



# **Tshwane City Central**

Taxi transfer terminal and market.

# 0.1 Introduction

## 0.1 Background

In the next hundred years urbanisation of the world population will increase from 60,1% to 80%. Tshwane is no exception to this. By 2025 the city's population is estimated to increase by 30% from 2000 population levels (GTS2000). This steady immigration of rural people to Tshwane has amplified demand on all existing infrastructure services and especially transportation. Be it private vehicle or public transport, people must be able to commute within the city.

During 1995 to 2003 Tshwane had experienced rapid economic growth of 4,6% per annum. This eight year period resulted in an increase in peoples ability to purchase vehicles. Due to the unattractiveness and inconvenience of public transportation, more people bought their own vehicles inevitably leading to greater congestion on roads. (City of Tshwane, Strategic Public Transport Plan:35)

A lack of vacant urban space and financial resources makes it a near impossibility to continue addressing the congestion problem through the building of more roads. Government's focus will have to shift to developing public transportation as a viable alternative for commuters.

In recent years, facilities for public transport have deteriorated, and funding for operating security and maintenance of existing public transport facilities is difficult. Currently, Tshwane alone uses 30% of the national transportation subsidy (City of Tshwane, Strategic Public Transport Plan:35), thus emphasising the need for facilities to produce enough income to maintain themselves and ensure their future.

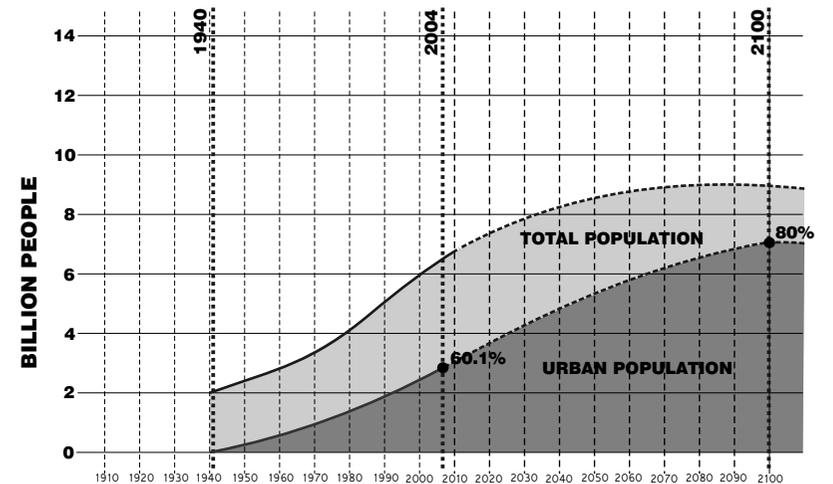
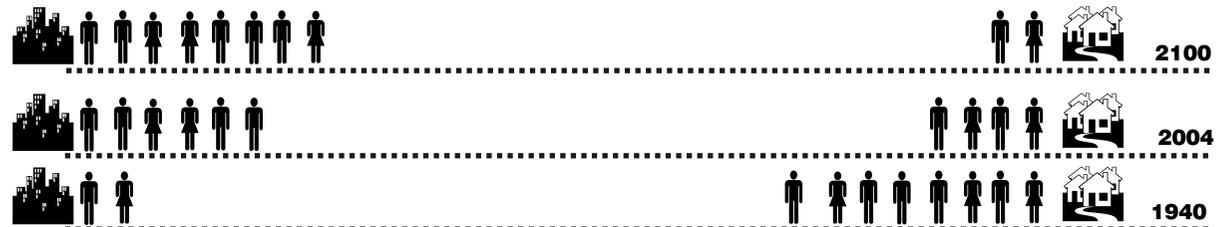


Table 0\_01 Urban population projections by the United Nations



0\_03 Urban population projection ratio

## 0.2 Future Developments

New opportunities and developments have recently emerged, aiding the upgrading of the public transportation infrastructure.

### Gautrain

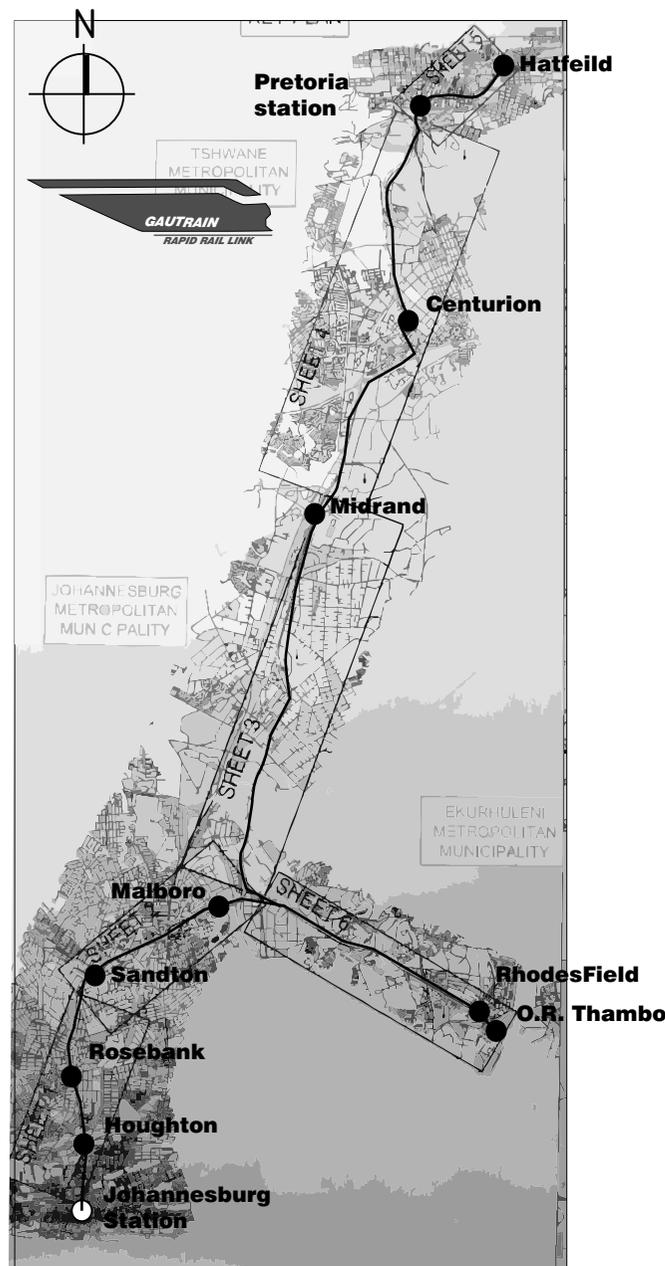
The introduction of the Gautrain will improve the perception of public transport being only for the poor. It is a modern high speed light rail that links O.R Tambo International Airport with various stations in Johannesburg, Midrand, Centurion and Pretoria (Vide figure 0\_04).

### Taxi Recapitalisation Programme

Using a R7,7 billion incentive programme, through which central government intends to modernise the taxi industry by purchasing old taxi's for R50,000 each. This will assist operators in obtaining new vehicles, and removing old unsafe vehicle off the road (www.engineeringnews.co.za).

### FIFA World Cup 2010

R3,5 billion has been budgeted for large scale improvements on roads and public transportation systems. The upgrade will accommodate an estimated three million international visitors to South Africa for the football tournament (www.fifaworldcup.co.za).



0\_04 Gautrain rapid rail link key map



0\_05 Taxi driving



0\_06 FIFA world cup logo

### 0.3 Socio - economic trends

The Tshwane Municipality is in most, if not all, aspects the model Apartheid city, split in two components. The first one is a powerful economic power house, located in the centre. The second component is poor and under-developed peripheral townships, where a deprived workforce dwells. These townships have little job opportunities and even less amenities. (TSDS:02)

Everyday workers are required to commute into the cities, some even wasting three hours on traveling to work. The unemployed, living in these dissociated townships, are evidently removed from any economic opportunities and are unlikely to find any jobs or even to succeed in casual trading (TSDS:18).

The *Tshwane Spatial Development Strategy: 2010 and Beyond* (TSDS), has identified these economic inequalities. The TSDS states that Tshwane's developments should focus more on the immediate areas around Pretoria, rather than scattered investment following the current socio-political trend.

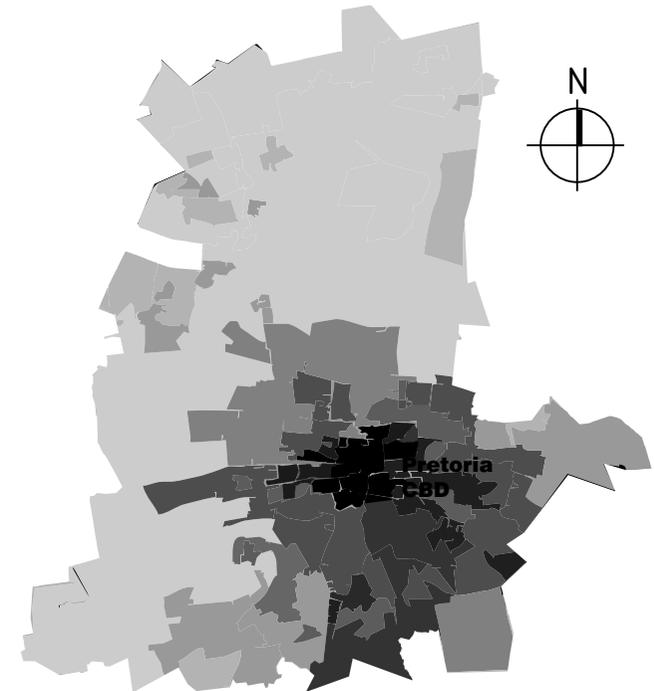
The TSDS argues that splitting investment equally to all the previously disadvantaged sectors will result in only a partial development of these areas. Such approach would hinder economic sustainability and would eventually cost Tshwane more in transportation and unemployment subsidies.

The TSDS strategy aims to restructure the current demographic displacement, (*Vide* figure 0\_07) and promote a hypothetical scenario as graphically shown in figure 0\_06, assuming no racial separation was imposed.

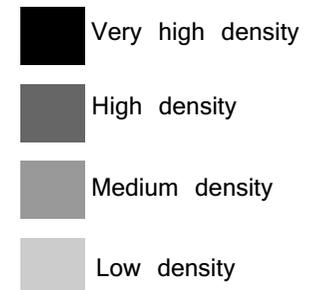
In this scenario, high density residential developments would be intensified within a 10km radius of Pretoria, infrastructure can then be concentrated and travelling distances reduced. The result would be a more sustainable city.



0\_07 Current population densities in Tshwane



1\_06 Hypothetical population densities of Tshwane if racial segregation had not occurred.



## 0.4 Dissertation aims and objectives

The aim of this dissertation is to promote public transportation by creating an effective terminal facility accessible to all commuters and creating an identifiable landmark within the city. The facility must have adequate services to support users, such as taxi operators, commuters, tenants, traders and the general city dwellers.

Construction of the terminal will be funded by government's budget allocated to upgrading of public transport. The facility will subsequently generate an income through rent from shops, kiosks, hotels and other commercial activities, allowing the terminal financial sustainability. It must promote safety and convenience to the commuter thereby improving comfort.

The terminal must offer a public transport infrastructure that will be more advantageous than private transportation, eventually encourage medium and high income population sectors to start using public transportation. Sustained flow of passengers will increase economic opportunity to traders.

The methodology for the research of this dissertation will be based on the grounded theory. Factual information will be gathered from similar projects that have been built in recent years and are located around the country.

These terminals have allowed South African culture to adapt itself to these types of interventions. Through a qualitative analysis, This dissertation will reveal findings, concepts and hypotheses, that will form a base for the philosophy and finally the design of an integrated commuter centre.

**Project:** Taxi terminal  
**Client:** Government  
**User:** Taxi operators  
 Commuters  
 Traders



O\_09 Informal traders at work



*“Picture this: by 2014, South Africa’s crime rate will plummet, affirmative action won’t exist, townships will become suburbs, and more than 50% of the adult population will own a business”.*  
(Guy Lundy: January 2007)

*This is the scenario painted by futurists and the country’s planners on what South Africa will look like in seven years when voters go to the polls for its fifth democratic general elections.*

(Futurists paint a picture of health by 2014, Sunday Times, 28 January 2007)



# Tshwane City Central

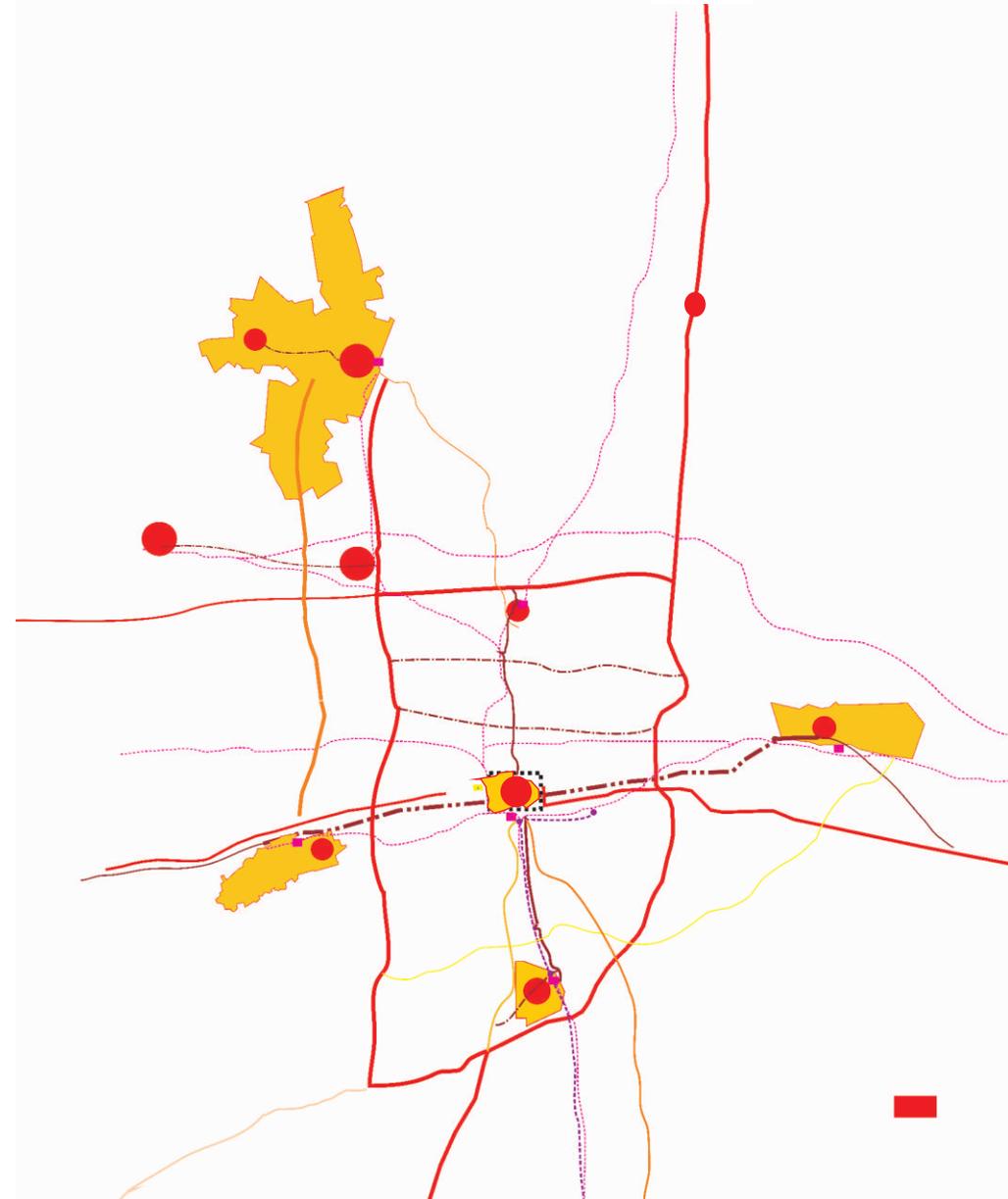
Taxi transfer terminal and market, applying architecture to socio-economic development.

By Jan Ladislav Peska

Submitted in fulfillment of part of the requirements for the Degree of Magister in Architecture (professional) in the faculty of Engineering, Built Environment and Information Technology.

University of Pretoria,  
Department of Architecture.

Mentor: Nicholas John Clarke



0\_01 Highlighted road system of Tshwane.

## Preface

South Africa's growing economy is contributing to an increase in individual wealth allowing for private vehicle ownership, which has resulted in escalating demands for the construction of additional roads. However, a shortage of area and funding is forcing government to increase its attempts at upgrading public transportation facilities. Thus public transport is strongly viewed as a viable alternative.

Approximately a sixth of public transportation is reliant on the mini-bus taxi industry, therefore formalisation of this mode of transportation is necessary. This can primarily be achieved, through the construction of new facilities, such as junction terminals and other interfaces between commuters and taxis. This will improve customer convenience and enhance the reputation of the industry.

An increased number of commuters will require added conveniences such as retail and food stalls. The newly given opportunity will allow informal traders to capitalise on this escalation. (*Vide Annexure A*).



0\_02 The trader.



<b>0.2 Contents</b>			
<b>0.1 Preface</b>	<b>iii</b>	<b>3.0 Design development</b>	<b>30</b>
<b>0.3 List of figures</b>	<b>v</b>	3.1 Design criteria	
<b>0.3 Definitions</b>	<b>vii</b>	3.2 Concept	
<b>0.0 introduction</b>	<b>01</b>	3.3 Accommodation schedule	
0.1 Background		3.4 Movement diagrams	
0.2 Future projects		3.5 Design generators	
0.3 Socio-political trends		3.6 Planning	
0.4 Dissertation aims and objectives		3.6 Movement	
<b>1.0 Contextual analysis</b>	<b>05</b>	3.6 Roof structure	
1.1 Tshwane		3.6 Elevations	
1.2 Public transport network criteria		3.6 Development model	
1.3 Pretoria		3.7 Ventilation	
1.4 Proposed inner city bus distributor		3.7 Ventilation simulation	
1.5 Activity spines		3.7 Water harvesting	
1.6 Pretoria, north precinct		3.7 Large screen displays	
1.7 Proposed urban design frameworks		3.7 Raised walkway	
1.8 The site		3.7 Traders market	
1.9 Site movement		3.7 Yotels	
1.10 Visual context		<b>4.0 Design presentation</b>	<b>59</b>
1.11 Visual context analysis		4.1 Plans	
1.12 Site climate		4.2 Sections	
<b>2.0 Case studies and precedents</b>	<b>20</b>	4.3 Elevations	
2.1 Bree Street Metro Mall, Johannesburg		4.4 Details	
2.2 Baragwanath Transport Interchange and Traders Market, Soweto		4.5 model	
2.3 Joe Gqabi Transportation Terminal, Phillipi, Cape Town		<b>5.0 Costing</b>	<b>90</b>
2.4 Precedents		<b>6.0 Conclusion</b>	<b>93</b>
		<b>Appendix</b>	

## List of Figures

### 0.0 Introduction

- 0\_01 Highlighted road system of Tshwane. Nothnagel W, 2006
- 0\_02 The trader. Authors
- 0\_03 Urban Population Projection (www.earthtrends.org)
- 0\_04 Gautrain rapid rail link key plan,  
Geological dept, UP: adapted by author
- 0\_05 Taxi driving. Author
- 0\_06 FIFA world cup logo (www.fifaworldcup.co.za)
- 0\_07 Hypothetical population location of Tshwane if segregation had not occurred. Author
- 0\_08 Current population densities
- 0\_09 Traders at work

### 1.0 Contextual analysis

- 1\_01 Gauteng economic corridor. Tshwane Spatial development strategy, City of Tshwane:3
- 1\_02 Highlighted road system of Tshwane  
Geological dept, UP: adapted by author
- 1\_03 Inner city movement network. Author
- 1\_04 Main Nodes of transport and commuter movement network. Author
- 1\_05 Street shot of v/d Walt. Author
- 1\_06 Proposed perspective of Bloed Street mall.  
Tshwane Update issue 2. City of Tshwane Munitoria
- 1\_07 Areal Photograph of north CBD  
Geological dept, UP: adapted by author
- 1\_08 Areal Photograph of north of Church square.  
Geological dept, UP: adapted by author
- 1\_09 Conceptual Sketch for Paul Kruger Urban Frame work. Author
- 1\_10 Current section through Paul Kruger. Author
- 1\_11 Phase 1 section through Paul Kruger. Author
- 1\_12 Phase 2 section through Paul Kruger. Author
- 1\_13 Conceptual Sketch for Grand Parade Urban Frame work. Author
- 1\_14 Current section through Grand parade. du Preez P.
- 1\_15 Phase 1 section through Grand parade. du Preez P.
- 1\_16 Phase 2 section through Grand parade. du Preez P.

- 1\_17 Site locality plan–Aerial Photograph  
Geological dept, UP: adapted by author
- 1\_18 Site Aerial Photograph.  
Geological dept, UP: adapted by author
- 1\_19 Pedestrian movement. Author
- 1\_20–1\_31 Site Photographs. Author
- 1\_32–1\_39 Visual analysis. Author
- 1\_40 Sun angles effect on skyligh. Author

### 2.0 Case studies and precedents

- 2\_01 Bree Street Metro Mall. Author
- 2\_02 Bara Mall and Market. Author
- 2\_03 Joe Gqabi Transport Terminus. Author
- 2\_04–2\_13 Photographs from site visit. Author
- 2\_14 Bara Mall phasing plan.  
Digest of South African Architecture 2006/2007:044–49
- 2\_15–2\_29 Photographs from site visit. Author
- 2\_30 Joe Gqabi Transport Terminus key plan. Site photograph. Author
- 2\_31–46 Photographs from site visit. Author
- 2\_47 Nyanga junction. photgraph. Levatan.R
- 2\_48 The Bridge. Hawkin B.
- 2\_49 Crown Fountain. Breazley M. *New Urban spaces* :99
- 2\_50 Plan of Sculpture of Taglaitti. Florensky, O: 44
- 2\_51 Street plan of Taglaitti. Florensky, O: 44
- 2\_52 Tabs Form web. [www.yotel.com](http://www.yotel.com)

### 3.0 Design development

- 3\_01 Battery platform system plan. Scale 1:250. Author
- 3\_02 Elevation of Battery platform system. Scale 1:100. Author
- 3\_03 Taxi weaving. Author
- 3\_04 Taxi turning circle. Author
- 3\_05 Section through 4 breast walkway. Scale 1:100. Author
- 3\_06 Visual landmark. Scale 1:100. Author
- 3\_07 Visual landmark tower. Scale 1:200. Author



3\_08 Passive surveillance. Scale 1:100. Author  
3\_09 Traders communal area Scale 1:100. Author  
3\_10 Typical material usage. Scale 1:100. Author  
3\_11 Graphic concept of image of a place. Author  
3\_12 The landmark towers. Author  
3\_13 Preliminary sketch of elevations. Author  
3\_14 Conceptual model. Author  
3\_15 Movement through the site. Author  
3\_16 Activity spine through the site. Author  
3\_17 Preliminary model compilation. Author  
3\_18 Plan development 1. Author  
3\_19 Plan development 2. Author  
3\_20 Plan development 3. Author  
3\_21 Preliminary site sketch. Author  
3\_22 Detailed preliminary site sketch. Author  
3\_23 Vertical movement of modes. Author  
3\_24 Preliminary movement sketch. Author  
3\_25 Preliminary sketch of building form. Author  
3\_26 Preliminary sketch of roof structure. Author  
3\_27 Suspended roof sketch. Author  
3\_28 Underside of roof. Author  
3\_29 Internal design proposal. Author  
3\_30 Roof model compilation. Author  
3\_31 Roof model four. Author  
3\_32 Roof model four compilation. Author  
3\_33 Roof model five compilation. Author  
3\_34 Vent towers used as light wells. Author  
3\_35 Tapered Pipe. Hassan, G. 1996:7  
3\_36 Tapered and stack towers Intended flow diagram. Author  
3\_37 Intended cross ventilation diagram. Author  
3\_38 South inlet tower intended flow diagram. Author  
3\_39 LED pixel modules. [www.howstuffworks.com](http://www.howstuffworks.com)  
3\_40 LED Self contained unit. [www.eurodisplay.com](http://www.eurodisplay.com)

3\_40 Perspex model. Author  
3\_41 Air convection diagram  
3\_42 Wind effect on flow diagram  
3\_43 LED Pixel modules. [www.howstuffworks.com](http://www.howstuffworks.com)  
3\_44 LED Self contained unit. [www.eurodisplay.com](http://www.eurodisplay.com)  
3\_45 Section through raised walkway. Author  
3\_46 Compilation of interim model. Author  
3\_47 Conceptual sketch of shade netting suspended from light posts. Author  
3\_48 Conceptual sketch of shade netting in plan view . Author  
3\_49 Drill Hall, Johannesburg. Photograph by Author  
3\_50 Preliminary Axonometric sketch of room. Author  
3\_51 Preliminary sketch of bed pod. Author  
3\_52 Preliminary Axonometric sketch of bed pod. Author  
3\_53 Preliminary sketch of room plan. Author  
3\_54 East elevation sketch. Author  
3\_55 East elevation sketch 2. Author  
3\_56 South elevation sketch. Author  
3\_57 South elevation sketch 2. Author  
3\_58 Design development model compilation. Author

## 4.0 Design presentation

4\_01 Final model compilation 1  
4\_02 Final model compilation 2  
4\_03 Final model compilation 3  
4\_04 Final model compilation - Light effect

## List of Tables

- 0\_01 Urban Population Projections by the United Nations United Nations Population  
[www.earthtrends.org](http://www.earthtrends.org).Adapted by Author.
- 1\_01 Criteria for transportation network. Tshwane. Strategic public transport plan. Author.
- 1\_02 Number of people in morning peak traffic. Author.
- 1\_03 Overall budget for the PICD. Refer to annexure A. Author.
- 1\_04 Average annual rainfall. Author. Based on information from [www.weatersa.co.za](http://www.weatersa.co.za)
- 3\_01 Commuter population. Author.
- 3\_02 Taxi Population. Author.
- 3\_03 Retail population. Author.
- 3\_04 Ablutions – males. Author.
- 3\_05 Ablutions – female. Author.
- 3\_06 Yotel population. Author.
- 3\_07 LED screen sizing. [www.howstuffworks.com](http://www.howstuffworks.com)
- 5\_01 Costing schedule. Author.

## Definitions

Tshwane: Greater municipality of Tshwane

Pretoria: Central business district of Tshwane

Taxi: Mini-bus Taxi including operator

Trader: An informal trader or hawker, operating on the street selling goods to pedestrians, for an income.