, therefore creating spaces for social interaction to occur, and for social identities to be forged is a good design principle. The buildings represent a transition between various modes of transport and with the success of trade and fast foods stalls, spaces should be created for individuals to relax and meet en route to their destination. Architecture is a reflection of society through its configuration, therefore the spaces creates should be inviting to all citizens of society.

#### **5. Architectural Identity**

It is apparent from the findings of the case studies that not enough is being done by architects, through the communication of built form, to alter the identity and perception of public transport in South Africa, and in turn appeal to a wider socio-economic group. While these case studies are two out of many possible examples, they were selected as they were considered to be relevant to the findings of the theoretical discussion, and were seen as to represent a significant shift in mindset with regards to infrastructure provisions for the public transport sector in South Africa.

Having said that, the architectural identity portrayed in both case studies does represent a significant shift in the identity that the public transport industry portrays. The infrastructure provided is meaningful and sets new precedent in the post Apartheid South Africa. In the Metro Mall study one can see that the design team sought to elevate the status of informal building technologies as well as the integration of urban and rural building practise. The hand crafted 'weave' baskets that make up the entrance towers expresses a local identity and the author feels that the art found adorning the walls of the entrance towers, although applied,

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does have a deeper and more authentic meaning, particularly in its expression public transport and the elements that make up its overall identity.

The Pan African Shopping Centre and Taxi Rank represent a change in the design outcome of transport interchanges. A new material palette and sophisticated finishes similar to those seen in the international precedent studies, shows that transit spaces do not have to be low tech resolutions. However, identity cannot be positively reflected through the creation of an architectural expression devoid of meaning and authenticity. The mere application of new aesthetics devoid of any deeper meaning, does little to create an architecture that speaks of the people. One feels that the building needed to engage more with the social and cultural energies of the area and in turn would have been able to create more effective spaces, that would then begin to reflect an architectural expression rich in identity. Although community members were included in the design process and decision making, and local unskilled labourers were trained up, it is clear to the author that the integration of local craft and material is missing.

## CHAPTER 6: ETHEKWINI MUNICIPALITY - A QUANTITATIVE STUDY

### 6.1 INTRODUCTION

The eThekwini Municipality covers approximately 2300km<sup>2</sup> and is home to 3.58 million people (ITP, 2010: 11). The area extends from Tongaat in the north to Umkomaas in the south and from the coastline in the east to Cato Ridge in the west. The transport needs of these various communities is very diverse. The mix of cultures that inhabit the area and their past separation through the notorious Durban system that pre-empted apartheid influx laws, means that a cultural study is needed.

The eThekwini Integrated Transport Plan (ITP), released in 2010, is the most recent documentation that allows for an analysis of particular race groups during apartheid, and income groups after apartheid and their views on public transport. This study will help verify the current perception of public transport in eThekwini through a quantitative research approach.

### 6.2 ANALYSIS OF DATA

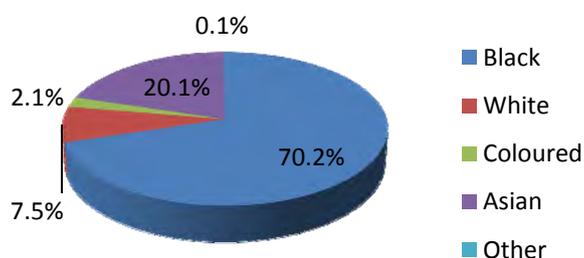


Figure 6.1- Population by race 2010 (ITP, 2010: 30)

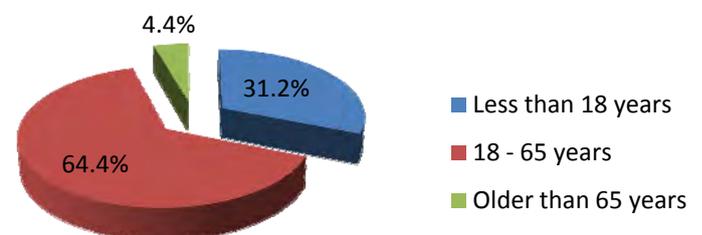


Figure 6.2- Population by age 2010 (ITP, 2010: 31)

According to the ITP, 2010, there are 904 100 households with 3 585 000 people, with an average household size of four, within the eThekwini municipal area (ITP, 2010: 30). The majority of the population are black, just over 70% of the total. Indians (20.1%) and whites (7.5%) make up the majority of the rest of the population. 52% are female, with 64.4% of the population being between the age of 18 and 25.

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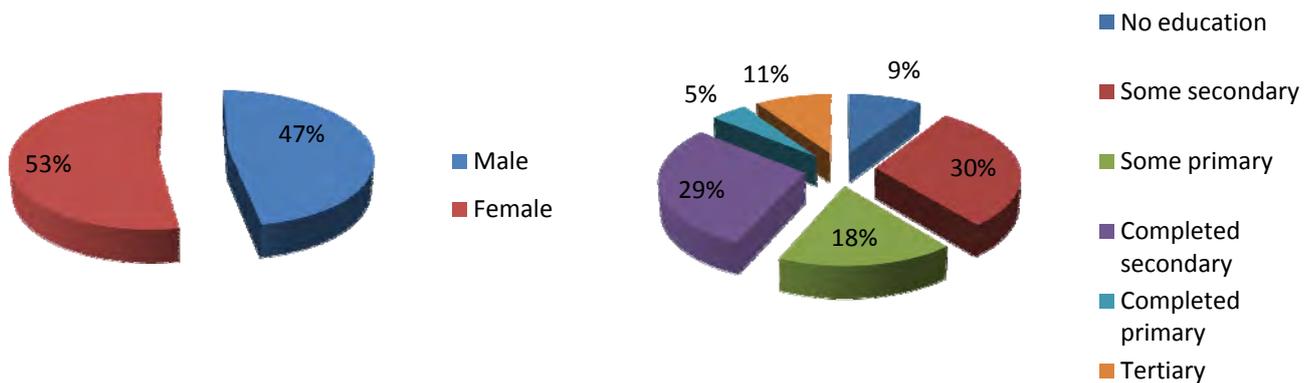


Figure 6.3- Population by sex 2010 (ITP, 2010: 32)

Figure 6.4- Population by education 2010 (ITP, 2010: 32)

The majority of the population have had some kind of schooling with only 9% having no education at all. However, only 29% have their Senior Certificates, and only 10% have any kind of tertiary education behind them.

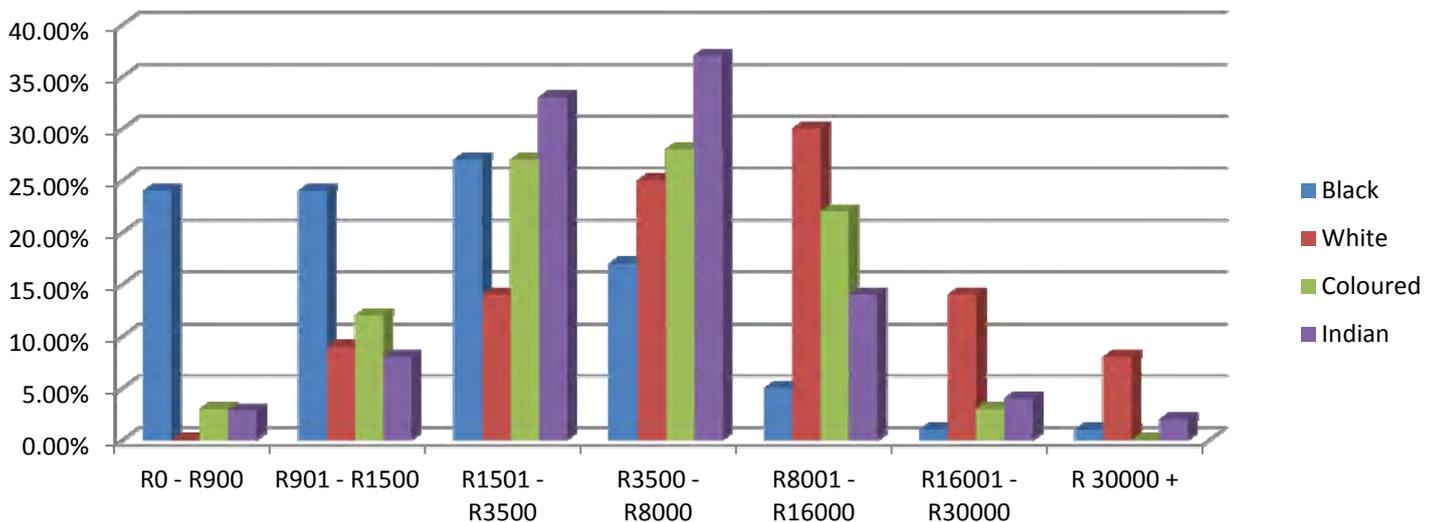


Figure 6.5- Monthly household income by race 2010 (ITP, 2010: 34)

The majority of the population earn between R1500 - R8000, however the segregation of the past can be seen by 24% of the black population earning between R0-R900, and 30% of the white population earning between R8000-R16000.

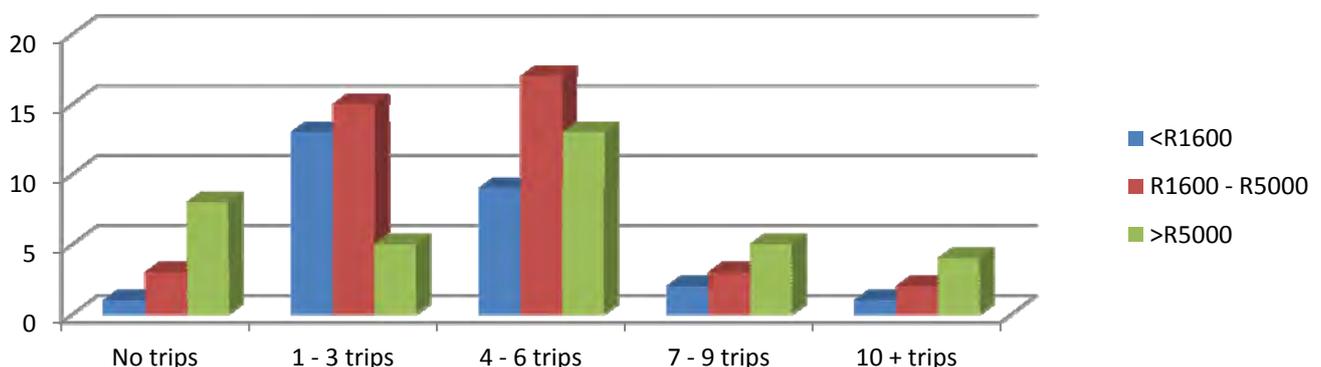


Figure 6.6- Daily trips by income level (ITP, 2010: 39)

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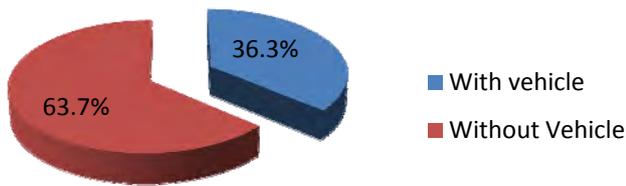


Figure 6.7- Households with access to private vehicles 2010 (ITP, 2010: 35)

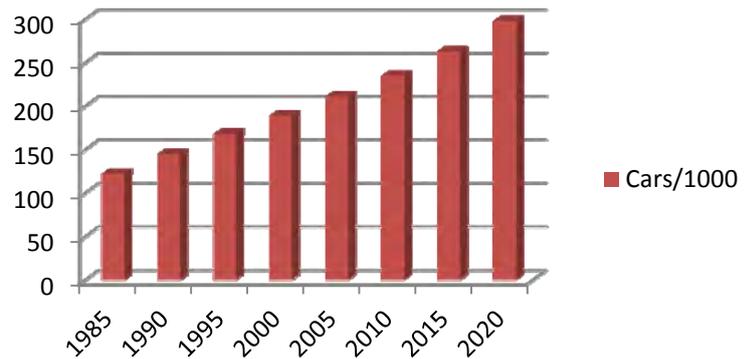


Figure 6.8- Projected number of cars/1000 inhabitants (Public Transport Plan, 2005: 45)

Only 36% of the current population have access to private vehicles, which bodes well for issues surrounding sustainability, congestion etc, however the Public Transport Plan for 2005 sees the number of persons that have private vehicles constantly rising by 20 cars/1000 inhabitants per year.

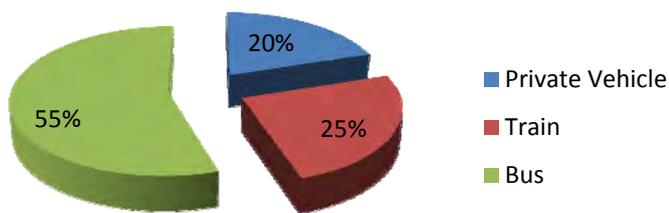


Figure 6.9- Population by Transport Method 1969: Non-White (De Leuw et al, 1969)

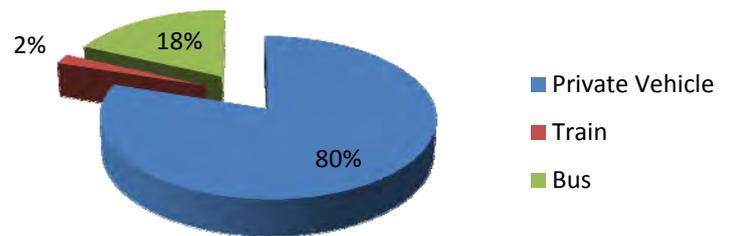


Figure 6.10- Population by Transport Method 1969: White (De Leuw et al, 1969)

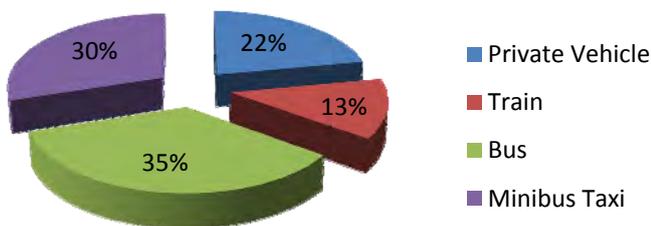


Figure 6.11- Population by Transport Method 1999: Low Income (De Leuw et al, 1969)

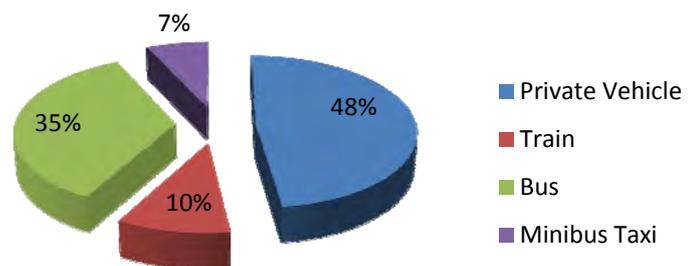


Figure 6.12- Population by Transport Method 1999: High Income (www.transport.gov.za)

One can see the decline in the use of public transport by the white community as far back as 1969 with 80% of whites using private transport. The bus constituted for 55% of the non-white population. However by 1999, one can see the rise of the minibus taxi, constituting for 30% of the total trips taken by low income earners.

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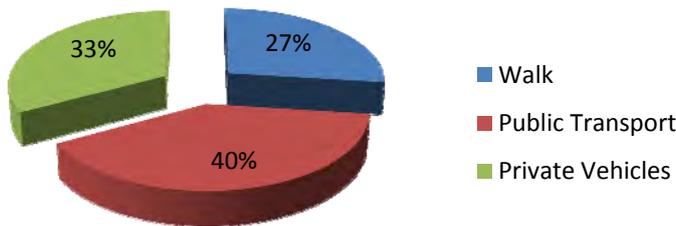


Figure 6.13- Population by Transport Method 2010 (ITP, 2010: 36)

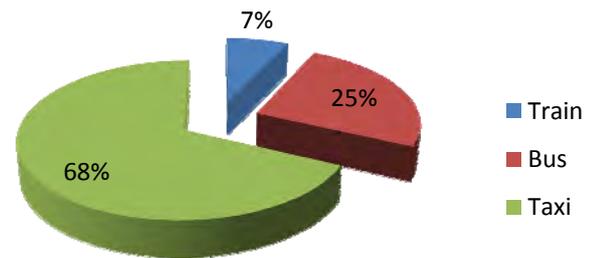


Figure 6.14- Population by Public Transport Method, 2010 (ITP, 2010: 38)

By 2010, 68% of all trips taken on public transport were via the minibus taxi. 40% of the total population utilize public transport, with 27% walking and only 33% using cars.

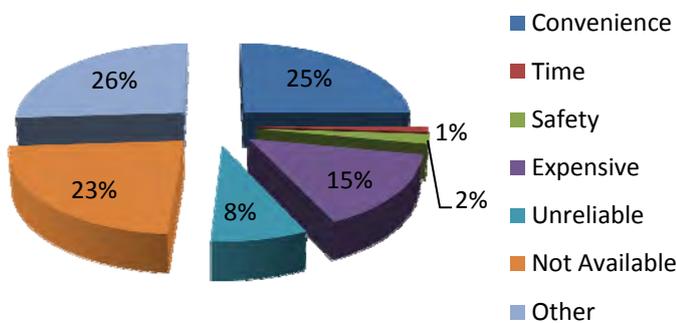


Figure 6.15- Reasons for not using Public Transport 1999: Low Income (www.transport.gov.za)

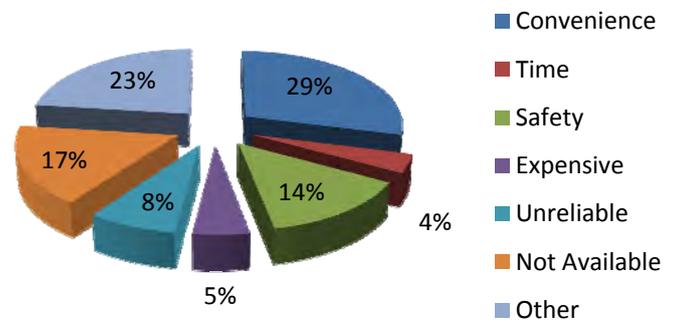


Figure 6.16- Reasons for not using Public Transport 1999: High Income (www.transport.gov.za)

Reasons for not using public transport vary between low and high income brackets, however common denominators such as lack of availability, reliability and convenience are prevalent. 15% of the lower income levels see expense as a reason for not catching public transport which probably explains the high levels of people that walk. Only 5% of the high income population blame expense for not using public transport, with 29% seeing convenience as an issue and 14% saying it is too dangerous.

### 6.3 CONCLUSION

However positive the improvements in current transport infrastructure may be, it has been discovered that South Africa and the eThekweni Municipality are still haunted by the effects of apartheid and as a result we have a segregated community, with sprawling urban areas. People's perception of public transport is rooted in apartheid and this is affecting the possibility of the success of the system.

## **CHAPTER 7: CONCLUSION AND RECOMMENDATIONS**

### **7.1 INTRODUCTION**

This chapter is a culmination of the data collected throughout the research process. The primary aim of the research was to explore the concept of architecture as a catalytic instrument in the creation, and identification of identity, and how this can be applied to begin to redefine the identity of the public transport industry in South Africa, and in turn appeal to a wider socio-economic group. The purpose of this chapter is to summarize the findings, outline the conclusions reached in terms of the intended aims and research hypothesis and present problems encountered with viable recommendations.

### **7.2 SUMMARY OF FINDINGS**

This study has covered a range of theories and concepts surrounding the formulation of identity and the reflection of identity through architectural expression and spatial configuration and articulation. The research findings provide comprehensive literature regarding the problems stated in this dissertation. The objective was to source these problems and find possible solutions by conducting thorough studies on theories related to architecture. This created a contextual and critical understanding of these issues.

The literature review on identity set out to trace the historical developments regarding the concept of identity, through the work of Stuart Hall and Paul Taylor, and how this was related to and reflected in architectural discourse. It was discovered that the path of development regarding the concept of identity, from the fixed, the flexible and the fluid can be seen and analysed in a similar manner in architecture, by means of a method used by Majhamahle Mthethwa, through the analysis of cultural connectivity.

The initial discussion looked at identity being fixed, through the use of local architecture, as discussed in the work of Paul Oliver, which used rationality and formality as a basis for their designs. Following from that, post-modern approaches were looked at where the local traditions were synthesised with modernism (Critical Regionalism), allowing for more flexible and playful design forms.

Local architecture, as discussed, became the precedent upon which architects based their designs in seeking for local or regional appropriateness and identity. Place-centred identity construction was first explored here. The approach to architectural designs related to cultural

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connectivity, as in local architecture, was criticized by advocates of Critical Regionalism such as Kenneth Frampton and the Greek Architects Alexander Tzonis and Liane Lefaivre. Critical Regionalism still addressed issues of local appropriateness, but went beyond that by proposing a design approach based on structural elements of the local context, without becoming entangled with the local architecture.

However Critical Regionalism also had its shortfalls, as discussed by Tzonis and Lefaivre. It failed to effectively create a *genius loci* or 'sense of place'. To investigate the question of *genius loci*, with respect to identity and local appropriateness, public architecture and its ability to reflect national identity was looked at through the work of Lawrence Vale. It was deduced that it can be extremely difficult to design a building that represents a nation, as people and groups perceive things differently. This perception could lead to rejection or misuse of a particular building. As a result a building should be abstracted, but not too far as to become culturally neutral. It is a fine balance that architects have to deal with.

The literature review on transport was tackled through the analysis of global and local issues. The first section set out to identify global issues surrounding urban transportation. It identified the essential components of sustainable urban transportation systems with the term 'pillar' has been used for good reason. The aim was to understand that all four pillars are necessary for sustainable urban transportation to be achieved: all have to be well established in order for cities to develop in a sustainable fashion. For example, fixed rail urban transit systems have the potential to make cities more environmentally sustainable, but unless they are supported with effective land-use policy, then transit systems might be financially unsustainable. Conversely, establishing a neo-traditional neighbourhood in a sea of suburban sprawl may do little to promote transport by sustainable modes. The necessary investments in sustainable infrastructure systems cannot be made without suitable funding mechanisms. Without suitable regional governance, it is hard to see how either integrated land use planning or sustainable funding mechanisms can be achieved. Sustainable urban transportation arguably requires all four pillars.

Following from that the issues surrounding the age of the automobile and its possible alternatives was addressed. What was gathered is that the problem is not the car per se, but rather that the system of auto mobility locks into itself its own justification, norms and expectations, which means that most individuals are unable to conceive solutions to their own mobility issues. To bring about the changes requires the user to unlock themselves from car

dependence and present a visible challenge to social norms. As suggested above the car is only part of the problem. Real sustainable transport patterns require comprehensive and connected strategies that will transform mobility patterns. Litman (1999) says that people require a 'paradigm shift'. Cox (2010) concludes that institutional changes need to be made in order to support changes for sustainable mobility (Cox, 2010: 66).

The final portion dealing with global issues investigated trends that have begun to develop in transport interchange facilities and these should be understood before making new suggestions. The transport interchange is a relatively new building typology, with relevant examples being analyzed in chapter 5. The study into transport in the urban context reveals the importance of a well developed brief prior to any transport related project. The immediate urban context is an important consideration as well as economic, environmental and social impacts.

A critical review of transport related development in South Africa, provided evidence that major initiatives are being rolled out to improve public transport in the country. The process is ongoing and will possibly continue to be over the next fifteen years. At present each mode of public transport is being dealt with individually, which can result in sub-optimal transport systems in the main urban and metropolitan areas. One of the challenges is to integrate the various transport sectors so that they all can focus on achieving a similar goal - a seamless public transport service across all transport areas.

However positive the improvements may be, it was discovered that South Africa and the eThekweni Municipality are still haunted by the effects of apartheid and as a result we have a segregated community, with sprawling urban areas. People's perception of public transport is rooted in apartheid and this is affecting the possibility of the success of the system. Through the investigation of identity in transport architecture in South Africa, it is possible to conclude that opportunities have, in the past, been lost when providing architectural interventions for the public transport system. Various architects agree that public transport interchanges are the heart beat of a city and as a result can reflect the identity of not only the industry itself, but the city too.

### 7.3 RECOMMENDATIONS

The main research question was to understand what the appropriate architecture for the design of a modal interchange in Kwa-Zulu Natal is, that can work toward and redefine the identity of public transport, and in turn be appealing to a wider socio-economic group. Design recommendations have been provided and are based on conclusions drawn from the literature review, theoretical background, precedent studies and case studies. They are a set of recommended principles and guidelines for the design of a modal interchange in South Africa.

It is recommended that architects and planners use the power of architecture and the identity it portrays to positively shape societies and the environments in which they live, and in doing so continue to eradicate the issues surrounding South Africa's segregated and oppressive past. The architecture should aim to undo the old spatial order and heal the wounds of the past, so as to render public transport accessible and safe.

One must realise that all individuals have different perceptions of the built environment. Everyone sees and perceives the world around them through their own lenses, basing their opinions and judgements on what they see rather than what they know, often leading to uninformed conclusions and decisions. Individuals should centre their interest on the expressive role of architecture rather than on its aesthetic, structural or functional aspects. Expressive and relevant architecture should respond to and convey the complex identity that characterizes South African society. However, when attempting to portray identity in a heterogeneous society that we find ourselves, there is a danger of, in an attempt not to design for specific groups of society, to design for none of them at all. Rather a balance is required, a kind of abstraction. Yet if a building is too far abstracted from any reference point, it becomes culturally neutral, and may be resisted, resented, or even ignored. According to Marschall and Kearney (2000: 154), "*...the challenge is to abstract in a way that contributes to the existing nation that builds upon what is there without exacerbating interethnic tensions. The task is to develop a rich ambiguity, so that the building neither seems to serve one function nor seems so neutral that it may exist anywhere.*" (Marschall & Kearney, 2000: 154).

Both case studies highlighted the need for some sort of community involvement in the construction process in order to develop and strengthen local identity. In order to create architecture that speaks of the identity of a people, then the people must be involved in every

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aspect of its creation and expression. Successful architecture is that which relates to the context of that society and expresses the identity of all who constitute it. This can be done in various ways including:

- involving them in the planning process
- understanding their needs and requirements from the particular design
- seeking their approval of the design
- involving them in the construction process through the employment of unskilled labour
- commission local artists to design pieces to adorn the facility. These elements must, however be integrated into the design rather than just being applied to the finished product. One cannot merely create a South African ambience that is void of any deeper meaning or authenticity.

If local communities are made aware of and involved in the design of a public transport interchange, it will allow for the development to be accepted easier by the community as it would represent the identity of that particular group and will promote the use of the system, as the community's needs would have been at the forefront of the designers minds.

The research has shown how identity can be reflected in the built environment, in order for the people who live in those environments to connect with them. This can be done in various ways including:

- respond to the positive elements of the area
- reflect the collective identity of the community, but also allowing for the celebration and expression of individual identities (integration of artwork and design)
- being all inclusive and accessible to all individuals
- being adaptable to change within a heterogeneous society, allowing for the building to continue to represent the community regardless of the circumstances
- respond to the unique context and site conditions
- utilizing locally appropriate materials and construction methods.

The modal interchange is a fairly new building typology in South Africa. The research has shown that in South Africa there is very little documentation or specifications in place in terms of requirements for new public transport design in a local context. There is no best practise or benchmark. However one can look to international best practise and apply the

precedent set there to a local context, without the outcome being Eurocentric. The following design and site selection guidelines are based on extensive research done on modal interchanges and an interviews with various professionals including Andrew Marsay (Ex head of the transport planning division at Arup, principal planner of The Gautrain Initiative), and are recommended for a modal interchange facility in a South African context. The focus is to offer suggestions with regard to the nature of the various attributes that make up this type of facility. The guidelines offer a broad overview and one must understand that the actual constituents suggested may vary from one project to another. It is strongly suggested that empirical studies of the specific site and location be done to support the design decisions made.

The objectives of the guidelines and recommendations are as follows:

- Develop a practical guide for the process of designing facilities
- Establishing an approach towards public transport interchange design which considers it in its total urban context
- Learn from the performance of recently constructed facilities, to build on positive, and learn from negative experiences
- Focus on the needs of pedestrians as the basic functioning component at public transport interchanges.

### **7.3.1 The Nature of Transport Interchanges**

#### **The Urban Meaning of Interchanges**

Transport interchanges are important elements of the built environment and need to be used intelligently to improve the performance of the city. From a design perspective, they have a number of characteristics which need to inform their conceptualization:

- They are **people places**: significant places of gathering and the generation of pedestrian flows
- They are **places of waiting**: comfort is therefore a critical design issue

They are **places of mode transition**: people need to change direction and transport mode quickly and easily. When this is achieved people will have access to a wider range of urban opportunities.

### **The Relationship of Interchanges with the Built Environment**

As a result of interchanges generating flows of people and traffic, they have strong generative qualities (see section 3.3.4). They have the ability to attract or repel activities. As a general principle, interchanges should:

- always be located in places of high accessibility
- always be associated with public space
- be considered good locations for public facilities
- make provision for informal trading and markets
- be reinforced by high density housing promoting walkability (see section 3.2.2)
- be associated with facilities of convenience (cafe's, ablutions, ATM's)
- be places of human safety, security and comfort.

Transport interchanges should only be viewed as a form of movement infrastructure, but rather catalysts to future development, the emergence of vibrant, urban modes and as important elements of place making.

### **7.3.2 Overall Design Pragmatics and Approach**

Four sets of requirements need to be addressed in the design of transport interchanges:

- The totality of the pedestrian experience. Central to this is capturing the performance qualities of: safety and security, comfort, convenience and dignity
- Efficiency of vehicular movement, stacking and holding
- Urban integration: the way in which the interchange is integrated with its urban surroundings, capitalization of potentials and minimization of negative impacts
- Integration of the various elements and activities: interchanges comprise of a complex network of activities which need to be brought into a harmonious whole. Holistic and creative thinking is required.

### **7.3.3 Planning, Transport and Urban Design Principles**

#### **Planning Principles:**

- Sustainability
- Variety
- Robustness

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- Urban Structure
- Pedestrians Primary
- Activity Patterns
- Interchange Management
- Consultation with Community and Role Players

### **Transportation Principles:**

- Function and Role
- Total travel experience
- Range of Public Transport Modes
- Access to the greatest number of people
- Supply of and demand for facilities
- Flexibility to change in operating environments
- Self-enforcement design

### **Urban Design Principles:**

- Place-making
- Integration
- Urban revitalization
- Permeability
- Legibility
- Local appropriateness
- Richness
- Robustness
- Safety
- Universal access
- Common theme and language

### **7.3.4 Urban Design Guidelines**

#### **Facility Integration**

Integrate the facility to the maximum degree possible to existing movement, urban activities and spatial and path systems. It is important to not attempt to create new routes. Designers

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must acknowledge that routes have been formed organically over time to meet the users requirements. It is important that designers analyze these various routes through Space Syntax or similar to understand major and minor axes.

### **Clear Boundary Definition**

Promote and provide clear built and/or planted edges to the precinct space which will allow for the interchange to be incorporated into the urban fabric. Existing edges need to be reinforced and new ones created. Defining these areas will help to create an easily readable system allowing for people to navigate the urban area easily and safely.

### **Space Defining Elements**

The use of existing buildings, roof shelters, colonnaded arcades, tree alignments, low walls, street lights, or a combination thereof, can create defined space and/or system of spaces.

### **Accentuating Arrival Points**

It is important to accentuate points of entry to allow for a sense of arrival and gateway expression. Textured pavements and paved thresholds across the access routes at the entry points can promote this. Structured pedestrian crossings could coincide with these thresholds.

### **7.3.5 Design Principles**

#### **Modal Priority Access**

The most prominent location on the site should be given to the most efficient and sustainable modes of transport. Pedestrians and cyclists should have the most direct access to the interchange, while park and ride, which, based on the cost of provision of space, should be given the lowest priority.

Generally the preferred order of priority in interchange development is:

- pedestrian/bicycle
- bus
- taxi
- rail
- drop off and pick up
- park and ride

### **Separation of Travel Modes**

Separation between pedestrians, cyclists, busses, taxis and cars improves safety and efficiency. the segregation of different types of mode within the interchange can also help reduce potential conflict points. There should be designated entrances and exits to the interchange for the various modes, particularly busses and taxis.

Where points of conflicts between pedestrians and vehicles do occur, clearly marked crossing points should be available. Separation of arriving and departing pedestrians will maximise the efficiency of the interchange.

### **Modal Integration - Ease of Transfer**

It is clear through the research that time spent waiting and transferring between modes is one of the main reasons why people do not use public transport (see section 3.3.6). All aspects of the interchange, including connection and waiting areas need to be geared towards convenience. passenger comfort needs to be designed for in order to retain and enhance the current pool of public transport users.

### **Transit Oriented Development Outcomes**

Public transport facilities should integrate with the surrounding activities and circulation networks. The development within a one kilometre radius should support the principles of Transit Orientated Development (see section 3.2.2). This includes commercial or residential developments which increase employment or residential densities and promotes walkability. The close proximities of residential developments will also aid in creating passive surveillance or eyes-on-the-street.

Ways in which TOD can be encouraged include:

- mixing commercial, retail and residential density to take advantage of increased accessibility and support a high level of transport usage
- improving pedestrian and cycle access to adjoining land uses
- reducing the need for on-site parking in residential and commercial developments to increase density and minimize places for loitering.

## **Legibility**

Legibility is extremely important as it adds to the overall comfort for users. Where there is an expected growth in commuters, many of them will be first time users. They should be able to navigate themselves easily around the interchange without getting lost or feeling unsafe. Common destination and pick up points, clear and uncomplicated transport paths and way finding an information signage add to the legibility.

## **User Requirements**

Critical issues for users of public transport include:

- security and safety
- punctual services
- well maintained and clean facilities
- a pleasant and comfortable environment
- clear services and timetable information
- way finding and directional signage

Changing between various transport modes requires:

- clear lines of sight and movement
- ease of transfer between modes, including lifts, ramps, escalators etc
- clear way finding signage
- clear and consistent information regarding services

### **7.3.6 Planning For Transport Modes**

#### **Rail**

Quite often transport interchanges are developed around existing railway stations and therefore a cohesive approach is required to station precinct development. Key issues that should be addressed in order to meet patronage growth as a result of redevelopment include:

- getting more passengers efficiently to stations located in congested areas
- diversity of station access across modes to meet patronage growth an access capacity to stations

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- recognition that passenger growth will be derived from locations beyond the one kilometre development radius
- development of strategies to increase the capacity of station access modes
- development of strategies to accommodate station access patronage growth outside peak hours

### **Pedestrians (Walking)**

Walking is considered both an access mode to a transport interchange and a component of a total journey (see section 3.2.3). One must remember that a journey does not originate at a transport interchange, but rather at the commuters place of residence. Effective way finding signage, lighting and surveillance from adjacent streets, safe pavements and suitable crossings should not only be provided for in the direct precinct, but rather, if budget allows, be provided for within a one kilometre catchment radius.

Planning within the interchange should incorporate the following principles:

- separation between passengers and vehicles
- clearly defined public access routes
- focussed pedestrian movements to defined crossing points to minimise pedestrian and vehicular conflict

These principles can be achieved by:

- using bollards, landscaping or kerbing
- planting and patterns in the paving that reinforce pedestrian circulation routes
- safe and attractive pedestrian access provided by widened pavements, increased lighting, provision of shade and shelter
- designing direct and unobstructed routes
- configuring the layout to favour the highest volume of users

### **Cycling**

The implementation of local bicycle plans and cycle networks will increase the number of passengers arriving at transport interchanges by bicycle (see section 3.2.3). Cycle access plans for the catchment areas should be developed in conjunction with traffic authorities

during the planning and development of transport interchanges to ensure cycle access is addressed. The following measures are recommended for the inclusion of cycling:

- safe and secure cycle access paths or lanes
- secure bicycle storage, such as bike lockers and/or bike racks
- a bicycle hire/repair store within the immediate precinct or interchange itself

### **Bus**

The efficient running of bus services is of top priority to bus operators. Delays must be kept down to an absolute minimum as even small delays, when compounded may increase operating costs exponentially. Busses are an affordable means of transport that cover a large catchment area for the facility. Dedicated bus circulation may often prove to be cost effective in the long run and the layout of the facility must be designed to absorb a certain degree of backlogging of busses.

### **Taxi**

Taxis circulation must be orientated so that the correct side (left hand side of vehicle) faces the kerb for loading and offloading. The taxi areas should be separated from bus areas and should be fully integrated with the stacking areas. The number of taxis will be far greater than that of busses in a local, South African context. Taxi areas should be divided into holding, stacking and loading segments. The possibility of integrating taxi wash areas and drivers ablutions should also be considered.

### **Drop Off and Pick Up**

Transport interchanges should locate opportunities for drop off and pick up facilities close to or adjacent major entry points. Features should include:

- shelters, seating and lighting
- drop off and pick up areas clearly indicated
- bus and taxi areas should not be interrupted by drop off and pick up waiting zones

### **Park and Ride**

Park and ride parking does not require prime position within a transport interchange. It is extremely important, however, that commuters are able to transfer from their private vehicle to various public transport modes with minimal fuss and time wastage. Park and ride is often

seen as the transition or "meeting half way" phase between a commuter being completely reliant on private vehicles, to becoming a public transport patron. In no way should these parking areas be designed in a blasé fashion. They should add to the overall commuter experience. Desirable features of car parks include:

- located close to adjoining streets or land uses to maximise passive surveillance
- pedestrian access routes to and from the parking should be well lit and monitored by security surveillance

### **7.3.7 Passenger and Staff Facilities**

#### **Passenger Facilities**

Adequate and comfortable seating should be provided in waiting areas and should be designed in such a way to discourage sleeping.

Toilets should be provided to deal with peak hour commuter numbers. Passenger toilets should include disabled facilities.

Weather protection is desirable over all concourse and platform areas, pedestrian paths and waiting areas. Wind barriers should be provided through the implementation of double doors or similar solutions, but should not impede the flow of commuters.

#### **Staff Facilities**

Transport interchanges could be a terminus for bus and taxi routes, therefore facilities should be provided for relaxation, refreshment and entertainment. This could include ablutions with showers, lounges, meal rooms, lockers and games rooms

### **7.3.8 Safety and Security**

Interchange design should maximise actual and perceived safety. Where appropriate, the following elements should be incorporated:

- CCTV in operational areas
- Adequate lighting
- Capacity to communicate between control areas
- Visual monitoring

## **REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct**

- Passive surveillance by incorporating commercial or retail facilities within the interchange

Crime Prevention Through Environmental Design (CPTED) is the application of design and built environment techniques to reduce crime and improve quality of life (Marsay, 2012). The primary concept of CPTED is that anti-social behaviours such as vandalism, theft, burglary and assault only occur when the opportunity exists for individuals to engage in them (Marsay, 2012).

Recommended CPTED applications include:

- maximising the use of transparent materials in facades (see section 4.3)
- in places where visibility is priority for safety, keep foliage and other visual obstructions down to a minimum
- locate independent feeder bus stops near existing points of activity such as convenience stores or petrol stations
- maximise the use of the facility 24 hours a day to allow for constant passive surveillance
- avoid creating dead spaces where people can loiter

## 7.4 CONCLUSION

The research set out to support the initial hypothesis, which for the benefit of the readers is restated:

A well informed, expressive and meaningful architectural approach for a transport interchange may directly affect the public's perception and begin to redefine the identity of the service.

The theoretical information gained supports the hypothesis posed. It has been found that architecture is an extremely powerful medium in which to portray identity, but one that is severely underutilized. Architecture's power to represent, project a specific image, and be associated with a particular culture or group has been realized. The research has shown how identity must be reflected in the built environment in order for people who inhabit those environments to connect to them.

Through the investigation it can be deduced that the circumstances that led up to the current perception of public transport in South Africa is deeply rooted in its broken past. The architecture of transport infrastructure in South Africa has added to this negative perception. If architecture in the new South Africa is to turn against apartheid conditions and express the concerns and aspirations of its people then it should be all inclusive and attempt to integrate marginalized members of society. The architecture should attempt to create a synthesis between past and present, vernacular and contemporary and of pride and identity. An appropriate response which begins to redefine the identity of the public transport industry can find its expression in architecture which interprets culture, society and landscape.

It is clear through the study that transport facilities are some of the most 'public' of buildings within the cityscape. It is very much a portrayal of the identity of the public transport industry, the identity of the city, and the country. As a result of this statement, one can conclude that an appropriate and meaningful architectural approach for a transport interchange can definitely alter the public's perception of the public transport industry in South Africa and begin to redefine its identity.

*"The role that transport facilities play in the creation of an identity for both the industry itself and the city is essential, and one that is often underplayed in this country"- Mokena Makeka (Theunissen, 2009: 22).*

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## **APPENDICES**

### **FORMAL QUESTIONNAIRE**

The formal questionnaire was not used except as a reference for unstructured interviews. The researcher felt that allowing conversations to shape organically through discussion would allow for a greater understanding of the answers and issues at hand. This was proven correct as subjects were able to express themselves in ways not possible when putting pen to paper. It opened up useful avenues for further research and consideration.

A majority of the questions posed in the questionnaire were found to be similar to those found in the National Household Transport Survey (2003) and the Integrated Transport Plan 2010-2015, eThekweni Municipality (2010). The large amount of statistical information gained from these reports was deemed sufficient for the study.

**INFORMED CONSENT FORM**

I, ..... acknowledge that I have been informed that Geoffrey Richards, student number 204509828, is a registered final year Master’s student in Architecture at the University of KwaZulu-Natal. He is conducting research on the design of a Transport Interchange as part of his dissertation, and the interviews I am participating in are aimed at supplementing this research. The information gathered is solely to be used in this regard towards the design of a Transport Interchange.

I understand that participation in this research is purely voluntary. I am under no obligation to participate and may cease my participation at any time as I see fit. There are also no reward/benefits given for participating in the research. I further understand that he is bound by university policy to use this information ethically and confidentially and to store it securely. My response may be acknowledged unless I request confidentiality.

I have been informed that I am free to contact the dissertation supervisors as follows for further information.

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\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**A: Public Transport Survey**

Please enter your details of the in the space provided.

Age:	0-16	16-25	25-35	35-45	45-65	65+
	<input type="checkbox"/>					
Ethnicity:	Black	White	Indian	Coloured	Asian	Other
	<input type="checkbox"/>					
Nationality:	_____					
Place of birth:	_____					
Country of residence:	_____					
Occupation:	_____					

**SECTION B:**

1. How often do you use public transport? (Please tick one only)

Never (skip to section D2)	<input type="checkbox"/>
Seldom	<input type="checkbox"/>
Often	<input type="checkbox"/>
Always	<input type="checkbox"/>

2. What types of public transport do you use?

Taxi	<input type="checkbox"/>
Bus	<input type="checkbox"/>
Train	<input type="checkbox"/>
Metered Cab	<input type="checkbox"/>

3. Which type of public transport do you use the most? (Please tick one only)

Taxi	<input type="checkbox"/>
Bus	<input type="checkbox"/>
Train	<input type="checkbox"/>
Metered Cab	<input type="checkbox"/>

**SECTION C:**

1. How would you rate each type of public transport in terms of safety? (Answer on those relevant to B2)

	Poor	Average	Good	Brilliant
Taxi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metered Cab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct**

**SECTION C continued:**

2. How would you rate each type of public transport in terms of comfort? (Answer on those relevant to B2)

	Poor	Average	Good	Brilliant
Taxi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metered Cab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. How would you rate each type of public transport in terms of quality? (Answer on those relevant to B2)

	Poor	Average	Good	Brilliant
Taxi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metered Cab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. How would you rate each type of public transport in terms of accessibility? (Answer on those relevant to B2)

	Poor	Average	Good	Brilliant
Taxi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metered Cab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION D:**

1. What changes, with regard to public transport, would benefit you as a user? What are your perceptions of the public transport industry?

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2. Why do you not use public transport? What is your perception of the public transport industry?

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PART TWO  
**DESIGN REPORT**

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## **CHAPTER 1: INTRODUCTION**

### **1.1 INTRODUCTION**

From the preceding theoretical study and the subsequent realization of the power that architecture has as a medium to portray and shape identity, the importance of relevant, authentic and meaningful built form is recognised. The information gleaned from the international precedent studies and the local case studies has displayed a significant gap in best practise for transport architecture in South Africa. As a result people's perceptions of the identity of the public transport industry are skewed as a result of apartheid style architecture, which attempted to marginalize both commuters and operators, excluding them from the public realm. *"Nowhere in South Africa are the effects of apartheid and colonialism more clearly visible than in the cities, where the lives of ordinary citizens have been severely inconvenienced by the lack of public infrastructure."* (Deckler et al, 2006: 59).

The need for integration through the creation of an inclusive environment, in order to redefine both the social identity of users and non users and the industry itself is imperative. One can deduce based on the theoretical study that designers of the built environment do not realise the inherent ability that architecture and more specifically transport architecture has to not only portray the identity of the public transport industry but the city as a whole. *"They become the first building blocks which, over time, make South African cities healthier and fitter for a democratic future."* (Deckler et al, 2006: 59).

The aim of this chapter is to establish, based on the review of literature and empirical data acquired, a detailed design brief, appropriate site selection guidelines and inspiration that will facilitate in the design of the proposed transport interchange.

### **1.2 PROJECT DESCRIPTION**

A transport interchange for the Umhlanga New Town Precinct aims to address issues surrounding public transport within a private development, and create an inclusive rather than exclusive environment where current infrastructure quite clearly demonstrates an exclusion of public transport, forcing them to become marginalized users within the public realm. Umhlanga as a precinct is experiencing exponential growth both physically through development and economically in its capacity to create viable job opportunities.

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Unfortunately as a result of a majority of the land been privately owned by Moreland Developments, the property company of the Tongaat-Hulett group, the urban framework has been retro fitted to accommodate public transport and public infrastructure. Current infrastructure cannot deal with growing demands and as a result the entire system suffers in its inability to deal with expanding commuter numbers. Due to lack of provisions and poor infrastructure, the perception created is a negative one and does little to evoke a positive, renewed identity required to appeal to a broader sector of society. Existing conditions mirror the segregation of apartheid and intervention is required in order for the area to reflect the democratic state that we live in.

The aim of the transport interchange is to allow for the seamless transition between modes of transport creating an organised, clear and legible system and in turn redefining the identity of the industry. The building will not act as a rank or terminus but merely a transition space, providing facilities for passing commuters. Promoting and harnessing social interaction between individuals from varying cultural and socio-economic backgrounds through the creation of meaningful spaces is critical in establishing a redefined identity for public transport in South Africa. The design from conception to completion, is to be grounded in the conceptual and theoretical framework It is vitally important to understand the cities plans regarding public transport and to provide facilities in order to harness those opportunities. With an ever growing commuter base and demand for public transport in the area, it is important to allow for expansion to occur, to provide longevity to the project. Bringing together transport architecture, urban design and transport planning into a single discipline is vital to allow for the intervention to flourish on a variety of levels.

The design seeks to alleviate the lack of interaction between the various components that make up the public transport industry by providing all services under one roof. In South Africa, the public transport system is not marketed as a whole, and each operator does its own marketing to a greater or lesser extent (Jennings, 2012). In many cases marketing is targeted at existing users, with no campaigns to attract new users to the system. There is simply no co-ordination. The proposal seeks to create a new 'billboard' for public transport in South Africa- an all encompassing industry that has a common goal to work towards.

### 1.3 THE NOTIONAL CLIENT

#### 1.3.1 The Client's Organization

In the late 1980's and early 1990's, before the North Local Council had been incorporated into the greater Durban area as part of the eThekweni Metropolitan Council, the idea was that the council would form a core component of the Umhlanga Ridge New Town Centre with a significant civic centre, library, fire station, sporting precinct and multimodal transit facility planned (Wood, 2008: 51). A specific focus needs to be placed on long-term sustainability through public transport. An extensive and heavily used bus and taxi system is already in place but issues regarding the infrastructure provisions have been mentioned previously. In addition the Ethekewini Transport Authority (ETA) is in its final planning processes regarding an Integrated Rapid Public Transport Network (IRPTN), with three routes predicated on the town centre linking Umhlanga with Inanda, Ntuzuma, KwaMashu, Phoenix, King Shaka International Airport and the existing CBD, amongst others. In addition to the IRPTN, a people mover shuttle service has been proposed to link Umhlanga Village, Ridgeside, Ridgeside Office Park, La Lucia Ridge Office Estate and Millenium Bridge Business Park with Umhlanga Ridge Town Centre. The Passenger Rail Association of South Africa (PRASA) has also designated a rail head that would run through the adjacent Cornubia Development, terminating in New Town Centre, acting as a catalyst for Transit Oriented Development (TOD) to occur and to serve the burgeoning node of Umhlanga.

Taking into consideration all of these plans the two proposed clients for this project would be the Ethekewini Transport Authority (ETA), representing the eThekweni Municipality and PRASA. The primary source of funding would be from local government with the *Integrated Transport Plan 2010-2015* (ITP), already showing a significant percentage of their budget aimed at addressing infrastructure issues within Umhlanga.



Figure 3.1- eThekweni Municipality Logo (www.durban.gov.za)



Figure 1.4- PRASA Logo (www.prasa.co.za)

### **1.3.2 The Client's Requirements**

The design of a transport interchange should comply with the aims and objectives of the client. As part of dealing with transport related issues within the Umhlanga precinct, the client requires a transport interchange that will accommodate current and future plans, in recognition of the need for more facilities of this nature to exist in South Africa. The client intends to establish a facility that integrates previously marginalized urban users, creating an inclusive public realm, and in turn transforming the identity of the public transport industry.

Restructuring of existing systems, through a well informed, expressive and meaningful architectural approach, will enable the industry to redeem itself and create a new identity.

### **1.3.3 Detailed Client Brief**

The information gleaned from the theoretical discourse, international precedent studies, local case studies and interviews with relevant professionals as well as commuters and operators will assist in the derivation of a brief for a transport interchange within a local context. The brief will establish guidelines which will assist in creating a clear direction for the design of a transport interchange. Brief derivation begins with analysing who the client is and what their requirements and aims and objectives are (see section 1.3.1 & 1.3.2). The client would set out guidelines and principles which the architect would then work towards.

The following functions and their requirements were set up by the client:

#### Minibus Taxi Interface:

Taxi loading space should be provided for not only on the basis of current demands but in consultation with ETA and their prediction of expansion based on various studies undertaken including the *Integrated Transport Plan 2010-2015* and the *Public Transport Plan August 2005*. The building is not to function as a taxi rank but rather as an interface for picking up and dropping off. One should still consider that there are suburban taxi routes and therefore facilities should be provided for short term holding.

#### Bus Interface:

Bus loading space should be provided for in consultation with the two primary operators, Durban Transport and Metro. The efficient running of bus services is the first priority for bus operators. The loading spaces should be designed in such a way to keep delays down to a

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minimum. The bus interface should be separate from the taxi interface and dedicated circulation should be provided. The interface should be designed to absorb backlogging if it were to occur.

### IRPTN Interface:

The IRPTN it to be integrated into the facility preventing the need for a designated station. there should be provision for two busses at any one time. The bus either needs to ramp down or the platform ramp up to allow for universal access. It is vital that this service runs on time and a through lane should be provided to allow for a constant flow of traffic. Dedicated bus lane's should be considered in and around the precinct to assist with the effective functioning of this service. This interface should be separate from the general municipal busses.

### People Mover Interface:

One should consider the clientele of the people mover service and its demand in relation to other services, and position it accordingly. The needs to be a clear hierarchy in terms of spatial arrangement for the different modes of transport. This service could be considered to be a secondary function however the seamless transition between modes of transport still should be considered. The shuttle service should be offered at a reduced price for those commuters transferring to another mode of public transport.

### Umhlanga Cabs Interface:

Umhlanga Cabs is the private metered cab system functioning within the greater Umhlanga area. Currently running out of Umhlanga Village it is proposed that this service be transferred to form part of the transport hub, rather than operation in isolation, allowing for a greater user base feeding off other modes. Sufficient parking space should be provided for vehicles and its pick up area should be positioned according to their user target market.

### Airport Express Link:

The airport express link is a privately run company which allows for a viable alternative to the IRPTN airport route. It is possible for this service to share loading and parking space with Umhlanga Cabs due to its fairly small scale operation.

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### Private Vehicle Pick Up/ Drop Off:

The pickup drop off interface for private vehicles should in no way hinder the functioning of the public transport within the building. This interface should be provided adjacent main entry points to allow for ease of access to the functions occurring within.

### Park and Ride Interface:

Sufficient parking should be required at a reduced rate for those commuters transferring to alternate modes of transport. In off peak hours - at night or on weekends, this parking can be used as overflow for Gateway Shopping centre or for functions occurring at CJ Saunders Park. the park and ride facility does not require primary positioning within the interchange, however one should consider circulation of vehicles during peak hours so that it in no way hinders the functioning of the interchange. These parking facilities should ass to the overall commuter experience.

### Bicycle Interface:

The importance for non-motorized transport in addressing global sustainability issues was addressed in section 3.2.3 of part one of the document. The provision of safe and secure bicycle storage is paramount in attempting to promote the use of bicycles. A small retail component and maintenance facility should be provided and well as a bicycle hiring facility.

### Rail Interface:

The rail interface should have sufficient circulation to deal with large traffic flows during peak hours. Sufficient ticketing facilities should be provided to prevent excess queuing, and secure access should be provided to the platforms via turnstiles. Formal retail opportunities should be provided for on the platforms to allow for commuters to make small purchases while waiting for trains. The interface, although on a lower level, should still have sufficient visual connection to the ground floor via voids or similar, to allow for surveillance to occur and maximising integration into the interchange.

### Waiting Areas:

To promote the success of a transport interchange, human comfort needs to be of paramount importance. The architectural success of the facility will be dependent on the experience of its users. Adequate and comfortable seating should be provided in waiting areas and should

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be designed in such a way to discourage sleeping. Weather protection is desirable over all concourse and platform areas, pedestrian paths and waiting areas. Architecture is a reflection of society through its configuration. The aim should be to create spaces that allow for inclusive, rather than exclusive social interaction between varying user groups within the public transport sector.

### Retail:

Extremely pertinent to the economic sustainability of the facility is the secondary turnover generated by additional facilities in the transport node. Trade opportunities need to be harnessed wherever possible along defined circulation routes. These facilities should be clearly thought out and must be intended to keep the facility active during off peak hours. Allowing for this to occur will provide a safer environment by keeping areas active, creating passive surveillance. The integration of previously marginalized urban traders is vitally important in harnessing a new social identity for these entrepreneurs. Creating an inclusive environment is key. The economic and social power of trade in South African public transport means that the concept of trade should be embraced. Various sizes of retail outlets should be provided for different opportunities.

### Administration Offices:

Administration offices for the various functions of the building should be provided on first floor to allow for privacy and also uninterrupted trade and retail on the ground floor plate. Offices will include administration areas for Umhlanga Cabs, the various bus operators, taxi industries as well as a control room for the IRPTN. Included in the various functions will be driver rest rooms and security.

### Central Information and Ticketing:

Key to the effective functioning of a building of this size is having infrastructure in place to deal with ticketing and information sharing. The ticketing/information office should be centrally located and clearly visible to all users. One central ticketing facility that deals with all modes of transport is desired to allow for incentive rates to be implemented.

#### 1.4 SCHEDULE OF ACCOMODATION

In order to create a refined accommodation schedule, a significant amount of research was put into gaining exact commuter numbers during peak hours that would utilize the facility. All spaces need to be designed around AM and PM peak periods where the most amount of people would be utilizing the interchange at one time. Meetings with various members from eThewkini Transport Authority (ETA) and a thorough analysis of Current Public Transport Records (CPTR) and the IRPTN allowed the author to gain valuable insight into the Umhlanga node. The following commuter numbers were obtained from which a detailed accommodation schedule can be formed:

- Walking: 2500/hr
- Bus: 2000/hr (1 bus every 1.5 mins)
- BRT: 2600/hr (1 bus every 3 mins)
- Taxi: 3600/hr (1 taxi every 16 secs)
- Rail: 7500/hr
- **TOTAL: 18200/hr**

According to Andre Duvenage, architect on the IRPTN, current records show Bridge City peaking at 25000/hr. Taking into consideration Bridge City's role as a terminus station, and the predictable high numbers as a result, one can see how important the Umhlanga node becomes as part of the greater Northern Corridor Development framework.

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<b>MAIN FACILITY</b>
<b>GROUND FLOOR</b>
<b>COMMON AREA</b>
Central Information Centre
Retail
Restaurant/Fast Food
Convenience Stores
Ticketing offices
<b>TAXI COMPONENT</b>
holding area
loading bays
waiting area
trade/retail areas
<b>BUS COMPONENT</b>
BRT
Durban Transport busses
Metro busses
Ticketing Kiosk
<b>BICYCLE FACILITIES</b>
bicycle storage
bicycle hire
admin office
Maintenance Area
<b>LOWER LEVEL TRAIN PLATFORM</b>
<b>RAIL COMPONENT</b>
station hall
ablutions
ticketing
seating
platforms
retail
<b>FIRST FLOOR</b>
<b>BUS COMPONENT</b>
BRT Management offices
Restrooms for drivers
Security offices
<b>UMHLANGA CABS</b>

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Admin office
loading bays
holding bays
<b>TAXI COMPONENT</b>
Management Offices
Restrooms for Drivers
Security offices
<b>PEOPLE MOVER</b>
admin offices
loading bays
<b>AIRPORT EXPRESS LINK</b>
admin offices
loading bays
<b>BASEMENT</b>
<b>PARKING</b>
Staff Parking
Park and Ride
Disabled Bays
Service bays
<b>SERVICES</b>
Refuse
Recycling
Plant Room
Retail Storage

## 1.5 CONCLUSION

A schedule of accommodation has been drawn up based on the clients projected outcomes and general requirements were gathered from the empirical data of the cases studies as well as interviews with built environment professionals and current operators and commuters. Using the theoretical discourse as a base and having gained the necessary information regarding a detailed client brief and their aims and objectives for the project, as well as an accommodation schedule, it is important to establish a list of site selection criteria that will lead to the selection of an appropriate site. This exercise will be carried out in the following chapter.

## **CHAPTER 2: SITE SELECTION, SURVEY AND ANALYSIS**

### 2.1 INTRODUCTION

The following chapter deals with the selection of an appropriate site for the design of a transport interchange. Having set out a detailed brief and schedule of accommodation one can begin to analyze sites of adequate size and positioning. The choice of Umhlanga as a precinct is to address issues previously mentioned in this report. One of the primary aims of this dissertation is to create inclusive environments for marginalized urban users. This issue is prevalent in the Umhlanga area and by resolving it through built form will begin to transform the identity of the public transport industry. The opportunity to create a link between Bridge City in Kwa Mashu, the CDB and the airport through a transport interchange in the burgeoning node of Umhlanga adds to the relevance of precinct choice. It must be clear that transport interchanges cannot be 'build it and they will come' projects. There needs to be an existing demand with an existing transport network. Based on analysis the existing infrastructure in Umhlanga cannot deal with growing demand. However, one should also note that the opportunity to appeal to wider socio-economic groups based on the makeup of the area is extremely high. 17% of higher income users do not use public transport as a result of it not being available to them, 29% say that it is inconvenient and 14% feel that it is unsafe (www.transport.gov.za) The author strongly feels that by placing public transport infrastructure on the doorstep of individuals who don't use public transport, may bring about a change in lifestyle and encourage them to become reliant on public transport as a mode. By promoting the seamless transition between modes and a viable alternative to automobile's through a responsive architectural approach which addresses issues of safety and security will bring about change in the statistics previously mentioned.

### **2.1.1 Site Selection Criteria**

The site is selected based on criteria derived from the preceding literature review and conceptual and theoretical framework. The site required is of very specific nature and must fulfil numerous practical and theoretical requirements, particularly with regard to vehicle and pedestrian links. The primary requirements the site is to fulfil are:

- Access to parks and recreational space in order to create an effective genius loci and identity formulation in the mind of the user
- Access to supporting retail/commercial nodes
- Proximity to existing taxi routes
- Proximity to existing bus routes
- Proximity to IRPTN
- Proximity to rail networks
- Access to main roads for ease of entry and exit
- Sufficient surrounding road infrastructure to deal with added traffic and congestion
- Proximity to high density residential to promote walkability and use of non motorized transport and support of public transport
- Access to employment opportunities within 400 metres/ five minutes to grow demand
- Transit Oriented Development within an 800 metre/ 10 minute walk to support transport development and the proposed transport interchange
- Walkability - Effective neighbourhood design
- Site orientation in order to harness natural light and allow for cross ventilation

### **2.1.2 Geographical Position**

Umhlanga is located approximately 15 kilometres north of Durban CBD. Umhlanga Rocks has experienced huge growth to become the popular holiday destination that it is today. Umhlanga Rocks began as a humble beach cottage, the Oyster Box, but the warm sub-tropical climate soon attracted many to this area and by 1931 Umhlanga Rocks had become a village with additional cottages, stores, hotels and guesthouses ([www.umhlangaridge.co.za](http://www.umhlangaridge.co.za)). The tin roof of the Oyster box was used as a navigational beacon until 1953 when the automatic lighthouse was built. The need for the lighthouse was because of the frequency with which ships mistook the uMgeni River Mouth for Durban harbour (Schauffer, 2012: 42). As development continued in this area, buildings such as the Victoria, the first hotel, have

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been rebuilt and refurbished. The Oyster Box Hotel which first opened its doors to the public in 1947 has also been rebuilt as a stylish colonial hotel on the site of the original farmhouse ([www.umhlangaridge.co.za](http://www.umhlangaridge.co.za)).

Today Umhlanga retains the charm of a seaside village while witnessing tremendous growth inland along Umhlanga Ridge. Umhlanga Ridge has become the new town centre and overlooks the ever growing village of Umhlanga Rocks.

Umhlanga Ridge is situated, overlooking the village of Umhlanga Rocks to the east, with easy access to a network of major roads including the N2 which connects Durban to the new King Shaka International Airport. It is the ease of access which has been seen as a benefit to many of the businesses that have decided to take up residence here ([www.umhlangaridge.co.za](http://www.umhlangaridge.co.za)).



Figure 2.1- A Map showing the extents of the eThekweni Municipality and the geographic location of Umhlanga in relation to other major nodes. (Author)

### **2.1.1 Historical Context**

In the late 1980's and early 1990's, within the context of pending democracy in South Africa and as a result of the complex, fragmented and politically motivated make up of what was termed the Durban Functional region (DFR), Tongaat Hulett created the DFR planning forum (Wood, 2008: 50). The planning forum included a wide range of members from across the political board as well as participants from both the public and private sectors. Tongaat Hullet came to a realization that much of its extensive land used for agricultural purposes was becoming more valuable for urban development (Wood, 2008: 51).

The planning forum was to put together a rational and appropriate response to the urban maladies created by apartheid. This resulted in the development of the Northern Corridor which conceptualized the creation of a mixed use inland spine and a residential/ tourism coastal spine (Wood, 2008:51). The primary nodes of this plan included RiverHorse Valley Business Estate, Bridge City, Mount Edgecombe, Cornubia and Ottawa Flats, Canelands, King Shaka International Airport, Umhlanga Ridge and Zimbali (Wood, 2008:52). The primary goal of the Northern Corridor was the create job opportunities in the Northern regions, where the majority of the population of Durban actually resided. This would negate the need for extensive travel and reliance on public transport to get to the majority of job opportunities in the central and southern regions, creating a more sustainable urban transport network.

The anchor to this corridor is the urban node at Umhlanga, in the form of Umhlanga Ridge New Town, and the development thrust into the Inanda, Ntuzuma, KwaMashu (INK) region, anchored by Bridge City.

## 2.2 URBAN ANALYSIS AND UMHLANGA AND SURROUNDINGS

The intention of this project is to create a link between the three primary nodes along the Northern Corridor and the CBD via an integrated transport hub at Umhlanga New Town



Figure 2.2- A graphic showing the project intentions within the urban realm. (Author)

One can see from the image that Umhlanga's central geographic location means it becomes an integral part of the northern corridor development. When the public transport network is analyzed it can be seen that there is significant development required to deal with the forecast commuter numbers into the node. The following images show the plans both eThekweni Municipality and the Passenger Rail Agency of South Africa (PRASA) have for the northern region. It is important that both current and future plans are considered so that the interchange is capable to be manipulated to accommodate expansion and redevelopment.

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Figure 2.3- Rail network along the Northern Corridor (Existing-Green, Proposed-White). (Author)

Figure 2.3 shows the existing North/South rail network along the Northern corridor. This network is severely underutilized by passenger rail and a means to effective Transit Oriented Development can be achieved through an effective rail network with stations acting as catalysts to development as seen in the Gautrain project in Gauteng, South Africa. PRASA are aware of the significant development occurring to the north of the CBD and have indicated its intentions to upgrade the current network through the development of rail spurs into the three primary nodes along the Northern Corridor, with the spur to Bridge City in the final phase of construction.

Through this development the nodes are activated and allow for a sustainable urban transport network to be created.

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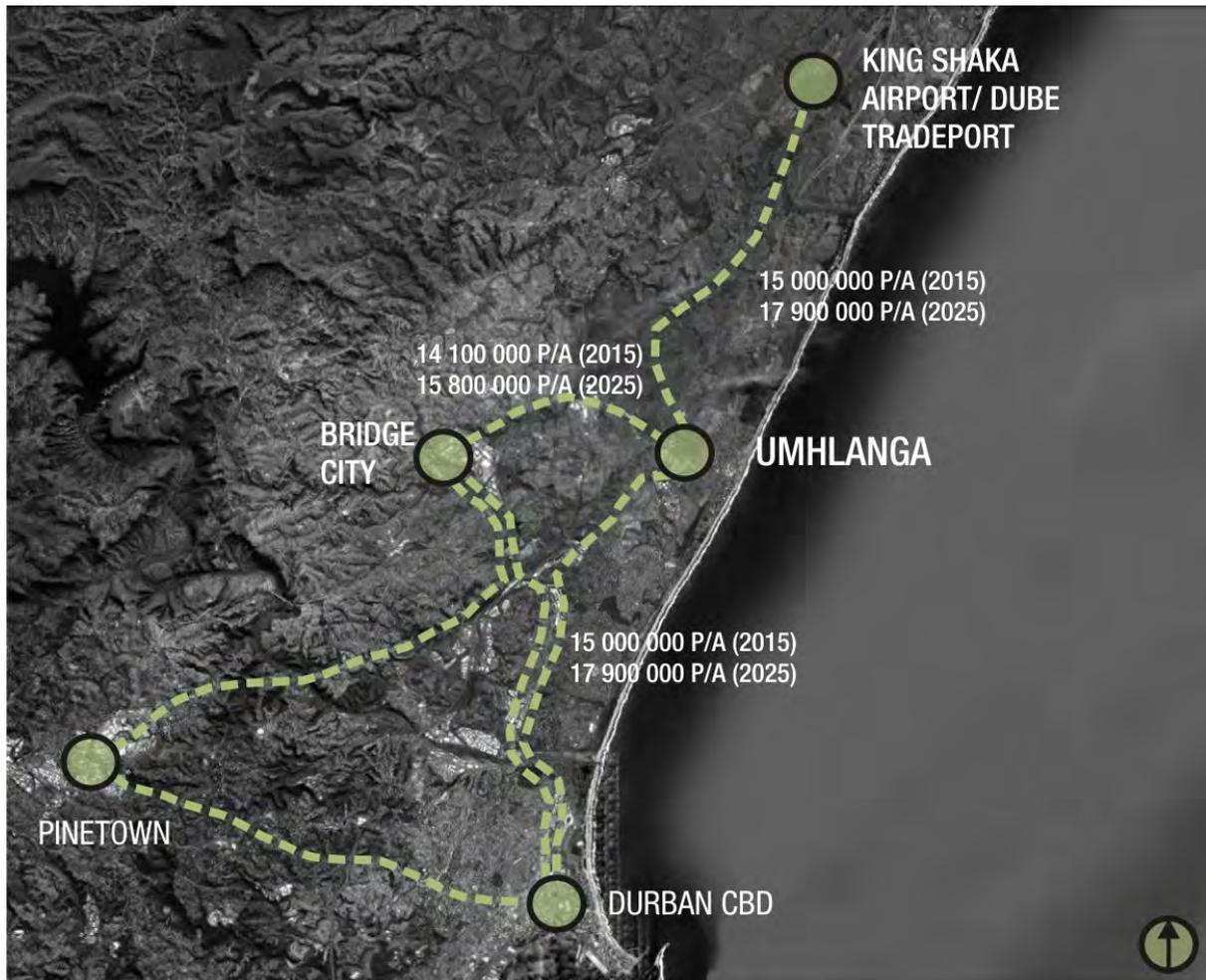


Figure 2.4- The IRPTN for eThekweni Municipality. (Author)

Figure 2.4 shows the Integrated Rapid Public Transport Network (IRPTN) for the eThekweni Municipality. The IRPTN is based on the Bus Rapid Transit (BRT) in Curitiba, Brazil. The IRPTN networks directly connects Umhlanga with Bridge City, King Shaka International Airport and the CBD. A terminus station occurs in the CBD on Soldiers Way with trunk stations at the various other nodes. Umhlanga is one of the primary nodes in the network with three separate routes terminating there.

The ability to connect this IRPTN with different transport modes at Umhlanga is of primary importance to allow for effective transition between modes.

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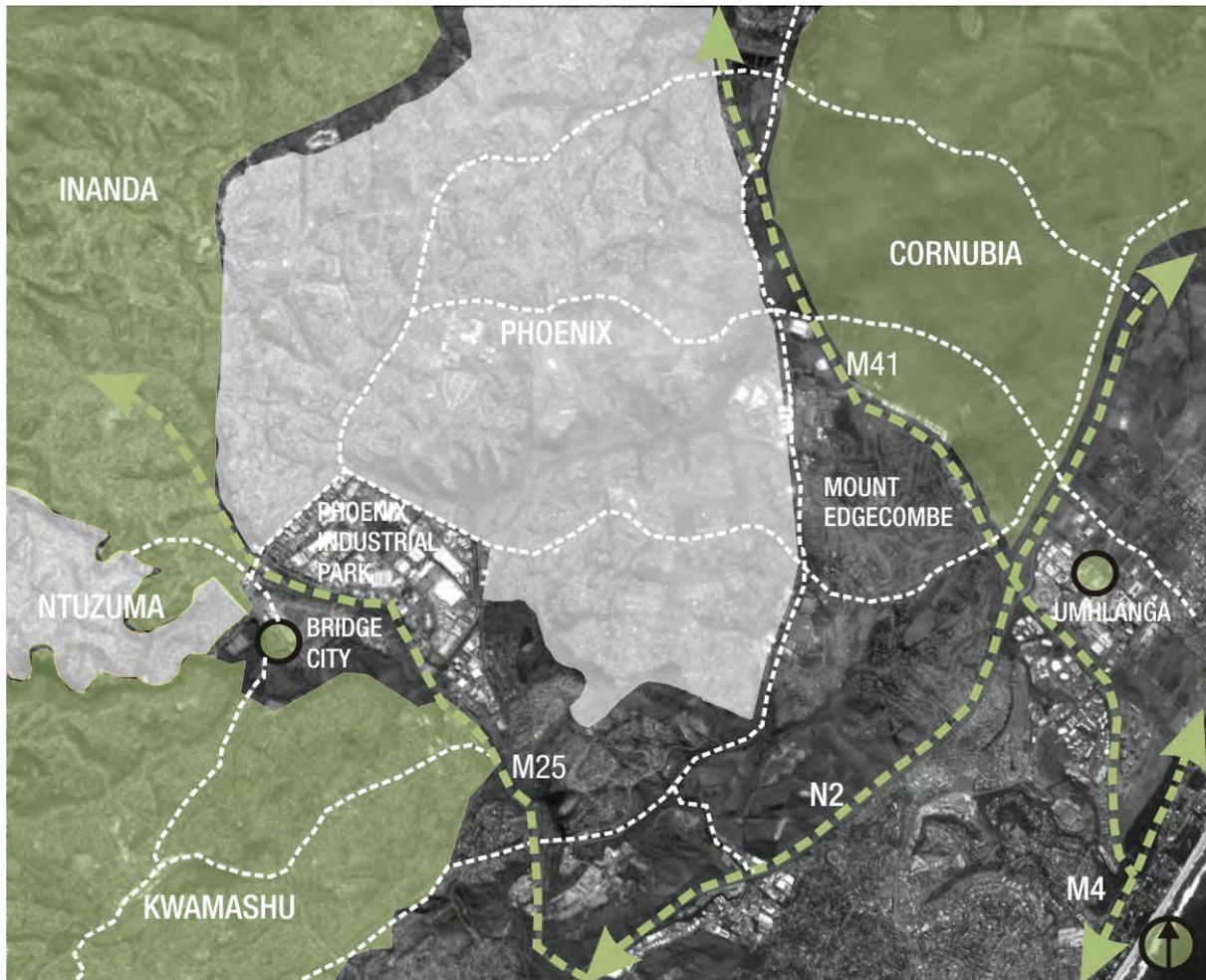


Figure 2.5- The effective feeder zones to Umhlanga as a result of the IRPTN and PRASA network. (Author)

Figure 2.5 shows the areas in the immediate surroundings of Umhlanga that will now have direct access via an upgraded transport network. These include the INK region of Inanda, Ntuzuma and KwaMashu as well as Phoenix and the proposed mixed income housing and business development at Cornubia.

The Cornubia project, measuring 1303 ha, represents a strategic project between eThekweni Municipality and Tongaat Hulett aimed at developing a mixed use urban settlement comprising a range of complimentary land uses (Iyer, 2010: 11). Cornubia is widely regarded as a potential key project in the quest for Integrated Human Settlement (IHS). Key to IHS being successful is the provision of housing which will carry a full range of residential markets, including low income housing initiatives spearheaded by eThekweni Municipality (Wood, 2008: 54). The primary goal of the Cornubia development is to create an integrated urban environment structured around public transport. The subsequent influx of commuters into Umhlanga requires a significant upgrade to existing transport infrastructure in the area.

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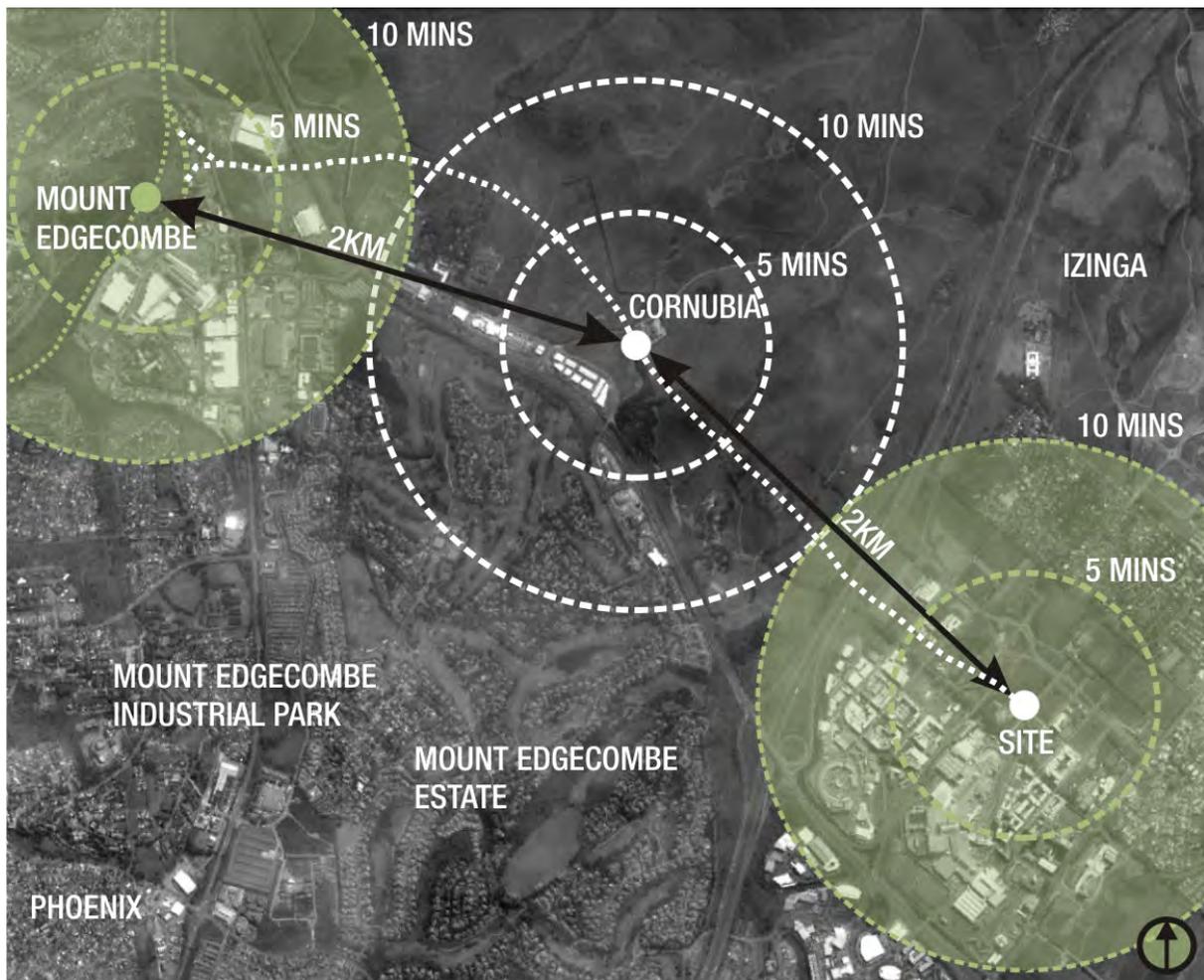


Figure 2.6- The proposed rail spur from mount Edgecombe, through Cornubia and terminating in Umhlanga New Town. (Author)

Figure 2.6 displays the proposed railway spur that runs through the Cornubia Development terminating in Umhlanga New Town. The existing rail siding at Mount Edgecombe station will be used to integrate the new spur. The use of rail networks in creating catalysts for development is well documented. The phenomena known as Transit Oriented Development (TOD) will effectively kick start development in Cornubia, with a station on the edge of the development and a terminus in Umhlanga New Town.

The effective ten minute walking radius encompasses the entire Umhlanga New Town Centre and well as the immediate context including Ridgeside, La Lucia Ridge Office Park and the residential areas of Prestondale, Umhlanga Ridge and Umhlanga Manors.

The key to successful TOD is a mix of land uses, and high density housing. The area surrounding the proposed station has both of these elements.

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Figure 2.7- The extensive development occurring in and around Umhlanga as part of the Northern Corridor development. (Author)

The extensive development occurring in and around the Umhlanga node shows the success of the Northern Corridor Development. However with development comes the need for extensive transport infrastructure. At present current infrastructure cannot deal with existing demands and with further development still to occur the problem will intensify. In figure 2.7 numbers 1-17 show complete and current development while letters A-E show future development.

As a result of this development the eThekweni municipality projects the Umhlanga region to create up to 70 000 jobs by 2020. This is an increase of 50 000 jobs since 1996. Only the industrial node of Pinetown and Durban Central are projected to create more jobs (Public Transport Plan, 6.4). According to Andre Duvenage, architect on the IRPTN, statistics already show a pattern shift in commuting. In the past people would more from the Northern regions to the CBD or the Southern Industrial Basin, however in the past two years commuters are now moving in the opposite direction to job opportunities being created in the North.

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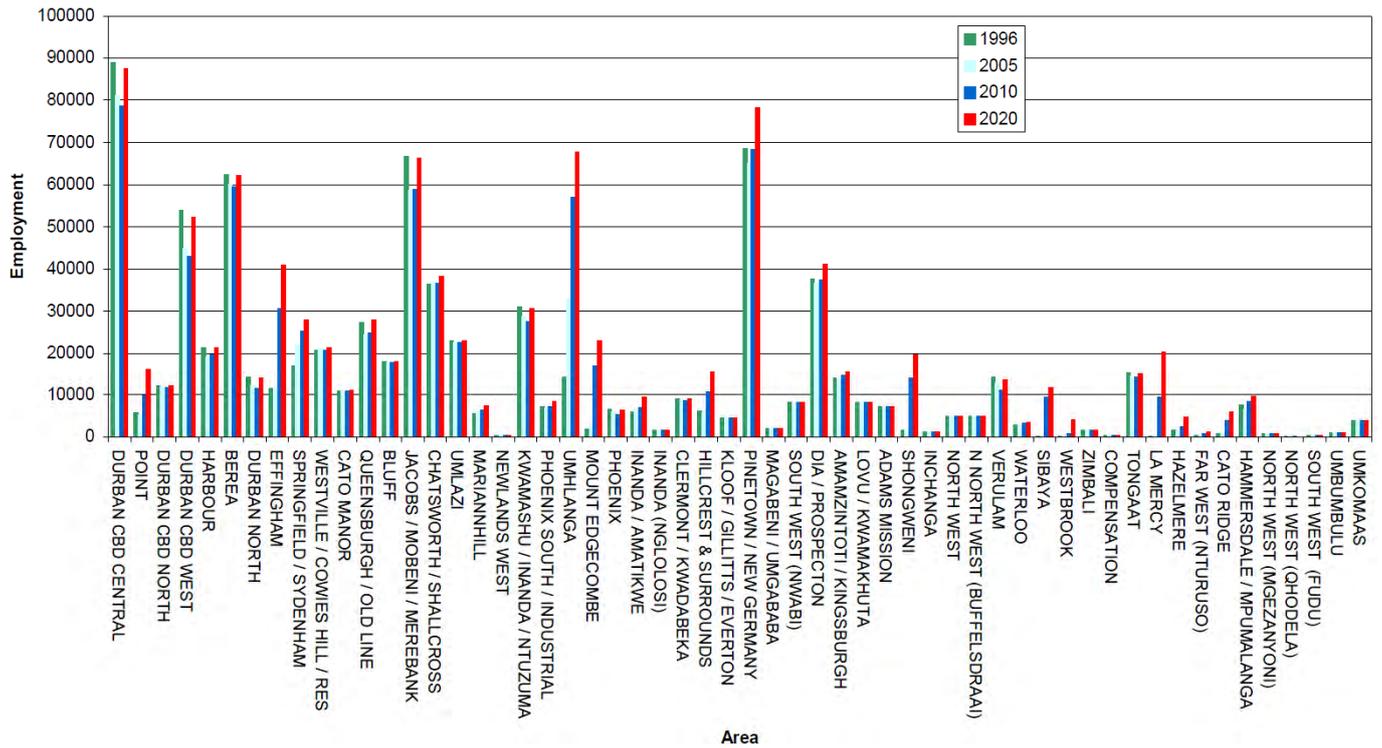


Figure 2.8- A table showing areas of job creation in the eThekweni Municipality. (Public Transport Plan, 6.4)

## 2.3 SITE SELECTION AND DISCUSSIONS

### 2.3.1 Introduction

Site selection began with the setting out of selection criteria as listed in section 2.1.1. Evaluation of three sites followed with each being analyzed according to the criteria with a scoring system revealing the best suited location for the proposed interchange.

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Figure 2.9- A map of the Umhlanga precinct showing the three potential sites. (Author)

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Figure 2.10- Site Option One. (Author)

**2.3.2 Site Option One**

Site One is situated in the heart of Umhlanga Ridge New Town just north of Gateway Shopping centre. The site is an open plot of land owned by eThekweni Municipality, and has been earmarked as part of a greater civic node including a multi-modal transport hub, library, fire station and post office/ municipal building.

**Strengths:**

- Access to parks and recreational facilities
- Access to retail/commercial nodes
- Proximity to IRPTN

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- Proximity to Rail Network
- Proximity to high density residential
- Access to employment opportunities
- Transit Oriented Development framework
- Site orientation
- Proximity to existing transport routes

### Weaknesses:

- Access to national highways
- Perceived "elitist" area
- Lack of street activation around the site
- Existing connection to Gateway is weak
- Wide, main road between site and Gateway
- Walkability

### 2.3.3 Site Option Two



Figure 2.11- Site Option Two. (Author)

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Site Two is located on Umhlanga Rocks Drive within the Ridgeside Commercial and Residential Development. It sits on a steep parcel of land owned by Tongaat Hulett, adjacent an environmentally sensitive area that would become a terraced park in the next phase of development.

### **Strengths:**

- Proximity to existing minibus taxi routes
- Proximity to existing bus routes
- Access to Main roads
- Sufficient surrounding road infrastructure
- Proximity to parks/Recreational facilities
- Access to employment opportunities
- Access to retail/commercial nodes

### **Weaknesses:**

- Extremely steep site
- Orientation
- Walkability
- Proximity to rail network
- Proximity to IRPTN
- Proximity to high density residential
- Perceived "elitist" area
- Wide, main road between site and Gateway

### **2.3.4 Site Option Three**

Site Three is located in Umhlanga Rocks Village at an existing taxi, bus rank. Conveniently located on the main entrance road to the village it has a variety of amenities in close proximity.

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Figure 2.12- Site Option Three. (Author)

**Strengths:**

- Walkability
- Proximity to bus routes
- Proximity to minibus taxi routes
- Access to main roads
- Access to parks/recreational space

**Weaknesses:**

- Proximity to rail network
- Proximity to IRPTN
- Access to employment opportunities

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- Transit oriented development
- Proximity to high density residential
- Site orientation
- Proximity to economic development

**2.3.5 Conclusion**

Criteria	Site 1	Site 2	Site 3
Access to Parks, Recreational Space	10	10	8
Access to Retail/Commercial Nodes	10	8	6
Proximity to Taxi Routes	7	10	7
Proximity to Bus Routes	7	10	9
Proximity to IRPTN	10	5	0
Proximity to Rail Network	10	0	0
Access to Main Roads	7	10	9
Sufficient Surrounding Road Infrastructure	9	10	6
Proximity to High Density Residential	10	5	4
Access to Employment Opportunities (400m/5min)	10	8	5
Transport Oriented Development (800m/10min)	10	8	3
Walkability (Effective Neighbourhood Design)	5	4	10
Site Orientation	10 (North/South)	5 (East/West)	5 (East/West)
<b>Total (130)</b>	<b>115</b>	<b>93</b>	<b>73</b>

A table has been drawn up to show the comparisons between the three sites and a rating out of ten (10) has been given to each of the sites for their performance under the various criteria. A score of ten demonstrates that the site could not perform any better that it has already and a score of zero shows that the site is totally inadequate in fulfilling that specific criteria.

After applying the various criteria Site One received the highest rating overall and has therefore been selected as the preferred site. The major advantage of the site is it central location and excellent connection to both existing and proposed transport routes. It also sits in the heart of an area experiencing exponential physical and economical growth.

## **2.4 BACKGROUND OF SELECTED SITE**

### **2.4.1 History**

Before the development of the Northern Corridor, Umhlanga Rocks already enjoyed a high profile but the lack of land in the node between the beach and the M4 coastal highway prevented it from expanding beyond a coastal resort town (Wood, 2008: 51). In order to have a meaningful contribution to the Northern Corridor Concept, Tongaat Hulett developed the Mount Edgecombe Golf Estate and La Lucia Ridge Office Park. The intention of the office park was to create a new commercial node north of Durban. Having established the area, the intention was to use La Lucia Ridge Office Park as a catalyst for a new, high density, mixed use town centre for the emerging region on existing Tongaat Hulett sugar farming land, which would be serviced by the N2 highway. This node would be capable of relieving the pressure for urban growth in and around Umhlanga Rocks (Wood, 2008: 51).

### **2.4.2 Location**

The site is located within the heart of the Umhlanga New Town precinct on three separate land parcels owned by the eThekweni Municipality. The site is bordered on the south western edge by Centenary Boulevard which forges an axis through New Town, down to Umhlanga Rocks and the M4 highway. West of Centenary Boulevard is Gateway Shopping Centre, a 136 000 square metre shopping complex - the cornerstone of the town centre's growth.

The site is bounded on the eastern edge by The High Street, which becomes Palm Boulevard as it crosses Centenary Boulevard at Garden Circle. Palm Boulevard is the primary pedestrian axis around the Gateway precinct which is designed to accommodate a variety of restaurants that spill out onto the pavements. West of The High Street is CJ Saunders park, a vibrant oasis within the heart of the New town precinct. The landscaped park uses the natural slope of the land to create a terraced amphitheatre which is used extensively for music concerts and theatrical performances.

The site is bounded on the northern edge by Park Drive, with medium density urban mixed use buildings to the North.

The site is bounded to the west by Umhlanganathi Circle and Twilight Drive which forges an axis from La Lucia Ridge Office Park in the west to the residential area of Prestondale in the north.

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Figure 2.13- The location of the site within its 800 metre/10 min walking radius. (Author)

## 2.4.3 Development Guidelines

Zoning: Civic

Building lines: None

Precinct Height Restriction:

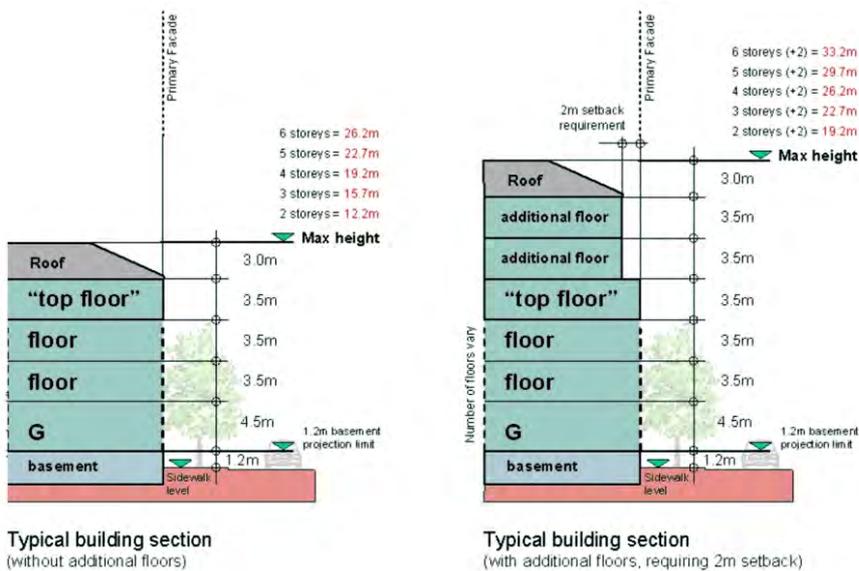


Figure 2.14- Building height restrictions within the New Town precinct. (GAPP, 2012)

## 2.5 URBAN ANALYSIS

Kevin Lynch in *Image of the City* (1960), writes about how one goes about surveying an area and mapping out various assets and debits that an area has in terms of urban design. By using his criteria, the chosen site was analysed in terms of its urban assets which one could build on, and its debits which one could focus on and turn into opportunities.

Before analysing the site, one needs to gain an understanding of the terminology used by Lynch and the five markers he sees as important when surveying an area:

From direct interaction with the public and analysis of field research, what evidently arises is that each person's environmental image shows a distinct connection between built form and the public image. Each of those images is constructed from five primary elements:

**Paths:** *"Paths are channels along which the observer customarily, occasionally, or potentially moves"* (Lynch, 1960: 47). Paths are important as people experience the environment through these paths. They need to be clear and legible. Examples of paths are roads, promenades and railway lines.

**Districts:** Districts are different sections of the environment that make up the city as a whole. They have 2D quality and can be experienced from the inside looking outward (Lynch, 1960: 47). They have a recognisable character, a concentration on specific themes or characteristics. Examples of districts are industrial areas, residential areas, university campuses and CBD's.

**Edges:** Edges are defined as lateral references or linear elements which people use to define certain spaces in the environment. Edge definition is important for organising images- images people have in their mind of the environment. People use edges to navigate the area. Examples of edges are the ocean, rivers, terminations of districts and walls.

**Nodes:** Nodes are intensive points which observers can enter through (Lynch, 1960: 47). It is a concentration of a crossing of various paths and it allows one to shift ones movement. Nodes often involve transport aspects whether it is switching from bus to train, or underground to taxi. Nodes encourage growth of strong commercial and residential activity.

**Landmarks:** Landmarks are elements in the environment that are points of reference. the observers do not necessarily enter or experience them, but rather use them to navigate the

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environment (Lynch, 1960: 48). landmarks are external prominent features such as water towers, communication towers, monuments and religious buildings.

An analysis of the site was carried out looking at the assets and debits as recommended by Lynch:

### **Assets:**

- Presence and quality of footpaths
- Defined districts
- Low crime
- Access to commercial/retail (economic development)
- Established pedestrian and transport routes
- Defined paths
- Land use mix
- Access to high density residential
- Access to IRPTN
- Transit Oriented Development

### **Debits:**

- Large city blocks
- Lack of street activation
- Car dominated
- Lack of hierarchy of elements
- No landmark features (uniform architecture and scale)
- No consideration for bicycles
- "Unfiltered" permeability
- Lack of sufficient transport infrastructure
- No defined nodes (transport, activity)

An investigation was done into the city block sizes of the most walkable cities in the world, to determine what the ideal city block size would be to promote walkability in the area. The city block sizes of New York, Portland and Paris were compared to Umhlanga New Town.

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Figure 2.15- New York city grid size. (Author)



Figure 2.16- Portland city grid size. (Author)

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Figure 2.17- Paris city grid size. (Author)



Figure 2.18- Umhlanga New Town city grid size. (Author)

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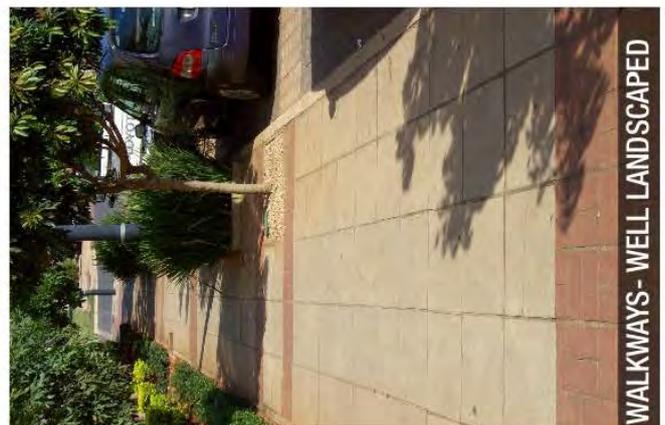
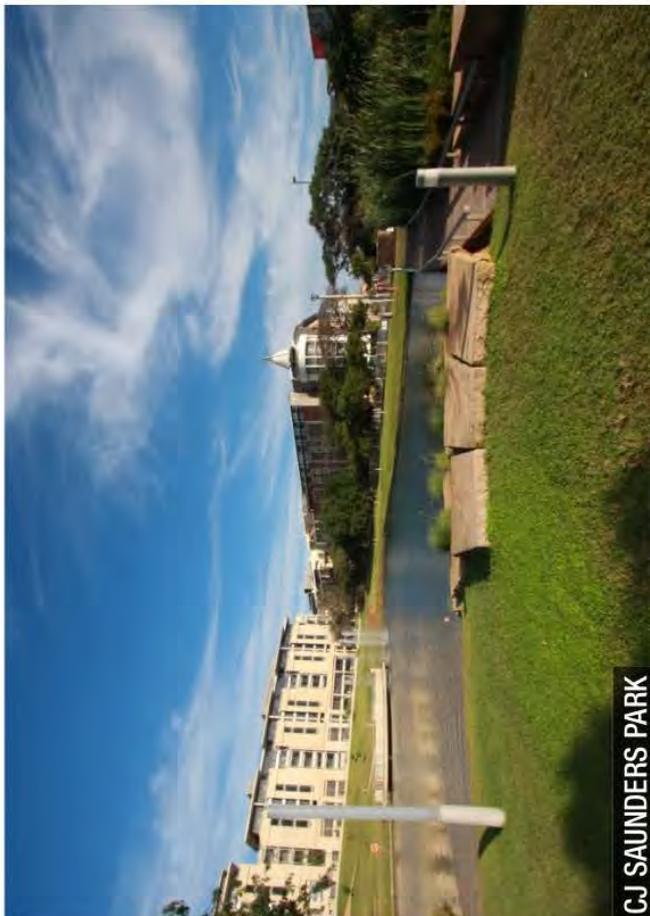


Figure 2.19- Photo's of the urban realm around the Umhlanga New Town precinct. (Author)

2.6 PUBLIC TRANSPORT ANALYSIS



Figure 2.20- Public Transport Analysis Key Plan. (Author)

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Figure 2.21- Metro busses forced to use vacant land as holding areas. (Author)



Figure 2.22- Taxi rank forced to the periphery of Gateway Shopping Centre. (Author)



Figure 2.23- Informal and illegal pick up/drop off occurring on the M41 highway. (Author)



Figure 2.24- Minibus taxis using pick up/drop off lay bye's as ranking space causing congestion during peak hours. (Author)



Figure 2.25- Chaotic peak PM scenes. Lay bye's are unable to deal with bus and minibus taxi demands. Commuters are forced to risk their lives by informally crossing the road. (Author)



Figure 2.26- Traders forced to use waiting areas and paths to display goods. No formal trading facilities are available. (Author)

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Figure 2.27- Run down, dirty, marginalized apartheid style transport facility. (Author)



Figure 2.28- Ticketing facilities unclear, unintegrated and lack universal access. (Author)

It is clear from the public transport analysis that there is a serious problem surrounding public transport in the Umhlanga precinct. The urban design framework has been retro-fitted to accommodate public transport and the current network is fragmented and lacks integration with the urban realm. Modal transfer is non-existent as transport infrastructure is scattered around the precinct, forcing people to walk between modes in an attempt to activate the street edge. This causes the system to be inconvenient, unsafe, uncomfortable and illegible, and in no way begins to create a viable alternative to the automobile.

If one is to create a public transport system that becomes an alternative through choice rather than by force, then serious infrastructural upgrades are needed in the precinct. At present the public transport sector is forced to the periphery, excluded rather than included, marginalized rather than integrated. The conditions mirror an apartheid system that in no way appeals to a wider spectrum of society and evokes a negative identity to the public transport industry.

The current infrastructure cannot deal with the current growing demands, and as development in the area continues, commuter numbers are forecast to increase. As a result the system does not operate as smoothly and efficiently as it could.

Through the design proposal, the problems mentioned will be resolved, and an integrated network will be able to be experienced by commuters from all socio economic backgrounds, redefining the identity of the public transport industry in the process.

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## 2.7 SITE ANALYSIS

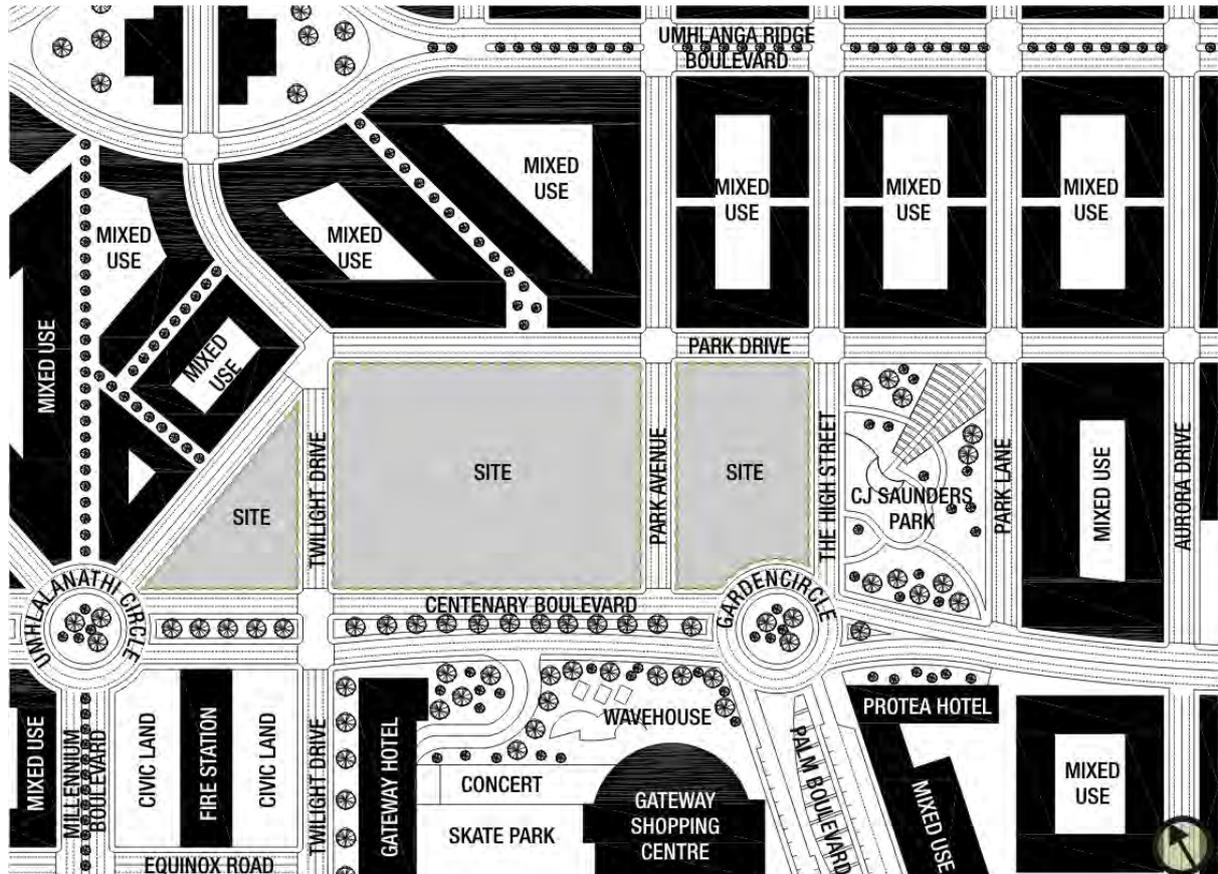


Figure 2.29- Existing Roads and Land use. (Author)

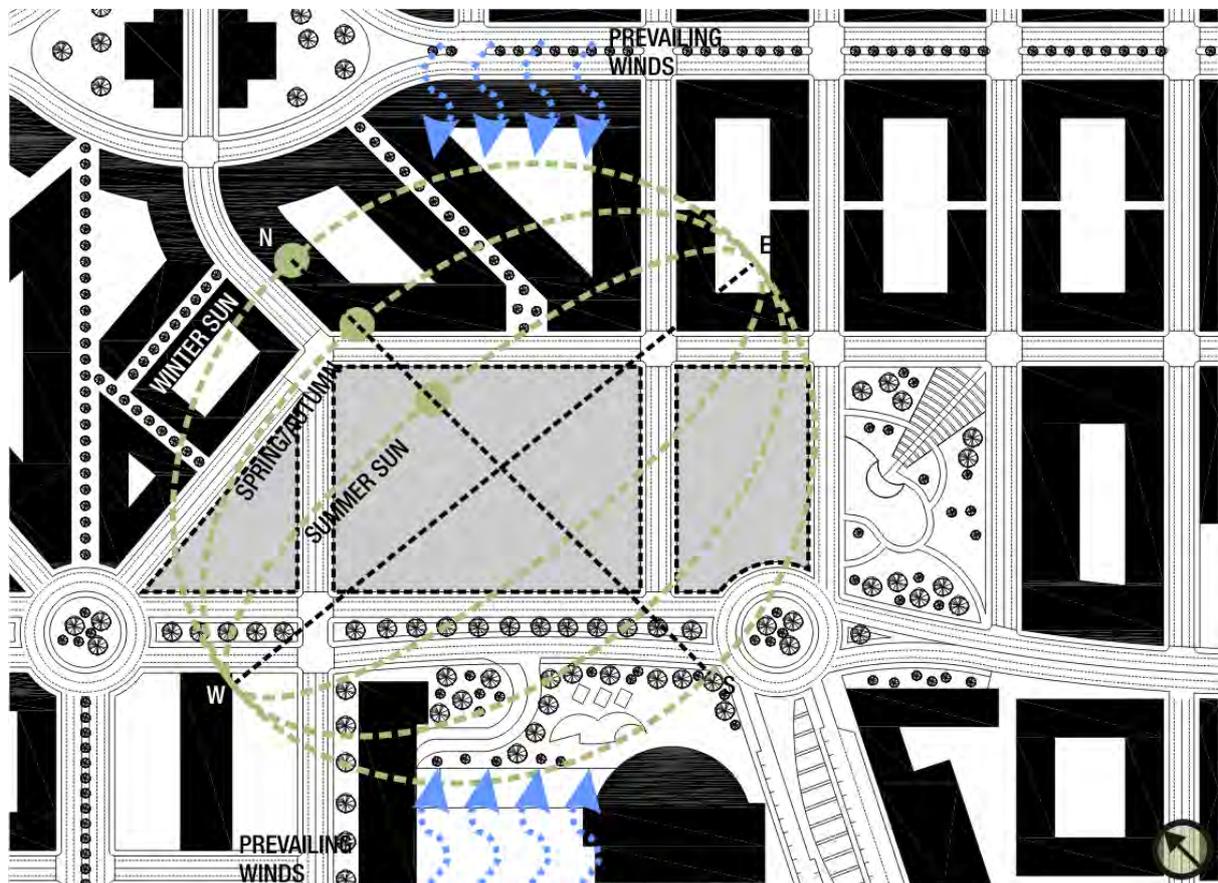


Figure 2.30- Climatic conditions on site. (Author)

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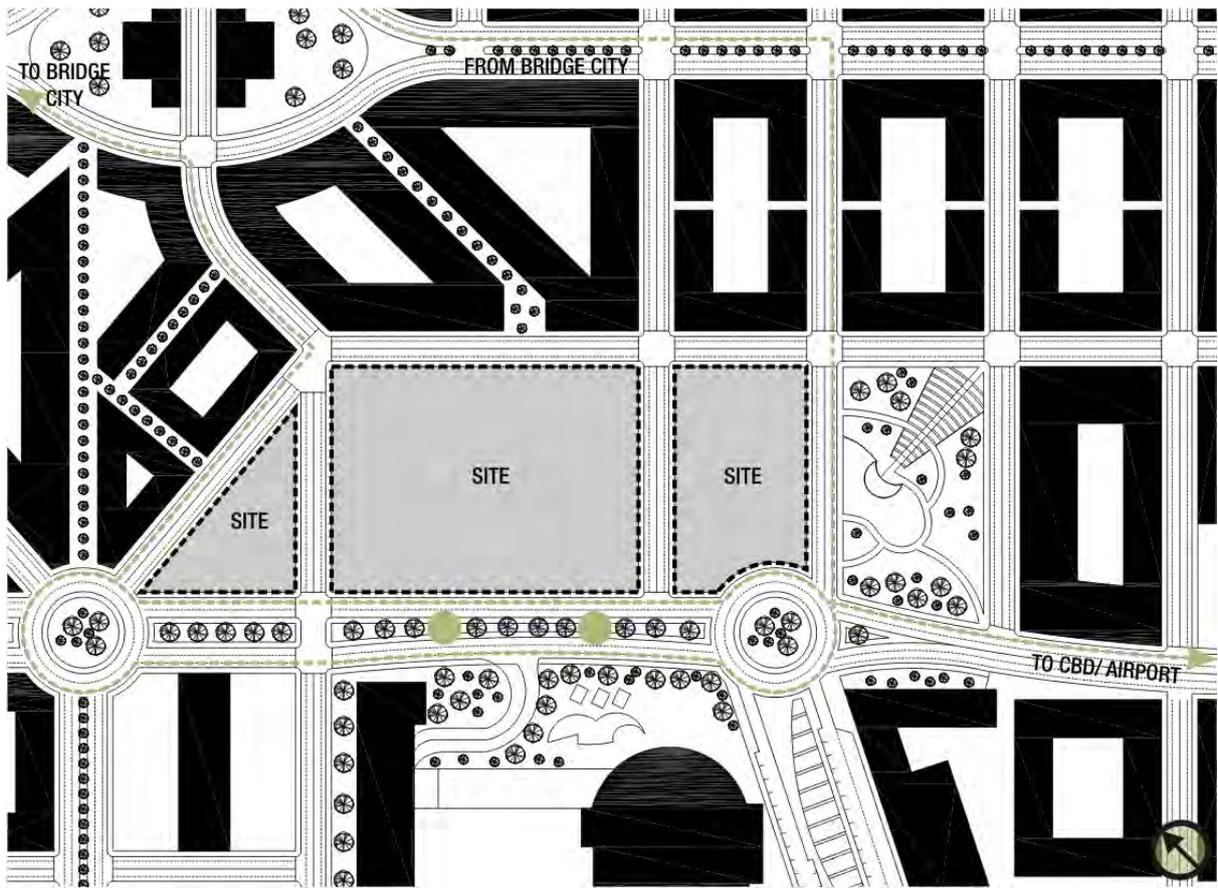


Figure 2.31- Integrated Rapid Public Transport Network routes with ETA's proposed transfer station. (Author)

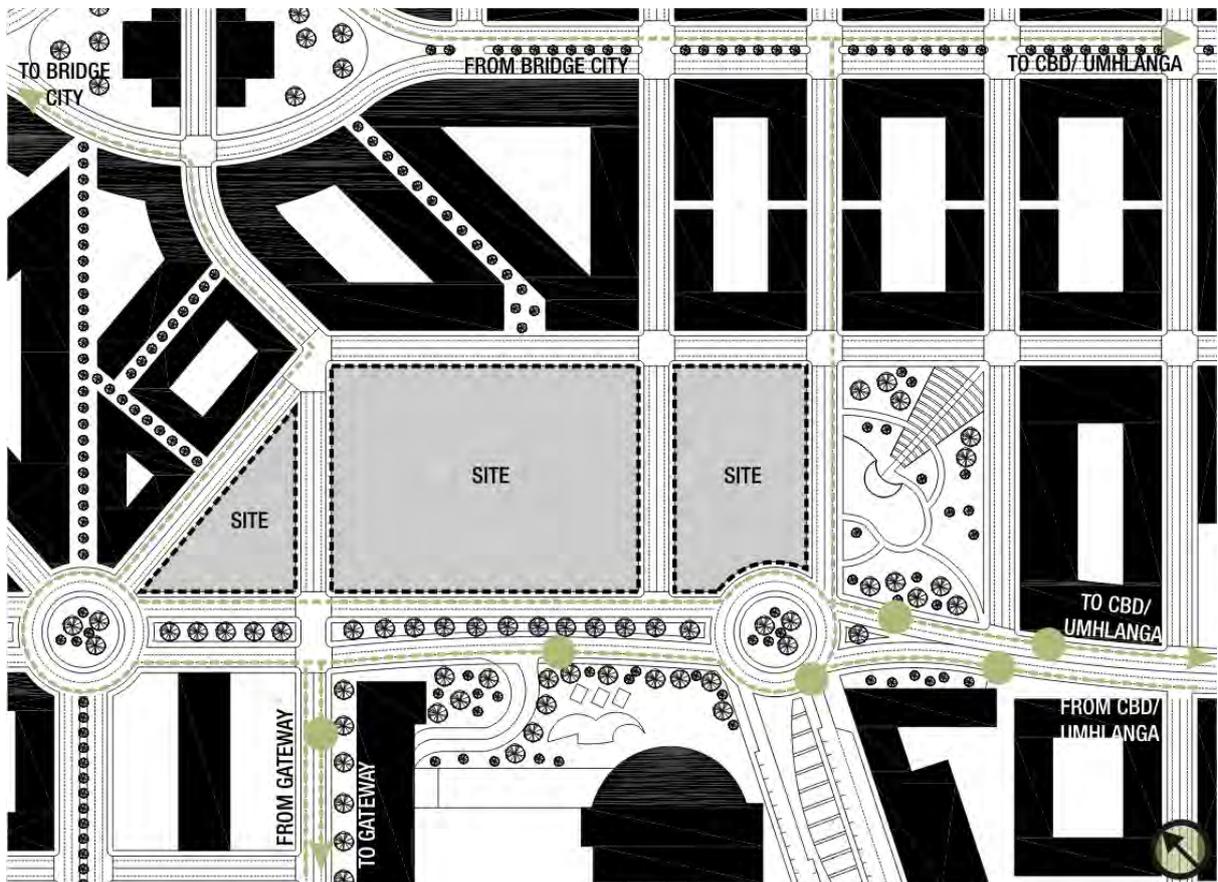


Figure 2.32- Existing and forecast minibus taxi routes as a result of the IRPTN. (Author)

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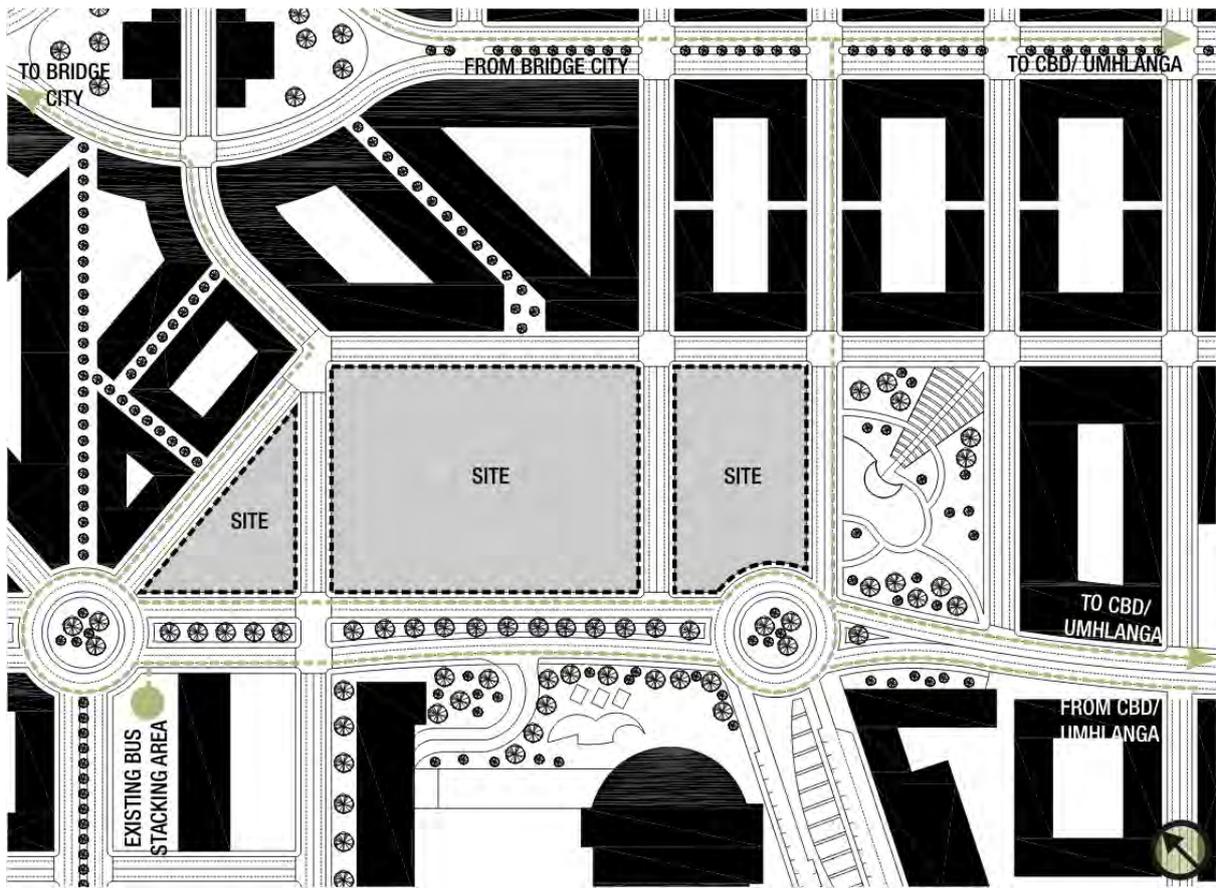


Figure 2.33- Existing and forecast Durban Transport and Metro Bus routes as a result of the IRPTN. (Author)

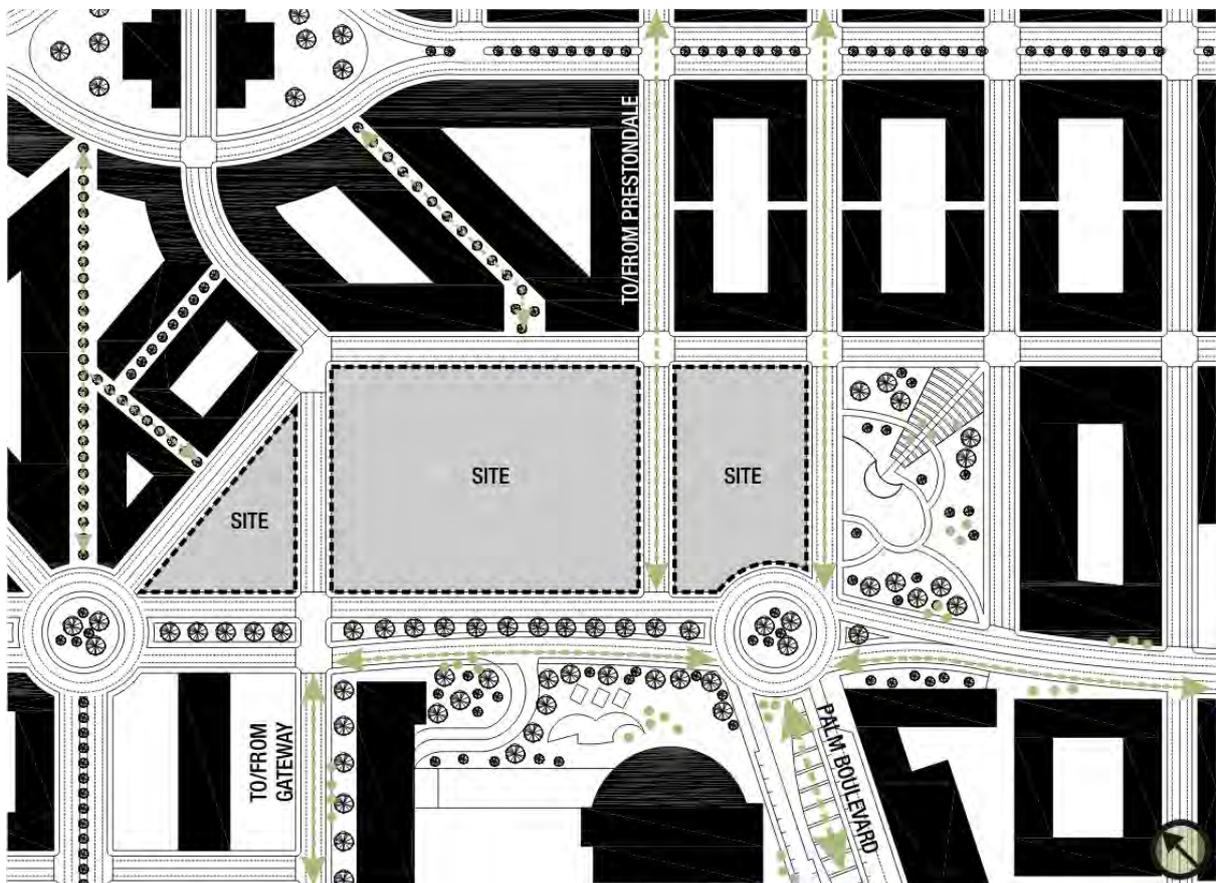


Figure 2.34- Existing pedestrian movement patterns and gathering points. (Author)

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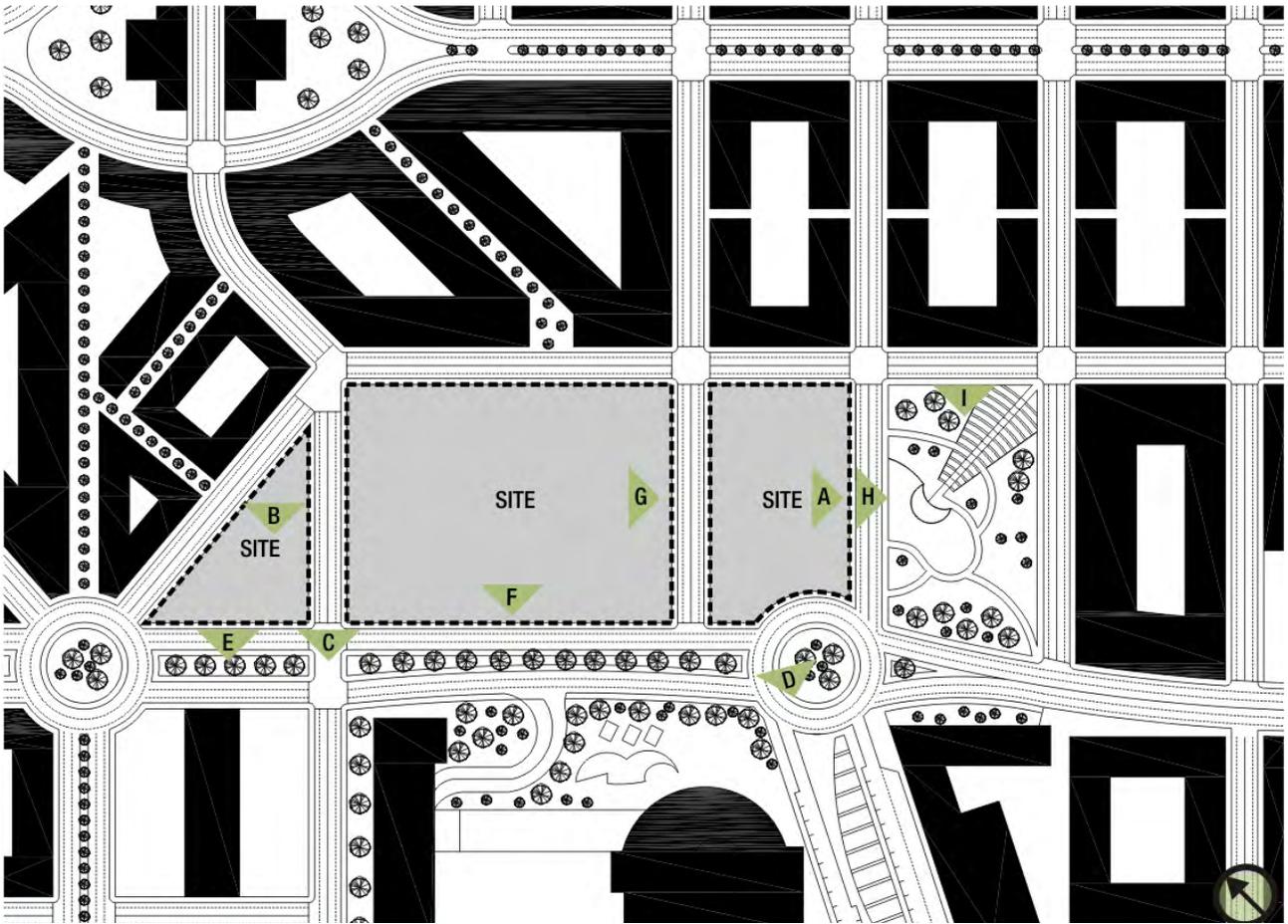


Figure 2.35- Location of photograph viewpoints. (Author)



Plate 2.36-2.39- Photographs reflecting current site conditions. (Author)

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Plate 40-44- Panoramic photographs reflecting current site conditions. (Author)

## 2.8 CONCLUSION

In looking at current issues surrounding public transport in the eThekweni Municipality and assessing current public transport trends and forecasts it was determined that the node in Umhlanga was growing at a drastic rate, and there was a severe need to look at the implementation of infrastructure that could deal with current and forecast demands, and redefine the identity of the industry at the same time.

In looking at the various options for the selection of a site, and through the urban analysis of Umhlanga and its surroundings, in particular the development of the Northern Corridor and the public transport plans for the area, the site opposite Gateway Shopping centre, in the heart of Umhlanga New Town, was deemed to be most appropriate in keeping with the preceding theoretical discourse.

A study into current transport infrastructure in the area shows how the industry is marginalized, with operators and commuters forced to the periphery of the precinct, excluded from the public realm, and in turn creating a disjointed and negative identity. The opportunity to resolve those issues and create a true inclusive public space, through the effective utilization of civic land available, within a predominately developer driven environment has been realised.

## **CHAPTER 3: DESIGN DEVELOPMENT AND RESOLUTION**

### **3.1 CONCEPTUAL AND THEORETICAL ISSUES**

#### **3.1.1 Introduction**

The purpose of this chapter is to illustrate how the theoretical discourse, the subsequent development of the project brief and the analysis of the chosen urban framework has informed the design of a transport interchange for Umhlanga New Town. This illustration begins with an understanding of the conceptual framework which has informed and lead to the development of the actual building. The urban design proposal and the concepts driving the design are detailed and illustrated and in the drawings to follow. The conceptual framework of the building itself is then explained and how the theoretical discourse ties into the building design

#### **3.1.2 Urban Design Conceptual Framework**

According to Erky Wood (2008: 51), Umhlanga New Town was developed around the principles of New Urbanism and as a result the focus of the design was to make a public environment that is:

- accessible to all
- is safe and convenient for pedestrians
- manners the private car into a subservient role
- is well landscaped, well lit, managed and maintained, and
- defines the complexity of a vibrant, mixed use node with a legibility and place-making that gives the area a distinctive identity.

Although the area is safe and convenient for pedestrians and is well landscaped, well lit, managed and maintained, this infrastructure is severely underutilized as the car becomes the primary mode of transport in the area. There is no consideration for other modes on non motorized transport including cycling with the majority of space adjacent the roads taken up by parking bays, provided over and above the excessive amounts of pay parking provided for Gateway Shopping Centre. It is proposed that this space given to parallel bays is converted to cycling lanes to create a sustainable non motorized transport network, forcing car users to pay for parking if the motor vehicle is their modal choice. Over and above these issues the area is characterized by large city blocks, lack of street activation, lack of hierarchy of elements,

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lack of legibility, no landmark features, lack of sufficient transport infrastructure and an unfiltered street network. One feels that there is a serious lack of place or genius loci and identity.

According to Steve Melia, a senior lecturer and PhD researcher in transport and planning at the University of West England, the New Urbanism movement has helped spread the concept that car use can be reduced by permeable street networks, which allow all road users to move unimpeded in all directions (Melia, 2008: 1). This phenomena he terms 'unfiltered permeability'. However the reality is quite the contrary. The traditional street grid reduces journey distance by foot, but also by car. Where all road users travel together, the car will generally emerge as the quickest and most convenient mode of transport. *"Maximising permeability for cars, making it easier for them to drive in all directions, will encourage people to walk and cycle. How did such an obvious delusion come so widely accepted?"* (Melia, 2008: 1).

The term 'filtered permeability' was coined by Melia and subsequently defined as follows:

*"Filtered permeability means separating the sustainable modes of transport from private motor traffic in order to give them an advantage in terms of speed, distance and convenience"* (Melia, 2011: 6).

Filtered permeability means deliberately restricting private car use, maximising walking, cycling and the use of public transport. Private car traffic is channelled onto a limited network of roads. As a result the most direct route is limited to non motorized transport and public transport, which the private car is forced to take a more indirect route.

The urban design also seeks to improve density within the immediate proximity of the site. The studies done in section 2.5 show that as a result of the large city block size in Umhlanga New Town, space is used ineffectively, with the majority of buildings having large, central courtyards that are under used and lack activation. By reducing the block size, one can still achieve the desired building footprint, but significantly reduce the wasted internal courtyard space. The increase in density in and around the site aims at creating a Transit Oriented Development, where density is at its peak within the immediate constraints of the site and filters off toward the edge of the 800 meter/ 10 minute walking radius.

Through the implementation of filtered permeability, reduction of the city block size and the increase in density the desired walkability can be achieved. Walkability is directly related to:

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- Street Connectivity
- Land Use Mix
- An appropriate residential density
- Transparency
- Appropriate city block size
- Passive Surveillance

Major infrastructural factors that influence walkability include:

- Access to mass transit
- Presence and quality of footpaths
- Buffers (on street parking, cycling lanes, landscaping)
- Street furniture
- Shade

By utilizing the three principles of filtered permeability, density and walkability, a better urban realm can be created that supports sustainable urban transport.

### **3.1.3 Architectural Design Conceptual Framework**

The building is to function as an urban node interchange. The way in which Umhlanga works as a node, is that it is a transition space along a route rather than rank or terminus. Short term holding facilities should be provided at a small scale for suburban minibus taxis which may take longer to fill. The building and the spaces it creates need to mirror the way the node functions. The primary aim is to facilitate the seamless transition of commuters between nodes. As a result the building is a short stay zone with the maximum envisaged waiting time been 20 minutes. The spaces should be clean, efficient and should prevent loitering from occurring. Retail facilities should be provided as passing trade for commuters. Destination trade occurs at Gateway Shopping Centre therefore creating a link between the interchange and the shopping centre is important.

Critical analysis of current infrastructure around South Africa and the subsequent case studies showed that interchanges tend to act in isolation, with no consideration to link to the greater transport network. As a result a fragmented network is created with no integration between modes. Interchanges have been designed around a specific commuter and operator, namely the lower to middle income black commuter and the minibus taxi operator. As a result

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interchanges in no way have to capacity to appeal to the wider spectrum of society, and transfer between modes is inconvenient and nonexistent.

In order to redefine the identity of the industry through an appropriate architectural response, five key principles were seen to be lacking in current infrastructure, and if resolved in the proposal, could redefine the architectural typology of transport infrastructure in South Africa and in turn appeal to a wider spectrum of society, creating a public transport model that becomes a mode of choice rather than mode of force. The building has an extremely important role to play in terms of the overall commuter experience. It becomes part of the overall journey undertaken by the commuter, and therefore if a redefined architectural typology can be created, then the identity of the public transport industry can be transformed. The five key principles are:

- Safety
- Security
- Legibility
- Comfort
- Convenience

**Safety:** Effectively separating pedestrians and vehicles in and around the site through effective planning and level changes. The creation of defined entrances to the building will allow the commuter ease of access, and create a network of movement, where pedestrians and vehicle can co-exist without impeding one another. Preventing commuters from walking large distances to transfer between modes which can become dangerous during later hours.

**Security:** Allowing for passive surveillance to occur through the effective design of spaces. Creation of a transparent facade that allows surveillance to occur from adjacent buildings and passer's by. Minimising the amount of dark spaces. Visual security through CCTV cameras and security guards.

**Legibility:** Creating an easy to identify network, allowing for visual way finding to occur, reducing the need for signage. Clearly marked central ticketing facility is key to a legible network.

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Comfort: Allowing for adequate walkways, staircases, escalators, lifts to deal with peak periods. Creation of well lit, ventilated waiting areas that allow and promote social interaction. Creation of defined passive and active zones, preventing clashes between the two

Convenience: Creating a network that allows for seamless transition between nodes. Allowing for all modes to occur under one roof providing for a variety of modal choices. creating direct links between modes that are unimpeded and clear.

The first impression the author obtained with both case studies was that the buildings were very introvert in style. All pedestrian and vehicular movement was internalized and as a result the external face of the building became bland and utilitarian. Public buildings need to display the functions occurring within, blurring the boundary between internal and external. Passer's by should be able to immediately identify with the building and the function that it provides. Unless the commuter actually entered the buildings they would be none the wiser as to what the functions were that occurred within. When one considers that primary element that people identify with transport is movement, one should be able to experience that movement both internally and externally. If one can redefine that movement process through an architectural response then the industry as a whole will benefit.

The concept of the building as a result is **Networks of Movement**. The idea is to mirror the traditional introvert style experienced in the case studies, externalizing the functions, capturing the unique blend of pedestrians, retail and vehicles that occur in a transport interchange. The various modal functions plug into the external face of the building while a central pedestrian spine with retail and circulation run down the centre. By moving vehicles to the periphery, space that would generally be taken up by vehicle circulation, ramps and turning circles can be given back to the creation of meaningful people spaces, rejecting the 'placelessness' that one tends to feel at traditional bus and taxi ranks.

All transport functions occur on the ground floor plate, preventing a vertical segregation from occurring between modes and maximising the legibility and convenience of the system. Administrative functions occur above, allowing the various transport sectors to survey respective movements from a good vantage point above, and at the same time freeing up the ground floor plate for retail opportunities and pedestrian movement. A legible system of 'active' transport functions occur on one plane while 'passive' administrative functions occur on another.

## **3.2 ENVIRONMENTAL DESIGN CONSIDERATIONS**

### **3.2.1 Introduction**

A green building is a building which is energy efficient, resource efficient and environmentally responsible- which incorporates design, construction and operational practices that significantly reduce or eliminate its negative impact on the environment and its occupants. Building green is an opportunity to use resources efficiently and address climate change while creating healthier and more productive environments for people to live and work in.

On a practical level, this encompasses the use of design, materials and technology to reduce energy and resource consumption and create improved human and natural environments. Specific green building measures include careful building design to reduce heat loads, maximise natural light and promote the circulation of fresh air; the use of energy-efficient air-conditioning and lighting; the use of environmentally friendly, non-toxic materials; the reduction of waste, and the use of recycled materials; water-efficient plumbing fittings and rainwater harvesting; the use of renewable energy sources; and sensitivity with regard to the impact of the development on the environment.

The benefits of green building can be broken up into three broad categories which correspond to the three spheres of sustainable development which are environmental, economic and social.

Environmental benefits:

- Enhance and protect ecosystems and biodiversity
- Improve air and water quality
- Reduce solid waste
- Conserve natural resources
- Reduce carbon emissions

Economic benefits:

- Reduce operating costs
- Enhance asset value and profits
- Improve employee productivity and satisfaction
- Optimize life-cycle economic performance

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### Health and community benefits:

- Improve air, thermal, and acoustic environments
- Enhance occupant comfort and health
- Minimize strain on local infrastructure
- Contribute to the enhancement of overall quality of life

The current mechanisms and regulations for promoting green building in South Africa are Green Star SA, The Energy Efficiency Strategy of the Republic of South Africa, SANS 10400 and SANS 204. As mentioned above, Green Star SA is a rating system which measures the environmental performance of buildings. SANS 10400 and SANS 204 are documents which outline energy efficiency standards for commercial buildings in South Africa. The Energy Efficiency Strategy of the Republic of South Africa is document that was produced by the Department of Minerals and Energy in March 2005. This document describes strategies that will be implemented to reduce energy demand by 12% by the year 2015.

The Green Star Rating system has divided the environmental performance of a building into eight different categories that are weighted according to how it will improve the overall environmental performance of the building. All these categories need to be addressed in during the design process if the building is to be environmentally sustainable. These categories are:

- Management
- Energy
- Land use and Ecology
- Indoor Environmental Quality
- Transport
- Emissions
- Water
- Materials

### **3.2.2 Green Building Strategies**

The issues around sustainability will be approached with the mindset of implementing passive design strategies to reduce the impact the development has on the natural environment. The basic principles of good design will be employed to ensure that the building responds to prevailing conditions to ensure that mechanical interventions are kept to a minimum. The starting point for this should be the building envelope.

#### **Building Envelope**

Building envelope should be:

- Responsive
- Dynamic
- Controllable

#### **Performance Objectives of the Building Envelope:**

- Maximize opportunities to use daylight as the sole ambient light source
- Maximize opportunities for natural ventilation
- Minimize entry of direct sunlight and glare
- Use SANS 10400 standards as a minimum requirement
- Air tightness exceeding SANS 204 standards by optimizing insulation levels in the building envelope
- Incorporating high performance glazing and window systems into the façade design
- Ensure that exterior noises are not experienced in the interior of the building
- Promote a good quality indoor environment
- Promote energy efficiency and exceed the standards of SANS 204
- Provide occupants with a direct view of the outside
- Solar shading with horizontal configuration on the northern façade
- Solar shading with vertical configuration on the eastern and western facades

## **Materials**

Materials will be selected on the basis of how the material assists in achieving the performance requirements of the building envelope. The criteria for material selection will be:

- Air tightness
- Insulation
- Aesthetic value

Materials would also be sourced for local manufactures as far as possible. The embodied energy of each material must also be taken into account. Materials must also be obtained from sustainable sources such as sustainably harvested timber.

## **Glazing and Windows**

Glazing on the buildings will be informed by SANS 10400. The area of glazing on the façade must find a balance between allowing as much daylight in as possible while reducing heat gain and glare. This can be achieved by increasing U-Values by using double glazing in the façade.

Location of windows and glazing is also an important aspect of an efficient building envelope. Placing glazed areas on the eastern and western facades will result in unwanted heat gains and will therefore be avoided. Paying attention to the sun path and positioning glazing and shading accordingly will result in a much more efficient building envelope.

In order to achieve efficient and effective natural ventilation, the area of opening sections of the building façade (windows and doors) should be equal to 5% of the floor area of the building. Windows and doors will aid in both stack effect ventilation and cross ventilation. Windows must also be designed in such a way that occupants have control over their local environment. This can be achieved by providing at least one opening per 5m of façade.

In addition to designing a high performance and efficient building envelope, the architect must design the buildings to be resource efficient especially in terms of water and energy. The following strategies will be applied at a building scale and at a precinct scale to reduce water and energy consumption.

## **Water**

There is great potential to integrate strategies for the conservation of potable water and the reuse of non-potable water. These strategies include:

### Low-Water-Use Fixtures

- Use low-flow toilets
- Use waterless urinals
- Use low-flow taps

### Rainwater Collection

- Collect and store rainwater for non-potable purposes

### Wastewater and Grey water Recycling

- Design buildings to use treated wastewater for non-potable uses
- Plumb buildings to accommodate grey water separation

### On-site Water Treatment

- Integrate an on-site sewage treatment plant and investigate the viability of black water recycling
- Integrate on-site wastewater treatment system with landscape design
- These on-site treatment plants should service the entire precinct

### Runoff Reduction

- Use planted features instead of gutters to manage storm water runoff
- These landscaping features must be planted with indigenous vegetation

## **Energy**

The issue of energy must be approached from two angles. The first approach must be to design buildings that are energy efficient and have lower energy demands than conventional buildings. The second approach is to source as much energy as possible from renewable sources.

Energy efficiency and load reduction can be achieved in the development by implementing the following strategies.

- Pay attention to the orientation of the building in relation to prevailing climatic conditions and the sun path
- Optimize insulation levels in building envelopes
- Eliminate thermal bridging
- Incorporate passive solar shadings into the facade design
- Design the building to maximize opportunities of passive ventilation
- Incorporating high performance glazing and window systems into building facades
- Incorporate thermal mass into the design
- Utilize appliances and furnishings with superior energy efficiency
- Utilize solar powered geysers
- Utilize low flow hot water plumbing fixtures
- Daylight should be used as far as possible as the sole ambient light source
- Utilize ultra-high-efficiency LED light fittings
- Incorporate energy efficient air-conditioning systems into the building design

Although it is unrealistic to think that the energy demands of the development can be met solely from renewable sources, significant efforts will be made to integrate on-site energy generating technologies such as photovoltaic panels and wind turbines into the development to reduce the load it places on the commercial power grid. In this way, the carbon footprint of the entire development will be greatly reduced and the overall sustainability will be improved.

### **3.2.3 Conclusion**

The long term sustainability of the development should be seen as going hand in hand with the design. Being mindful of environmental, economic and social concerns during the design phase will result in the overall sustainability of the development in years to come.

Technologies, strategies and materials that can be used to improve the overall sustainability of the development will be considered and implemented during the design phase. In this way the development is proactive in mitigating its' environmental and social impacts from the outset rather than reacting to problems which it might cause in the future.

**REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct**

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## **APPENDICES**

### **FORMAL QUESTIONNAIRE**

The formal questionnaire/survey was not used except as a reference for unstructured interviews. The researcher felt that allowing conversations to shape organically through discussion would allow for a greater understanding of the answers and issues at hand. This was proven correct as subjects were able to express themselves in ways not possible when putting pen to paper. It opened up useful avenues for further research and consideration.

A majority of the questions posed in the questionnaire/survey were found to be similar to those found in the National Household Transport Survey (2003) and the Integrated Transport Plan 2010-2015, eThekweni Municipality (2010). The large amount of statistical information gained from these reports was deemed sufficient for the study.

**INFORMED CONSENT FORM**

I, ..... acknowledge that I have been informed that Geoffrey Richards, student number 204509828, is a registered final year Master’s student in Architecture at the University of KwaZulu-Natal. He is conducting research on the design of a Transport Interchange as part of his dissertation, and the interviews I am participating in are aimed at supplementing this research. The information gathered is solely to be used in this regard towards the design of a Transport Interchange.

I understand that participation in this research is purely voluntary. I am under no obligation to participate and may cease my participation at any time as I see fit. There are also no reward/benefits given for participating in the research. I further understand that he is bound by university policy to use this information ethically and confidentially and to store it securely. My response may be acknowledged unless I request confidentiality.

I have been informed that I am free to contact the dissertation supervisors as follows for further information.

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E-mail: mthembeni@techso.co.za

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct**

**A: Umhlanga New Town Survey**

Please enter the details of the area in the space provided.

Site Name: \_\_\_\_\_

Street Name: \_\_\_\_\_

**B: About your visits**

1. 1a How often do you visit the area? (Please tick one only)

- Daily
- 2 or 3 times a week
- Once a month
- Once a year
- Other

1b How often do you visit the area? (Please tick one per season)

- |                                    | Winter(generally cold and wet) | Summer(generally warm and dry) |
|------------------------------------|--------------------------------|--------------------------------|
| Seldom or never during this season | <input type="checkbox"/>       | <input type="checkbox"/>       |
| Once a month                       | <input type="checkbox"/>       | <input type="checkbox"/>       |
| Once or twice a week               | <input type="checkbox"/>       | <input type="checkbox"/>       |
| Most days                          | <input type="checkbox"/>       | <input type="checkbox"/>       |
| Every day                          | <input type="checkbox"/>       | <input type="checkbox"/>       |

2a In Winter, how long to you normally stay? (Please tick one for weekday and one for weekends)

- | Duration             | Weekday                  | Weekend                  |
|----------------------|--------------------------|--------------------------|
| Do not visit         | <input type="checkbox"/> | <input type="checkbox"/> |
| Less than 30 minutes | <input type="checkbox"/> | <input type="checkbox"/> |
| 30 minutes - 1 hour  | <input type="checkbox"/> | <input type="checkbox"/> |
| 1 - 2 hours          | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 - 4 hours          | <input type="checkbox"/> | <input type="checkbox"/> |
| More than 4 hours    | <input type="checkbox"/> | <input type="checkbox"/> |

2b In Summer, how long do you normally stay? (Please tick one for weekdays and one for weekends)

- | Duration             | Weekday                  | Weekend                  |
|----------------------|--------------------------|--------------------------|
| Do not visit         | <input type="checkbox"/> | <input type="checkbox"/> |
| Less than 30 minutes | <input type="checkbox"/> | <input type="checkbox"/> |
| 30 minutes - 1 hour  | <input type="checkbox"/> | <input type="checkbox"/> |
| 1 - 2 hours          | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 - 4 hours          | <input type="checkbox"/> | <input type="checkbox"/> |
| More than 4 hours    | <input type="checkbox"/> | <input type="checkbox"/> |

3. When you visit the area, where do you usually travel from? (Please tick one only)

- Home     Hotel     Work     School     Shops     College/ University

Other (please specify) \_\_\_\_\_

# REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct

4. How would you normally travel to the area? (Please tick one only)

On foot	<input type="checkbox"/>	Bicycle	<input type="checkbox"/>	Motorbike	<input type="checkbox"/>
Car	<input type="checkbox"/>	Bus	<input type="checkbox"/>	Coach	<input type="checkbox"/>
Taxi	<input type="checkbox"/>	Train	<input type="checkbox"/>	Boat	<input type="checkbox"/>

Other (please specify) \_\_\_\_\_

5. How long does your journey take? (Please tick one only)

less than 5 minutes	5 - 10 minutes	10 - 15 minutes	15 - 20 minutes	20 - 30 minutes	More than 30 minutes
<input type="checkbox"/>					

6. 6a Do you normally visit the area alone or in a group? (Please tick one)

Alone	In a group	Both (equally divided)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6b When you visit as part of a group, who usually visits the area with you? (Please tick as many as appropriate)

Partner	<input type="checkbox"/>	Children	<input type="checkbox"/>	Other family	<input type="checkbox"/>
Friends	<input type="checkbox"/>	Team/ Club	<input type="checkbox"/>	School group	<input type="checkbox"/>

Other (please specify) \_\_\_\_\_

6c Including yourself, how many people would normally be with you when you visit the area as part of a group? (Please enter numbers for each age group. See example below)

	Children (0 - 12)	Teenagers (13 - 17)	Adults (18 - 60)	Senior Citizens (60+)
Male	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Female	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Example**  
 If you are a male and you visit the area with one female adult and two male children under the age of 12, your form should read as below

	Children (0 - 12)	Teenagers (13 - 17)	Adults (18 - 60)	Senior Citizens (60+)
Male	<input type="text" value="2"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text"/>
Female	<input type="text"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text"/>

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7. What do you normally do when you visit the area? (Please tick up to five)

To relax or think	<input type="checkbox"/>	For peace and quiet	<input type="checkbox"/>	Enjoy the surroundings	<input type="checkbox"/>
See the sea	<input type="checkbox"/>	Get some fresh air	<input type="checkbox"/>	Go for a walk	<input type="checkbox"/>
Ride a bike	<input type="checkbox"/>	Walk the dog	<input type="checkbox"/>	Children/ family outing	<input type="checkbox"/>
Meet friends	<input type="checkbox"/>	Gateway	<input type="checkbox"/>	Gondola Ride	<input type="checkbox"/>
Picnic / Braai	<input type="checkbox"/>	To eat / drink	<input type="checkbox"/>	Enjoy entertainment	<input type="checkbox"/>
Attend events	<input type="checkbox"/>	To keep fit	<input type="checkbox"/>	Swim	<input type="checkbox"/>
Fishing	<input type="checkbox"/>	Water sports	<input type="checkbox"/>	Improve my health	<input type="checkbox"/>
Organised education visit	<input type="checkbox"/>	Guided walks or tours	<input type="checkbox"/>	Watch sports or games	<input type="checkbox"/>
Visit people living in the area	<input type="checkbox"/>	Work	<input type="checkbox"/>		

Other (please specify) \_\_\_\_\_  
 Other (Please specify) \_\_\_\_\_  
 Other (Please specify) \_\_\_\_\_

## C: About your visits

We want to know your feelings about the development. It is welcoming? Do you feel safe? Is the area well maintained? Is it successful?

1. How would you rate the design and appearance of the precinct? (Please tick one only)

Very Good    Good    Fair    Poor    Very poor    No opinion    Don't know

Comments:

\_\_\_\_\_

\_\_\_\_\_

2. How would you rate the standard of cleanliness and maintenance of the area? (Please tick one only)

Very Good    Good    Fair    Poor    Very poor    No opinion    Don't know

Comments:

\_\_\_\_\_

\_\_\_\_\_

3. How easy is it for you to get around and navigate the area? (Please tick one only)

Very Good    Good    Fair    Poor    Very poor    No opinion    Don't know

Comments:

\_\_\_\_\_

\_\_\_\_\_

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4. What do you think of the range of facilities available to you the visitor? (Please tick one only)

Very Good      Good      Fair      Poor      Very poor      No opinion      Don't know  
                                   

Comments:

---

---

5. Do you feel safe when visiting the area? (Please tick one only)

Yes      No      Sometimes      No opinion      Don't know  
                       

Comments:

---

---

6. How would you rate the quality and number of public spaces and squares in the area? (Please tick one only)

Very Good      Good      Fair      Poor      Very poor      No opinion      Don't know  
                                   

Comments:

---

---

7. How would you rate the facilities and/ or services that are provided for families? (Please tick one only)

Very Good      Good      Fair      Poor      Very poor      No opinion      Don't know  
                                   

Comments:

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8. Do you think the current development in the area has been a success? (Please tick one only)

Yes      No      No opinion      Don't know  
                 

Comments:

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# REDEFINING THE PUBLIC TRANSPORT INDUSTRY THROUGH ARCHITECTURAL IDENTITY: A Proposed Transport Interchange for The Umhlanga New Town Precinct

9. What is your overall impression of the area? (Please tick one only)
- |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very Good                | Good                     | Fair                     | Poor                     | Very poor                | No opinion               | Don't know               |
| <input type="checkbox"/> |

Comments:

---

---

10. Can you think of anything that would encourage you to visit the area more often? (Please tick one only)
- |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|
| Yes                      | No                       | Don't know               |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

If yes, please describe below:

---

---

11. Would better access to public transport in the area be beneficial to you? (Please tick one only)
- |                          |                          |
|--------------------------|--------------------------|
| Yes                      | No                       |
| <input type="checkbox"/> | <input type="checkbox"/> |

Comments:

---

---

## D: About you

1. Which of the following best describes your age? (Please tick one only)
- |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 16 or under              | 17-19                    | 20-29                    | 30-39                    | 40-49                    | 50-59                    | 60-75 and over           |
| <input type="checkbox"/> |

2. Are you male or female? (Please tick one only)
- |                          |                          |
|--------------------------|--------------------------|
| Female                   | Male                     |
| <input type="checkbox"/> | <input type="checkbox"/> |

3. Ethnicity? (Please tick one only)
- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Black                    | White                    | Indian                   | Coloured                 | Other                    |
| <input type="checkbox"/> |

**DESIGN PROPOSAL  
FINAL DRAWINGS**