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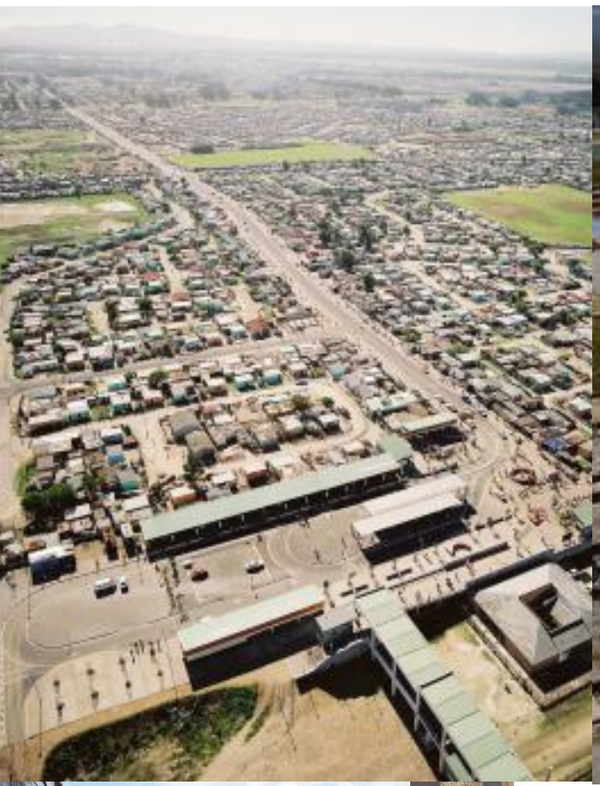
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An incremental approach towards rural-urban migration through the influence of movement.

Creating an integrated neighborhood through Transport Oriented Development principles

Lynette Thabo - 5515760 | ARPL7062 - Urban Design Research Report | 2020

Supervisor: Ludwig Hansen & Mawabo Msingaphantsi













Research report

An incremental approach towards rural-urban migration through the influence of movement. Creating an integrated neighborhood through Transport Oriented Development principles

This document is submitted in partial fulfillment for the degree: Master of Urban Design at the University of the Witwatersrand, Johannesburg, South Africa, in the year 2020.

Student: Lynette Thabo - 5515760 | ARPL7062 - Urban Design Research Report | 2020
Supervisors: Ludwig Hansen & Mawabo Msingaphantsi



SCHOOL OF ARCHITECTURE & PLANNING

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Declaration

I, [Lynette Thabo, 551576] am a student registered for the course Master of Urban Design in the year 2020.

I hereby declare the following:

I am aware that is wrong. I confirm that the work submitted for assessment for the above course is my own unaided work except where I have stated explicitly otherwise. I have followed the required conventions in referencing thoughts, ideas, and visual materials of others.

For this purpose, I have referred to the Graduate School of Engineering and the Built Environment style guide. I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my unaided work or that I have failed to acknowledge the source of the ideas or words in my own work.



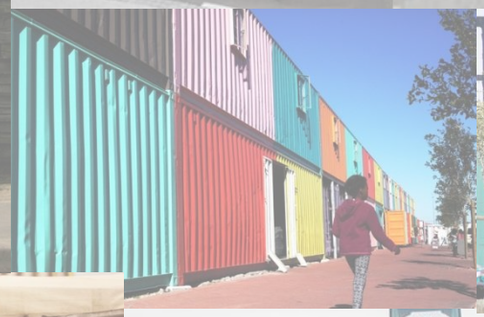
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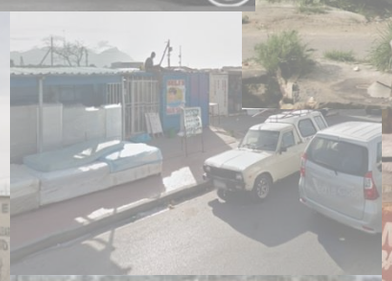




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Abstract

South Africa stands as one of the developing countries that have suffered from its history of spatial planning due to Apartheid. This has, however, greatly influenced social and economic environments of where and how people inhabit space, given a specific context. Post-Apartheid, the Local government has tried to lay down policies and frameworks that would aid in rebuilding local communities and urban environments. These policies and frameworks may contain at least three common goals which involve promoting integrated, inclusive and non-racial societies (RDP,1994, pg. 5) within our growing economy and assuring that democracy is served throughout every development within our environments.

In unfortunate cases, the situation of post-apartheid spatialities, are constantly being aggravated and concretized by the socio-economic challenges that we face as a country. Being that we also a developing country we look at global informants such as rapid urbanization, densification people striving for economic prosperity and moving from rural to urban areas. And by default, we have resulted with growing informal settlements that are constantly drawing the line of segregation resulting in a growing phenomenon of an informal city becoming a norm to our surroundings.

This proposal aims to highlight urban areas that are highly defined by their context and nature (artificial or natural). How people use these places is highly dependent on a network system, that works well for human use, and that successfully contribute towards place-making.

Naturally humans convert these places into community hubs, which then later take form into formalized purposeful functional spaces, this then emphasize the importance of making inclusivity and place-making when working between the urban context, this plays a good role in enabling people to have the opportunity to have an opinion or make solid contribution towards making their environments better places for living. Urban transport planning also becomes one of the many aspects that should be integrated with urban land-use planning to avoid emerging land invasions within pockets of the city that are located near transport facilities.

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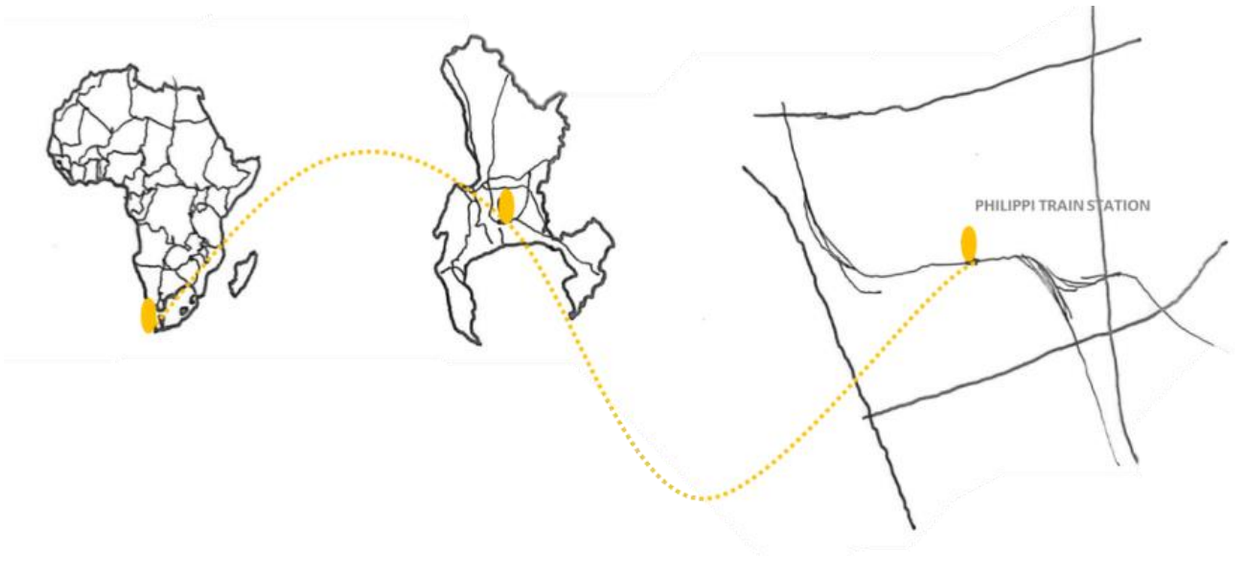
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Motivation

SOUTH AFRICAN HOUSING PRESSURE













Motivation for study

Chapter 1: Introduction

1.1.1 Historical context South African socio-spatial patterns

South African socio-spatial patterns have continuously evolved and been altered by urbanisation across the decades. The Township Transformation Timeline, (2009) (figure 01) that was put together by *The Department of Co-operative Governance and Traditional Affairs (in collaboration with the European Commission)*; this document thoroughly demonstrates an urban development timeline that begins from 1900 to current day realities. The timeline highlights six different development eras.

Timeline adapted from - *The Township Transformation Timeline, (2009)*

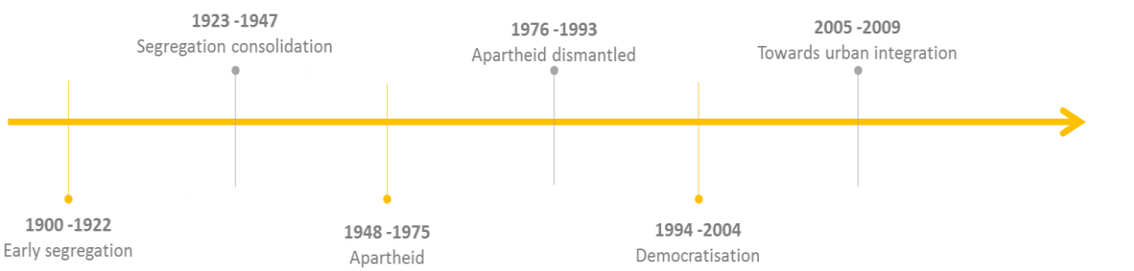


Figure 01: The Township Transformation Timeline, (2009)

The Township Transformation Timeline, (2009) explains the six eras as follows:

EARLY SEGREGATION took place between 1900 and 1922. A central point of integration was developed between towns and township areas next to each other.

SEGREGATION CONSOLIDATED occurred between 1923 and 1947. Spatial segregation was evident between town and townships. Industrial areas were used as a forceful separation barrier. Employment took a form of being a buffer between the two areas.

APARTHEID took place between 1948 and 1975. Separation was legalised during this period. Urbanisation occurred as townships grew. Urban sprawl took place, in the town as populations increased. The forceful separation barriers were strengthened, this resulted in long travel time for people who worked in town, and this was caused by limited infrastructure that was provided to townships by the government.

APARTHEID DISMANTLED between 1976 and 1993. During this period, restrictions of living in town no longer apply, where township residence can choose where they opt to live. However, the greater urban context remains embedded in the spatial structure that is rooted within racial segregation. This further led to urban core's expanded due to urban sprawl.

DEMOCRATISATION this took place between 1994 and 2004. Substantial transformation took place within the Local Authorities. However, with the shift in place challenges arises with initiatives and interventions put into place to help promote urban spatial integration and equity. These initiatives suffered due to poor consideration of urban renewal and urban development strategies and plans that were put in place. This could have been a result of failure to address past living conditions.

TOWARDS URBAN INTEGRATION occurred between 2005 and 2009. Spatial segregation of the Apartheid City still remains a great challenge as interventions continue to fail with addressing the spatial equality and mending the segregation between town and township areas. Instead, more investments were put towards transportation linkages between town and township areas. Furthermore, the impact of private investment and business activities remains as substantial tensions with regards to finding a way forwards in developing townships.

Integrated urban development is a current action that is taking place within the greater urban context. However with new and existing policies and development frameworks should strive to conduct solutions for townships and their greater needs by acknowledging the holes in creating self-sustaining township environments.

This way, each township will allow integration into its greater urban context. In ways of inclusionary growth, recognition of the township's unique circumstances and challenges. And also looking at how the township contributes towards the broader urban economy (The Township Transformation Timeline, 2009).

1.1.2. Progression of transport systems in South Africa

South African socio-spatial patterns are evident throughout the country. However, segregation advanced between cities and its periphery due to Apartheid legislative frameworks (Bickford & Behrens, 2013). Post - Apartheid, Good Transit-Oriented Development (TODs) frameworks were developed in South Africa. These include the application of Transport for Cape Town (TCT), Tshwane's Vision 2055 and the City of Johannesburg Transit Orientated Development Frameworks.

However, inclusionary measure for housing development and other beneficial infrastructure near these transit developments are not fully met when the frameworks are executed during planning phases this is a common occurrence particularly in townships found within the greater urban context.

In addition, urbanization continues to increase the demand for adequate housing and well-structured transport systems to bring about a balance in the growth of the city and its inhabitants. However, this works well when collaboration is present in building a shared vision of TODs amongst the people impacted by this development (Bickford & Behrens, 2013)

The below diagram (figure 02) by Davis clearly indicates a city model that segregated, and yet connects towards the center of the city. The railroad is one of these connectors.

Furthermore, Calthorpe admits that TOD's were evident in the nineteenth centuries. Whereby in this diagram we also see that mass transportation helped shape land developments in this city model (Calthorpe, 1993; Jacobson &Forsyth,2008).

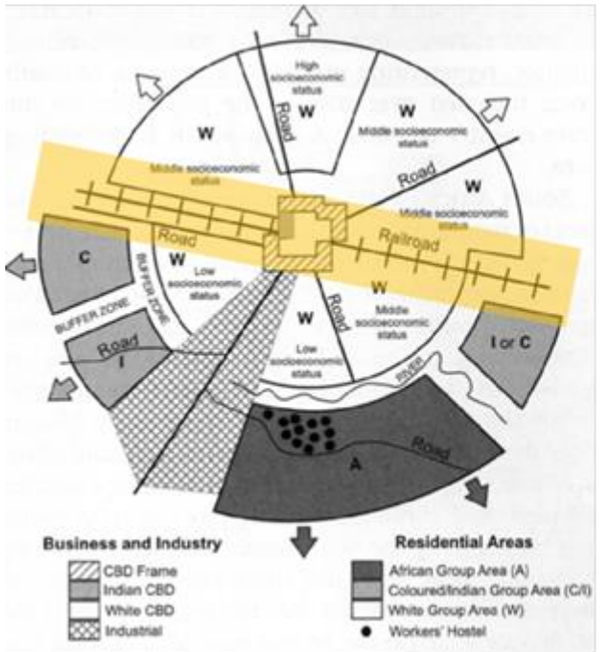


Figure 02: Apartheid City model, indicates central districts (CBD), Industrial and residential areas) – adapted from Davies (1981)

1.3. Problem statement

The study will investigate the pressing issue of neighbouring communities that develop within close range of train stations as seen on figure 05. The study aims to determine the factors that are influenced by urban infill, particularly towards neighboring train stations in low income communities. It is also aimed to look at how people mold underutilised land surrounding train stations into functioning communities.

The suitability of Transit-Oriented Development (TOD) systems will be assessed as a catalyst to help mitigate those pressing issues that train station neighborhoods face.



Figure 03: Philippi old railway depot – base map from Google maps

1.4. Rationale and background of study

Train station and surrounding land can potentially contribute towards creating better - integrated spaces that will contribute towards creating a successful Transit-Oriented Development (TOD) system at a smaller scale within a neighborhood.

1.5 . Introduction to study area

The study area is rich in horticulture and food production which greatly contributes to the greater urban context Philippi is also one of the largest, townships found in Cape Town. It is made up of five areas named: Browns Farm, Philippi East, Philippi West Samora Machel and Weltervreden Valley on the south side of Philippi. The focus area in location within the parameter of Browns Farm, on the south side of the Philippi train station.

The problem identified was how, underutilised land surrounding railway stations contributed towards the growth of informal settlements (figure 06) surrounding the railway station.



Figure 04: Newly developed informal settlement growth surrounding Philippi train station – base map ESRI & Google maps)

1.6. Research question

Main research question

Can Philippi train station incorporate Transit-Oriented Development (TODs) principles with a high focus on the need for social housing and publicness as part of its precinct planning?

Sub-questions

1. Which urban design elements can one use to facilitate the movement that takes place at the train station and land that surrounds them?

2. Can new precincts form in an area surrounding the trains station, where movements, services and accommodation are integrated?

3. Is an incremental and sustainable approach to better integrated communities restricted in areas that surround old railway stations?

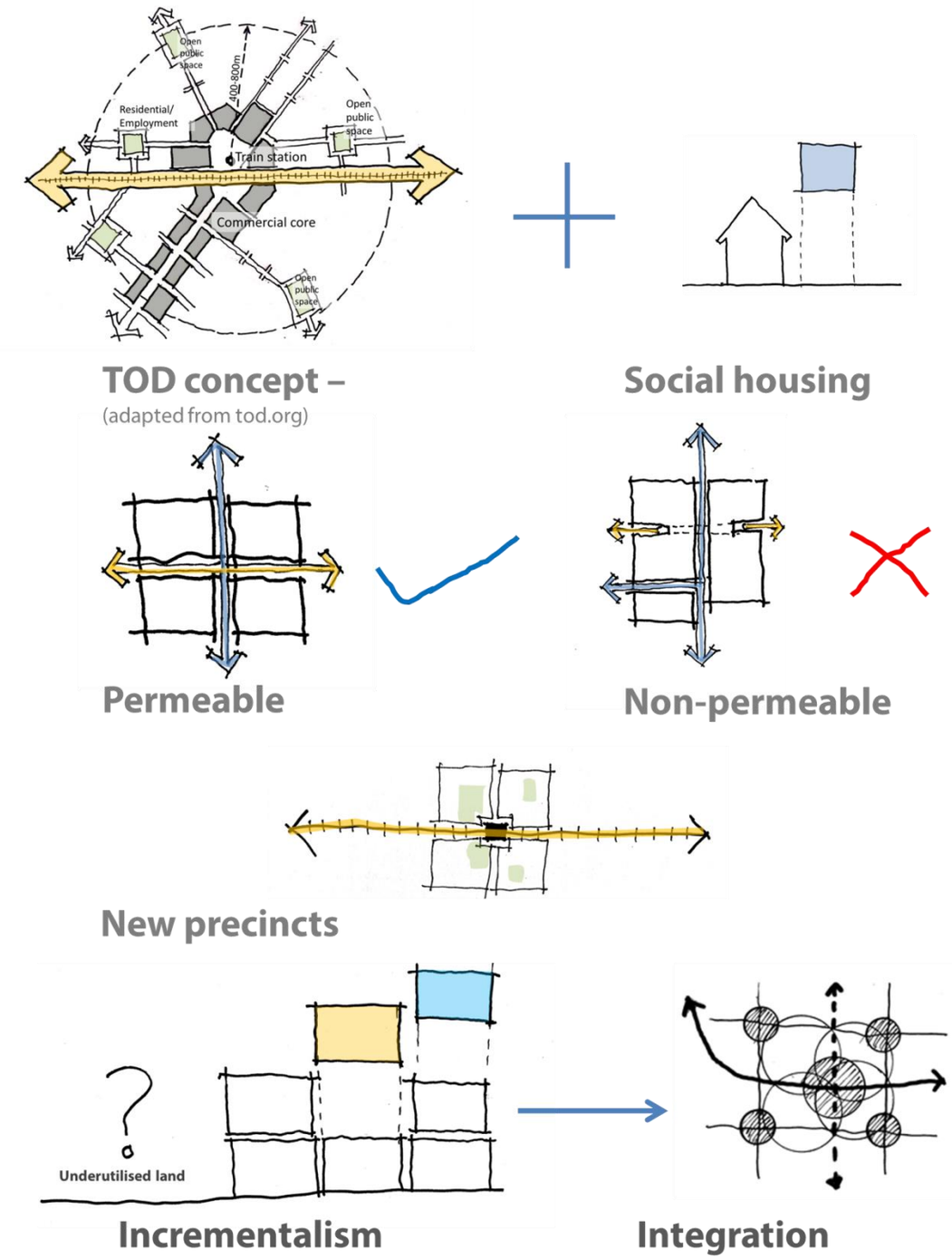


Figure 05: Narrative of research question

1.7. Comparison case-study of two train station

1.7.1. Mowbray and Philippi train stations comparison

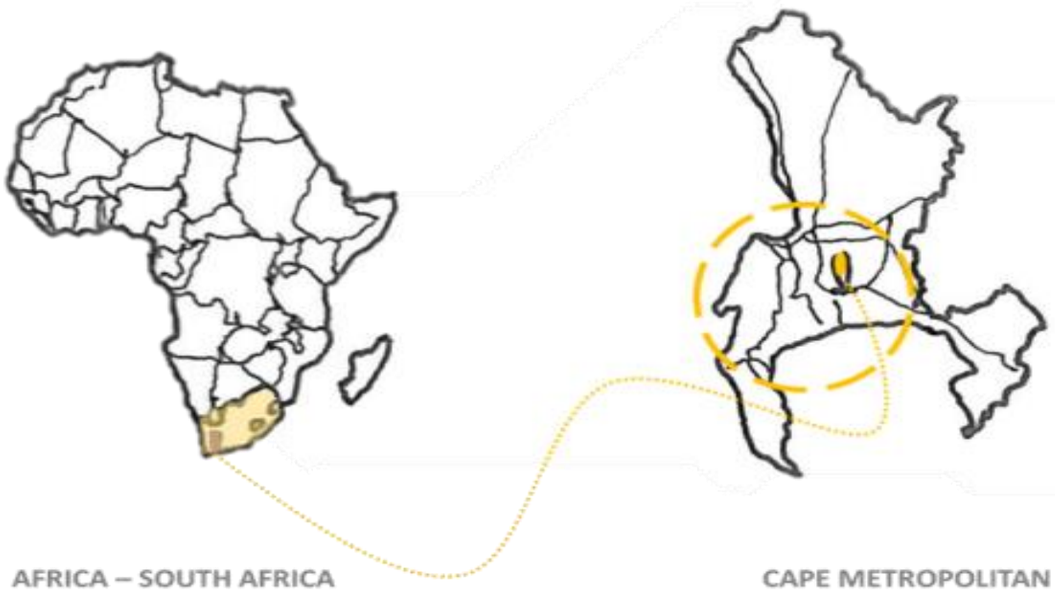


Figure 06: Contextual map of **Cape Town's Metropolitan area** – base map from Google maps

Looking at the greater Cape Town Metropolitan area, two train stations will be investigated to help form of a constructive comparison within their spatial differences. A comparison study between the two railway lines will particularly focus on:

Type A: Stations with a neighborhood within 400metres in walking distance (station stands without a buffer zone between the commuters)

Type B: Stations with more than 400meters walking distance. Are carried throughout different (station stands with a buffer zone between the commuters)

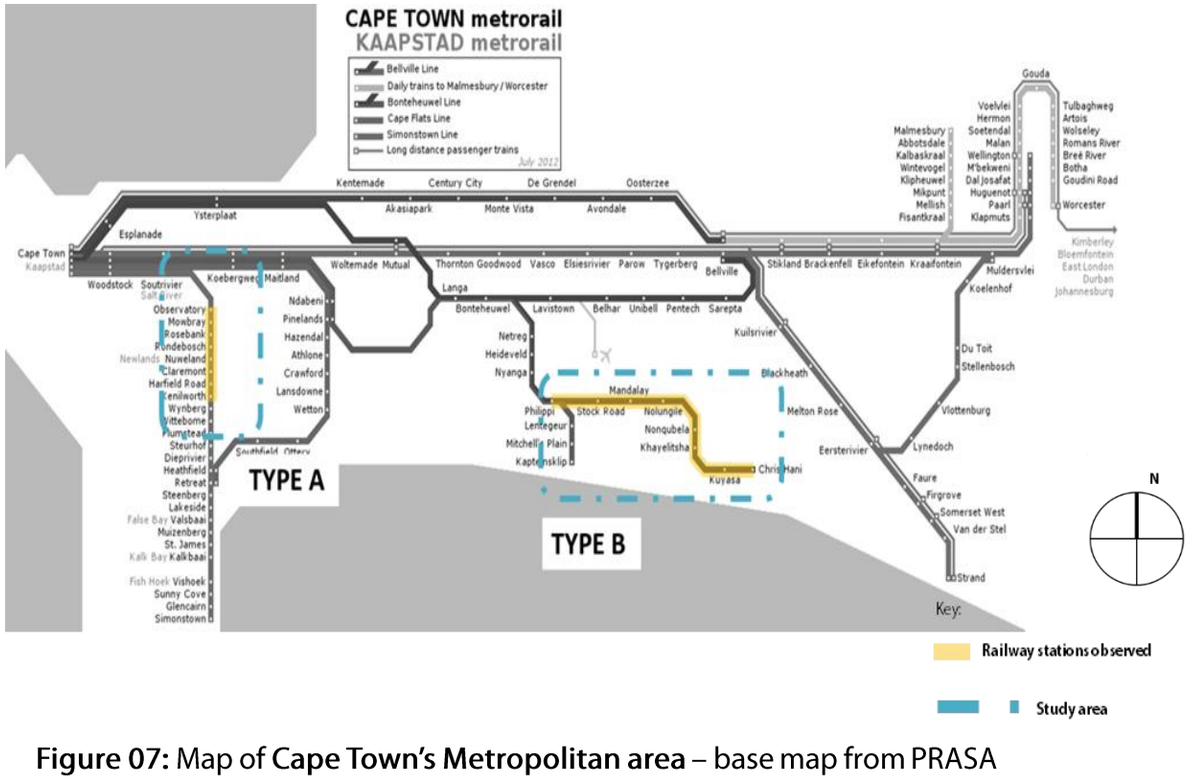


Figure 07: Map of **Cape Town's Metropolitan area** – base map from PRASA

Furthermore the study will investigate evident gaps found within Type B station as stated in problem statement (figure 07). These gaps will help determine opportunities that would allow for design to take place. This included using existing transport infrastructure as an activation node for transport, living, learning, rendering economic services and creating public open spaces within the surrounding neighborhoods and greater community.

1.7.2. Response to underutilised land near train stations (Type B)



Figure 08: Informal settlements on Old Railway depot – IOL News

Figure 08 shows the disadvantages of rural-urban migration. As a result, railway stations are recognized as points of settling for most migrants who are not familiar with the new environment in their moment of arrival to big cities (Tacoli, et al., 2015)

In an urban context, TOD's can be found in both formal and informal settlements which form part of a greater urban fabric. The formal settlements of these urban fabrics are usually well-developed to adhere to the master planning of the greater urban context. Urbanization accelerates the growth of urban poor that is introduced into big cities. As a result, irregular developments are identified within the cities, in response to city-living which often contributes towards the creation of informal settlements (Tacoli, 2014).

Informal settlements are often found dominant in urban areas that are along railway tracks or land that is seen as underutilized close to the railway stations. The development of TOD aims to meet halfway with urban design principles, which addresses issues like mixed land-use, high density, walkability, accessibility, and connected movement networks (Titisari,2016).

In addition to the above, if moving towards designing sustainable cities through TODs and other urban design methods and Principles then, this research will have an empirical impact towards communities with underutilized land surrounding train stations and identifying how TOD Principles can contribute towards designing sustainable integrated spaces.

A great focus on the theory of the subjects within urban design. The aim of this theory is based on using theoretical knowledge to help design a conceptual framework of different scales with a similar typology using urban design principles. This will later result in a practice overview of the theoretical underpinning of both TOD and Urban design principles (Airaab, 2016)

1.8. Research Methodology

Overview of research method

The research is based on a specific site, making this report a case study research. Case study methods' being a quantitative research approach highlights and investigates a phenomenon within a specific given context with the use of carefully selected data sources. A case study also highlights a developmental factor, whereby cases are generated and eventually evolve over time. This occurrence takes place in the form of a series of specific events that might be interrelated as they unveil, the occurrences could take place in a particular time or place (Rebolj, B., 2013).

The research methodology employed in this research report is represented in the form of mapping and diagrams. The literature review is structured around Transit-Oriented Development (TOD) theoretical Principles and other urban design principles that include; place-making, incremental growth, and sustainable environments in the mist of urbanisation.

The research is broken down into eight chapters, where the introduction covers the history of the South African Townships then narrows it down to the history of the study area that is drawn from a comparison study between two locations found in Cape Town, Western Cape, South Africa.

In a case study multiple results are found, whereby "(a) predicts similar results – a literal replication or (b) predicts contrasting results but for predictable reasons - a theoretical replication" (Yin (2003: 47). To determine this prediction, this study analyses done to the chosen study area will greatly pose suggestions for what needs to be considered when designing strategies and guidelines for the area in question. As a result to a feasible conceptual design resolution, a hypothesis will be drawn from a comparison study of two railway lines situated in Cape Town – Type A station in the middle-class suburbs and Type B station in the township.

This will represent a cross analyse of two cases and different contexts. This will then be the departure point for a further analysis and designing stage for the station that shows gaps in its TOD and urban design planning. To illustrate the comparison between Type A and Type B railway station, diagrams will be shown, highlighting the spatial differences in areas where the stations are located.

The data documentation of this study will be recorded by obtaining information from observations and supporting documents found on the study area. Documents will include: Spatial Development Plans (SDPs), Integrated Development Plans (IDPs), newspaper articles, journals and historical records found. Observations will be made on site visits, where photos will be taken and observational drawings will be made for a better contextualization of study area.

Once the data has been documented, it will further be analyzed in prospect to refine the research and find a best fit solution for the problem identified. To help refine this process, Creswell's (2009:187) interrelated stages will be used to analyse the data collected. These six stages of the coding process include:

Step 1: Organizing data that was found in interviews and site visits and preparing it for analysis.

Step 2: Reading through all the data and highlighting a general sense of the information collected and reflecting on its overall meaning.

Step 3: Beginning a detailed analysis with coding process by organizing the material collected.

Step 4: Using the coding process from the organized material to generate themes or different categories for the analyses.

Step 5: Creating a narrative passage to that will outline the findings of the analysis.

Step 6: Making an interpretation or bringing a meaning to the data collected.

All of the steps followed will lead to a defined design resolution which is suitable for the study area in question.

Chapter outline:

Chapter One: Introduction and background to the study: aims to highlight the historical context South African socio-spatial patterns and how over the years South African has seen a progression in its transport systems.

Chapter Two: The literature review to help construct a theoretical underpinning to the body of this research, this will look at, Rural-urban migration writings by Tacoli et al.,(2015), Public open spaces by PPS and Dewar's Design as a catalyst for social change.

Chapter Three: Study area selection and contextual analysis; it is important to draw up a comprehensive case study of two stations in different locations which perform similar functions and identify the problem within the study.

Chapter four: Neighborhood urban toolkit; TOD Principles and movement analysis will be broken down to reach a design resolution.

Chapter five: Conceptual Design Framework includes; Urban Design Framework, precinct development, public spaces and civic node, movement and transit connections, precinct conceptual design and a design intervention.

Chapter six: Key findings; that highlight a point of arrival for rural-urban migrants and could possibly result to rural-urban migrants referring this as a location to settle

Chapter seven: Recommendations and conclusion; to show better ways in which informality surrounding train stations can be better approached with different design methods, to help create incremental and sustainable environments.

The study area also faces real world social problems, (Baimyrzaeva, 2018) whereby underutilised land found in surrounding train stations within low-cost areas results in an opportunity for many informal settlement developments. To further explore the case study, an applied research method will also be undertaken to help evaluate and apply of the urban design principles.

This will be measured by interventions designed to respond to the study area. To evaluate how incremental growth of neighboring areas located within the study area is affected due to urbanization. The intervention will be illustrated by setting out guidelines and solutions for how people move in and out of the community. How they engage with the transit systems in place and how they move from where they live and work.

This method will also highlight how the intervention or framework can further be improved or be evaluated over time due to continuous changes and evolution of similar environments

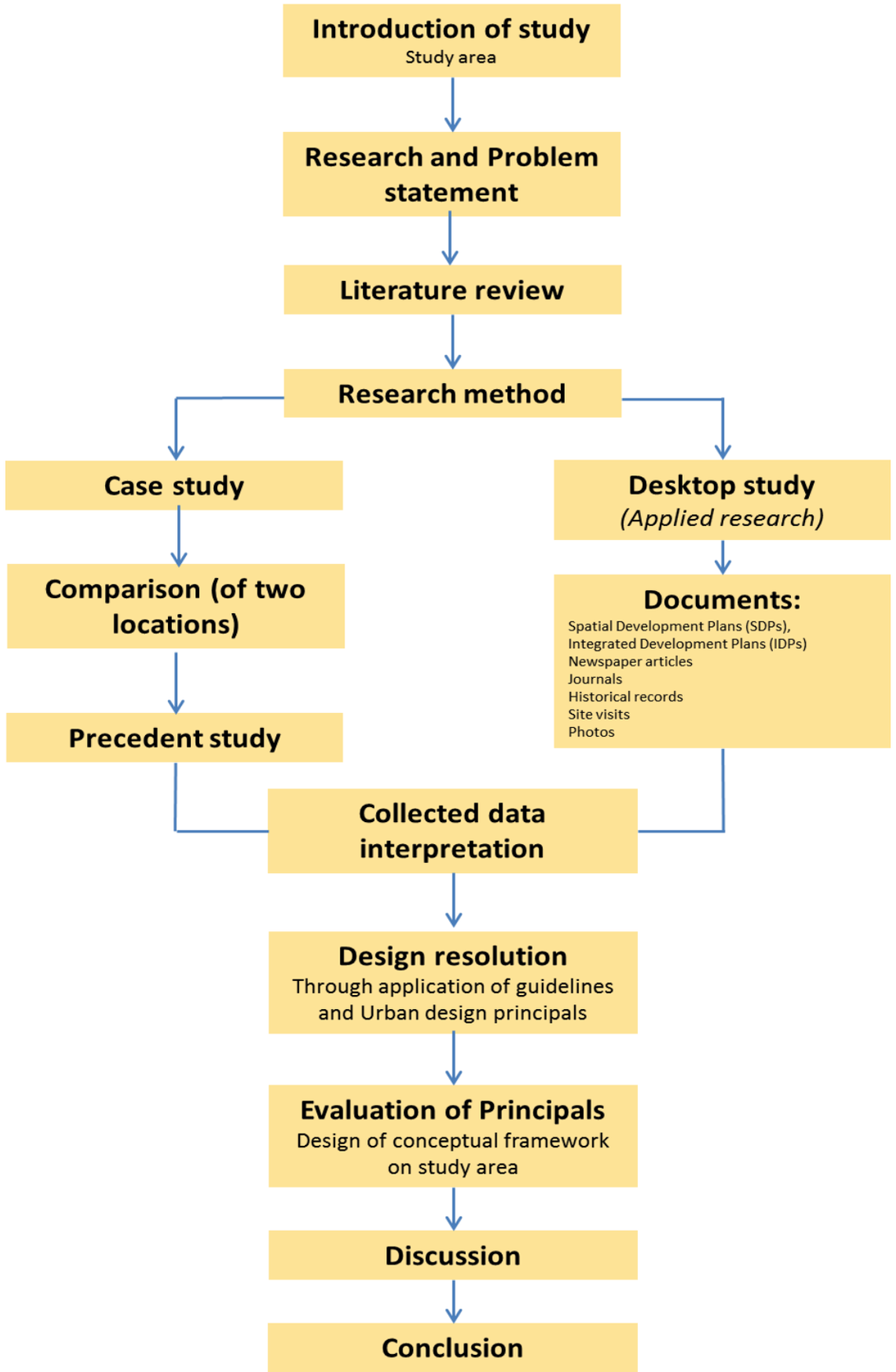


Figure 09: Research framework and study approach

Chapter 2: Literature review

2.1. Rural-urban migration

2. 1. 1. Introduction

Rural-urban migration has become a major contributor to urbanisation. In this case,

> 'Urbanisation which is defined as the increasing share of population living in urban areas (Poston and Bouvier 2010: 307–311)' (Tacoli, et, al. 2015)

However, this has two odds within the urban context, whereby urban poor and housing demands increase. This often leads to vulnerable migrants in the cities. In the South African context, adequate housing, basic infrastructure, and services are the common shortages that are resulted from rural-urban migration (Tacoli et al., 2015). In this case, Cape Town is considered as one of the most fast-growing cities in South African due to natural growth and the number of people who migrate to the city.

In the city, overcrowding and congestion are common. Whereas, the city's periphery informality, inadequate living conditions that one can consider as hazardous environments and crime thrive. As a result, increase the challenges faced by the local government (Bredell, 2012).

In a broader perspective of urbanisation, rural–urban migrants are not a homogenous group, as they are often assumed to be the cause of increasing urban poverty (Tacoli et al., 2015). They are a fraction of overall migrants, whether rich or poor. However, this research will mainly focus on the disadvantaged rural-urban migrants.

2. 1. 2. Circular migration

Often when people migrate from their rural areas to the city, the aim is to go into town, work, save the money that's been earned then return to their homelands to support their greater families. However, this results in a back and forth movement between the rural areas to the city or moving into cities, to later move out of them. Tacoli et al., (2015) refers to this as circular migration. Circular migration has its disadvantages, whereby the individual can delay the process of returning to rural areas as they had planned, however this would require them to find accommodation, which in meaning cases contributes towards the increase of urban poor and lack of access to housing due to financial constrains.

2.1.3. Influences of migration

Rural - urban migration is often assumed to be seasonal. This could be resulted by people moving towards the cities during an offseason of agricultural that occurs in the rural areas – only to return to the rural areas when the demand increase again. However, this is commonly seen with male individuals that strive to earn money to support their families whereby this can be referred to as economic success (Opel, 2005). Other factors that lead to migration include; better livelihood opportunities, education, healthcare, houses and basic infrastructure (Tacoli et al., 2015).

2.1.4. Challenges faced in urban context post migration

In a wider context, poverty in the cities of the global South is rising as more people continue to migrate from their rural areas towards big cities. Particularly for the urban poor, challenges such as finding affordable accommodation in the city. Of which as a failing process they can possibly end up in the peripheral locations of the city (Figure 10). In an insecure informal settlement with minimal infrastructure to withhold living conditions (Khrishna et al. 2014).



Figure 10: Narrative of rural-urban migration – source *refer to reference list/select image* ----------

Marginalization is one of the biggest common negative factors that are closely associated with migration. Wong, et al. (2007) states three different ways of defining the concept of marginalization. These include; First, an involuntary exclusion from participation in one or more spheres of life this could be within a society that an individual finds themselves in. Second, poor housing conditions, that could be caused by the local government's ability to provide adequate houses and basic infrastructure for each individual found within a community (Wong, et al. (2007),

Kuitenbrouwer 1973)). Lastly, Wong, et al. (2007) states that the exclusion of an individual from social life participation can be considered as marginalization within the community.

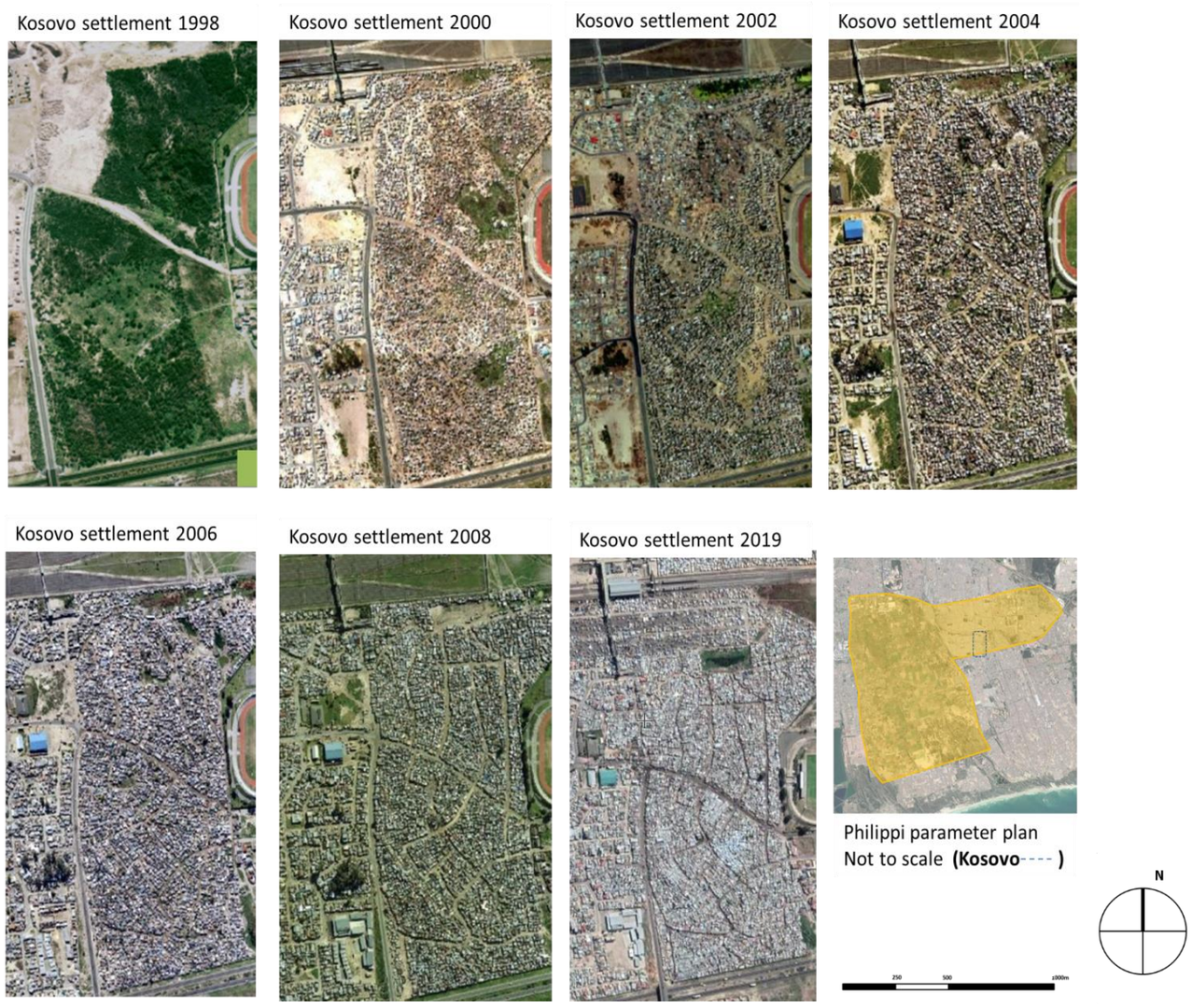


Figure 11: Kosovo informal settlement morphology, base map - *Rural, Land reform Dept.*

However, all the three ways of marginalization, contribute towards, social exclusion with the greater community, poor livelihoods remain a common struggle within the neighborhoods, health risks, due to poor infrastructure and facilities. In cases where housing is an issue, informal settlements temporarily develop in land that unaccounted for, which can later result in evictions or natural disasters depending on the condition of the land (land considered a wetland or positioned on a very steep landscape) (Tacoli et al., 2015).

In addition, the city of Cape Town still falls short with traces of marginalization amongst its societies (i.e. Figure 11: Kosovo informal settlement in Philippi). Social exclusion remains the biggest one. As in some parts of the city, there is still a lack of integrated environments with different income levels which would help with providing a great use for mixed-use of land (Bredell, 2012).

2.1.5. Conclusion

Circular migration will continue to increase with the growth of our global economy (Tacoli et al., 2015). Therefore, the global economy will further increase migration and back and forth movement between the city and rural areas. However, this can falsely contribution to the statistics of urban population growth as some people move to the city, but later return to the rural areas due to the agricultural demand. This factor could possibly assist in methods to help design for this group of people.

As it still counts towards urbanization, this anticipated growth can be filtered with systems that are designed to be inclusive within the society in a sustainable way. In a broader perspective it will increase people's shared benefits, which include the economy and its environment - educational, health, social and cultural opportunities (Bredell, 2012). Failure to filter and future proof these subtle factors will only increase and social exclusion and urban poverty amongst migrants. (Tacoli, et al. 2015)

Due to apartheid, there are still concretized elements that remain as growing challenges in the city of Cape Town. These include: non - integrated settlement patterns, land use fragmentation, poor living conditions in informal settlements, some citizens who are Cape Town's residents experience marginalisation. However, prioritizing the people's needs in the city of Cape Town, means that better plans that address the mentioned challenges, need to be considered. An incremental approach towards reducing the social imbalance and spatial fragmentation would assist in creating a better city that is inclusive of all who live in it (Bredell, 2012).

2.2. Addressing Incrementalism by using Design as a catalyst for social change

Dewar (2002) refers design at the level of settlements and not buildings with the main focus on urban design. Here he highlights three things, namely: The increasing rate of globalization, this includes the redistribution of patterns of inequality and growing poverty. The efficient use of resources remains important. And lastly, the philosophic basis underpinning of spatial development within cities as it is that cities around the world share a number of similarities.

Dewar (2002) further argues that within the urban environments, other emerging environments are commonly recognized as monofunctional, they appear to be sterile, monotonous, and often these environments appear to be an inconvenient place for one to consider living in. However as a reality and the growing nature of urban poor, more people continue to occupy such places.

In the case of Philippi *(and other low income areas),* Dewar (2002) highlight critical facts such as, how of valuable agricultural land and land of high amenity is destroyed due to the infilling of low density within neighborhoods. The density further contributes to huge amounts of vehicular movement being generated on the streets; this not only leaves the streets congested (figure 12) but environmentally it contributes towards air and water pollution and in some neighborhoods it results in a high rate of criminal activities associated with uncontrollable number of events happening all at once.

The density of people also brings about an urge of efficiency and convenience when it comes to accessing public transportation this one sees in (figure 13), where in avoidance of paying rent, and using that money for other house hold things, backyards erected their houses where they found a convenience of affordability, access to low cost mode of transport, and possibly mitigating the treat of crime, when moving from home to work or school.

Dewar (2000) further argues that such environments are impositionary, which often causes an increase in poverty and inequality within the low class communities.

The spatial quality of some of these informal settlements similar to the above (figure 13) is ubiquitously poor. However, as these settlements grow, opportunities for small business are also generated (figure 00). At a later stage these small businesses struggle, largely because of diffuse and diluted thresholds due to the sprawl (Dewar, 2000)



Figure 12: Local taxis in Philippi *(also known as "amaphela" 'Cockroach' taxis)* ----------

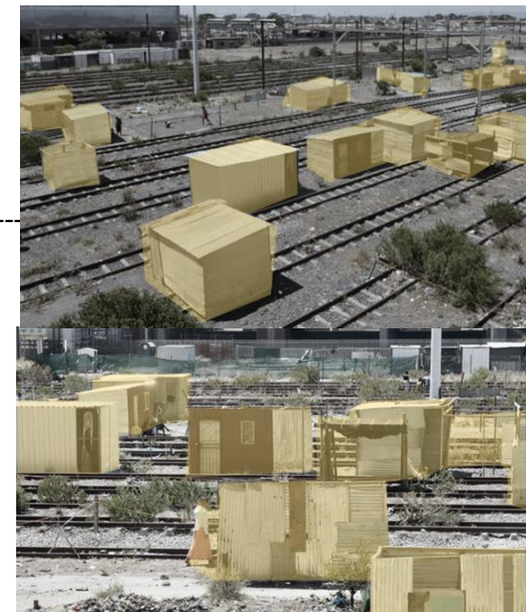


Figure 13: Informal houses erected on old depot line, near the Philippi Train station – *source iol news* ----------



Figure 14: A fruit and vegetable stand of a lay who occupies one of the houses on the railway line– source ground up news

Understanding these informal settlements, is very important, as this help determine the root causes of these growing challenges. Dewar, emphases on the root causes of these problems being structural, whereby, the nature of this structure follows one that is of a modernization paradigm. Dewar (2000) further mentions three primary connections that result to the above problems within the urban context:

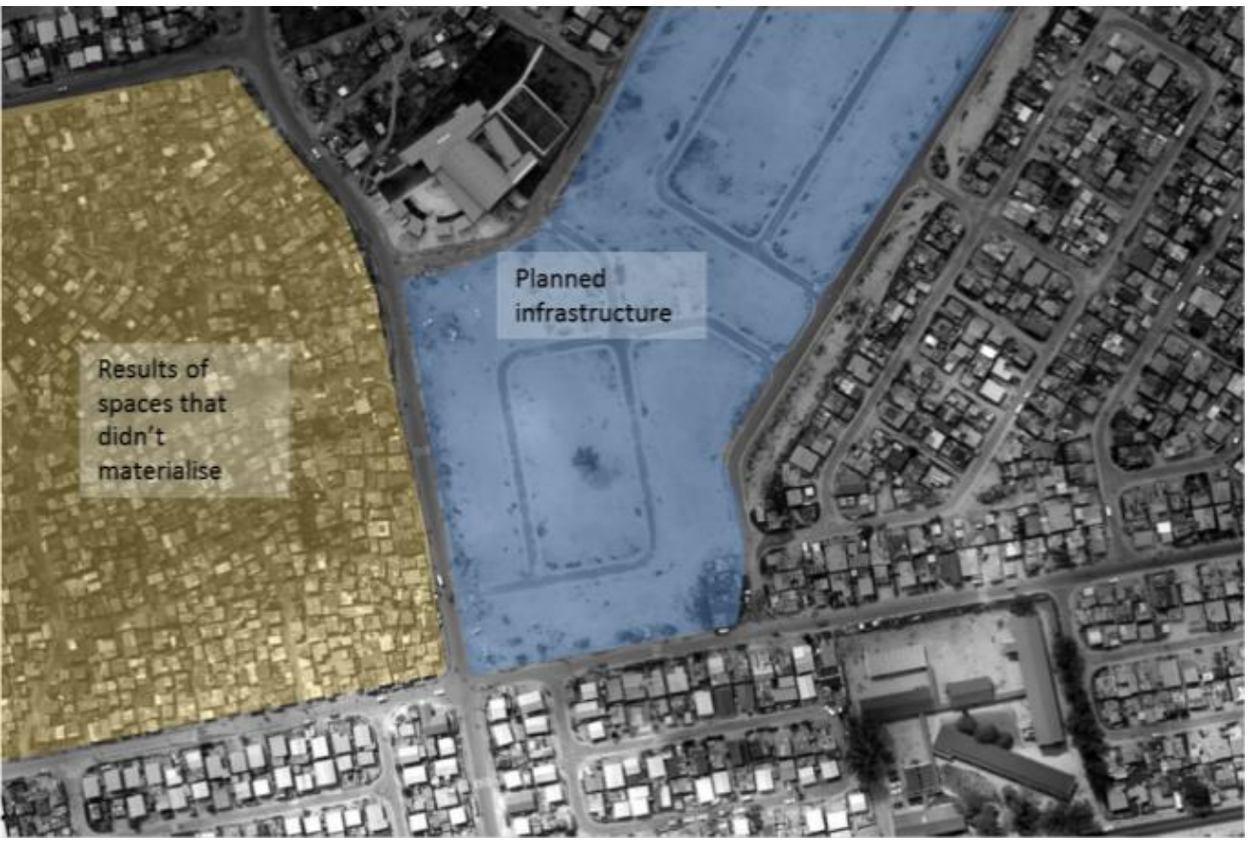
1. The freestanding pavilion surrounded by private space is promoted as the dominant image of the 'good urban life.' This is an anti-urban or suburban ethos underpinning the modernism paradigm.
2. The model is based on separation and mono-functionality leading to sterile environments irrespective of how the environment was designed.
3. The quantitative approach of modernism where settlement making is underpinned by programmatic approaches. This includes: idealized land use patterns are conceptualized, neatly separated, and distributed in space.

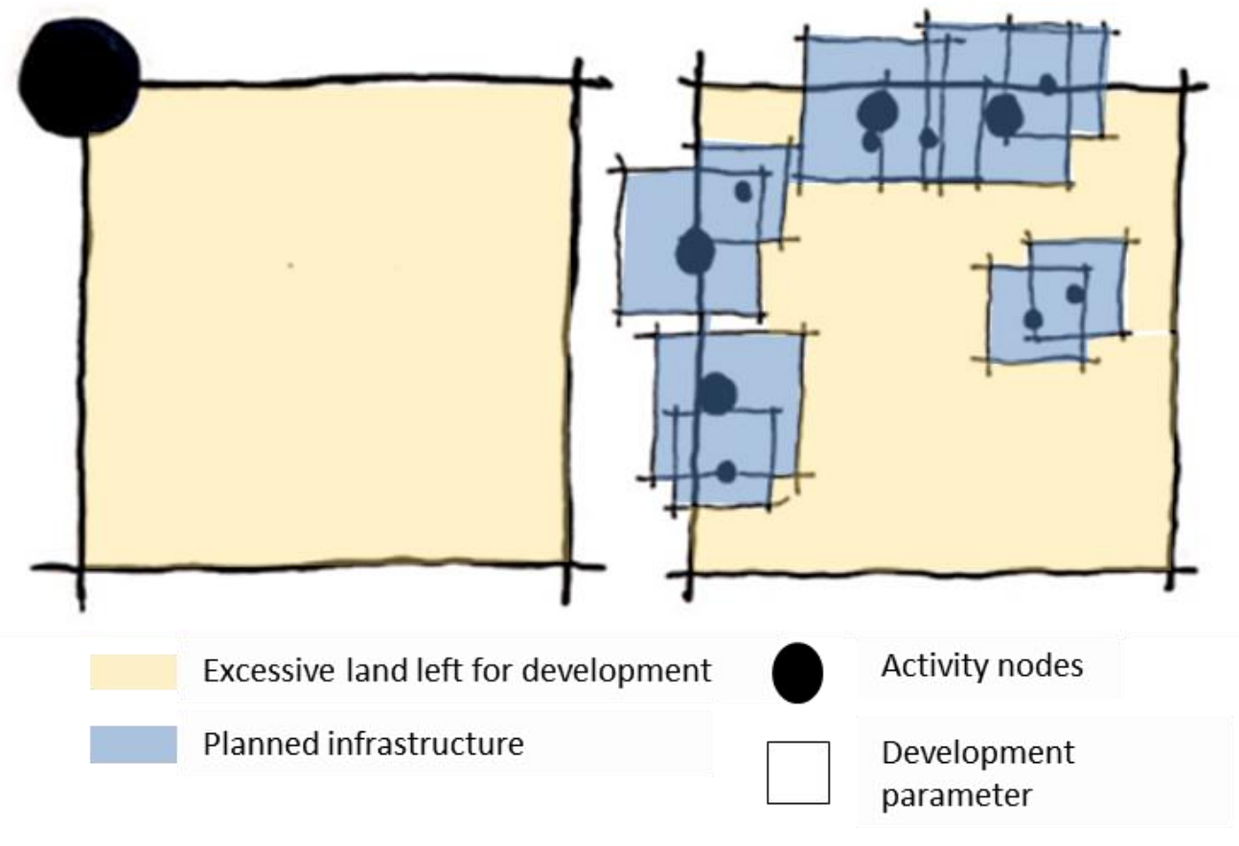
> 'This often means that space demands are 'scientifically' calculated on the basis of thresholds, and a land use schedule is generated (x number of households can support y primary schools, z secondary schools, a clinic, so many meters of commercial space, and so on). Overall this approach is recognized as a rational, comprehensive, highly controlled process leading to balanced end-states settlement making.' (Dewar 2000)

There are two outcomes to these above mentioned approaches, one: the predictions of how open spaces are left out, and expected to be incrementally developed over time, are usually unreliable. Two, how the approach is initiated to how it is applied is the essential plan-making of approaching it from bottom-up.

This includes from big scale infrastructure to small scale individual freestanding housing. However, the second approach has its consequences where, the need to servicing a site arises where water, sewage disposal and road access are looked at,' Islands of privilege' are often created, where smaller proportion of households gains public housing assistance this often involves bureaucratic corruption and political patronage.

And lastly, some areas end up receiving a cut on their social services, where for instance, if a school is built, some parts of the infrastructure provided its of its minimal delivery to its users, where 'libraries are minimally stocked, science laboratories are poorly equipped, sports fields are not maintained, and so on' (Dewar 2000).





----------**Figure 15:** Planned infrastructure vs. underutilized land– *city of Cape Town*

Figure 15, indicates a constants result of environments that suffer from receiving partial service delivery. This is highly recognizable when some service deliveries become inequitable and inaccessible so some individuals within the greater community. Where, often one would see

excessive land being left future developments that do not materialize leaving parts of the greater urban fabric fragment with pockets of areas often seen as dangerous and unpleasant to inhabit.

As a way forward, to come up with an approach of creating an environment that is well held together.

Dewar (2002) suggests creating a new tradition, (figure 18) which involve, avoiding suburban planning developments, and embracing the urban development.

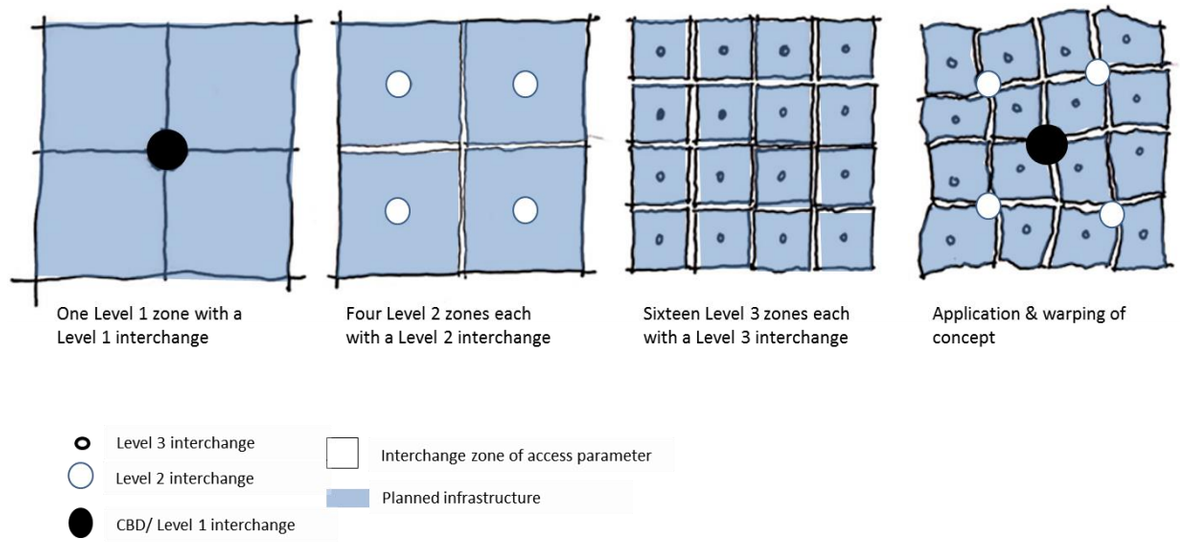


Figure 16: New approach to planning urban development – *city of Cape Town*

Where in figure 16, compact living is initiated, mixed use of land and function is incorporated and an equal distribution of services delivered to a greater context, in opposed to an individual to help guarantee sustainable environments.

---------- **Figure 17:** Investment routes diagram of the city of Cape Town

2.3. **Movement:** Public & Economic connections between transit, people and open spaces

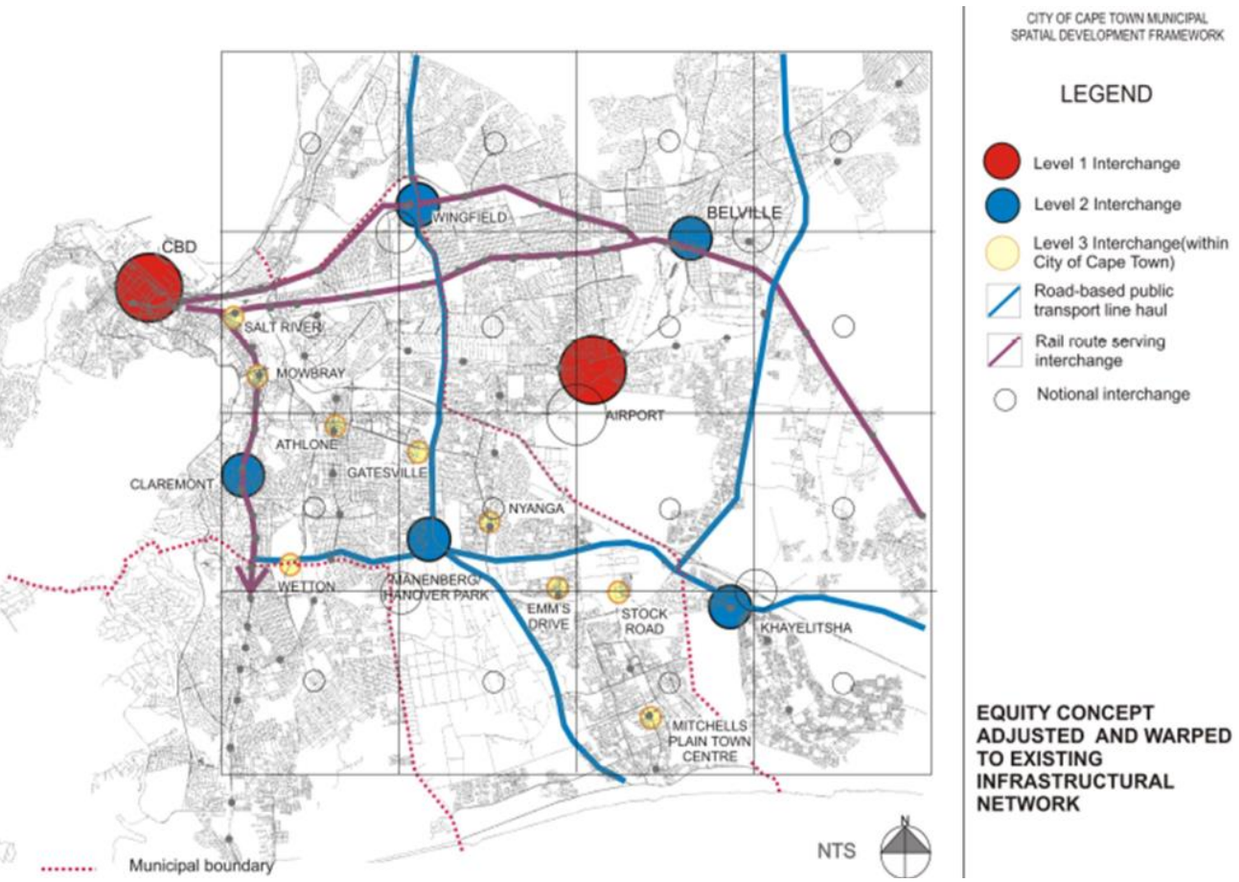


Figure 18: Equity concept by Dewar – *city of Cape Town*

2.3.1 Public transit

Urbanisation globally often starts with movement, and like many other developing countries, South Africa's growth population is on the rise. The influx towards urban area in access of school, work or other recreational activities is constantly putting pressure on transit systems and with minority travelling in private vehicles, majority are still highly dependent on public transport (Teffo, et al. 2019).

As a result of South African townships being developed in specific conditions and structured in a particular way, whereby buffer zones were laid out between different ethnic groups and industrial areas. Travel to the city or town was only by rail rather than road. There was only one road connected the township to town which was often the only road that ran through the industrial area (The Township Transformation Timeline, 2009).

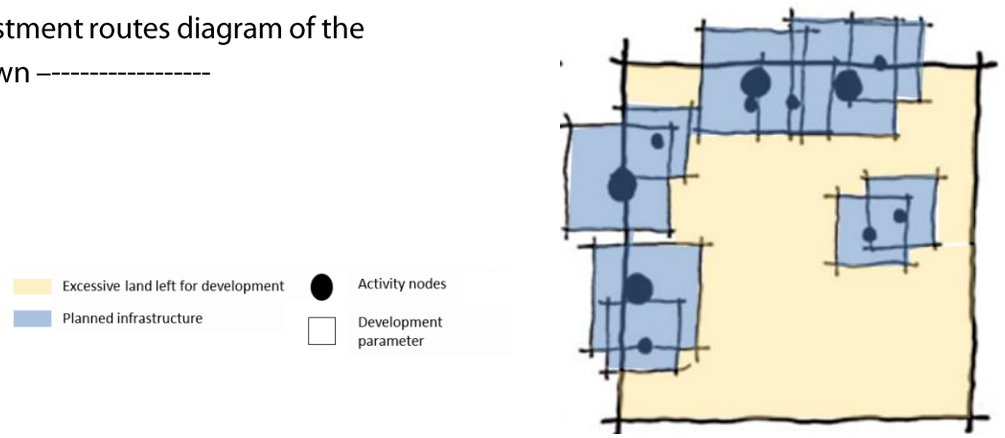
Today as a result to the apartheid transit system townships and some informal settlements are left with limited options as public transport is the dominant mode of choice. According to Statistics SA (2013), minibus taxis occur to be the first choice of mode, then buses and last the train.

> '… there has been a very poor post-apartheid government response to the escalating mobility needs of low-income travelers, who constitute the vast majority of South Africa's urban population' (Lucas 2011 pg 1320).

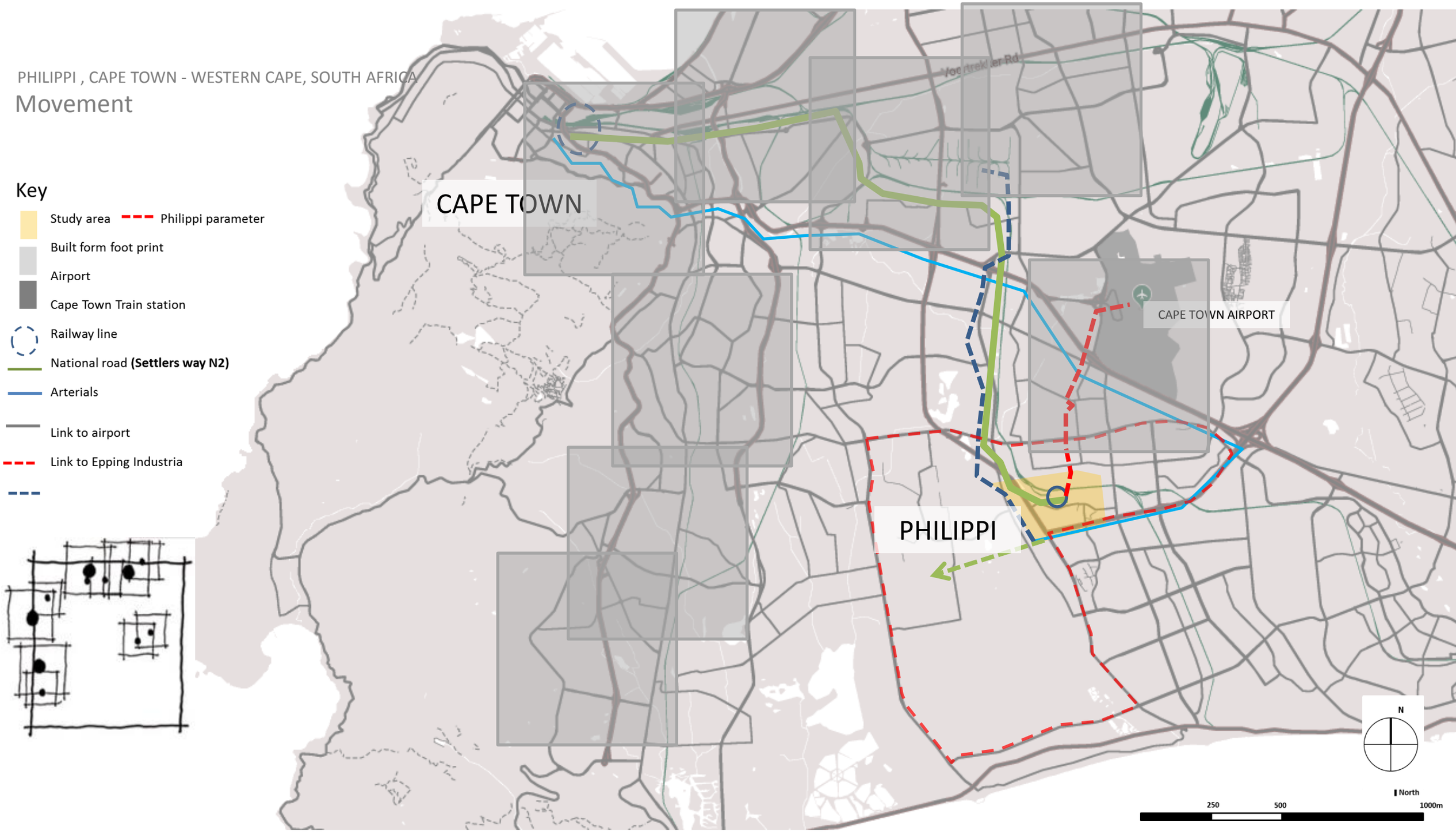
People in the city's periphery are continuously seeking convenient spaces which offer a direct link to transport systems, with some fragmented settlements leave no option for public transport making it even more difficult to access formalized transport systems. Lucas (2011) further adds that this seeking of convenience is illuminated by the extreme transport poverty within the South African context. Lucas summaries factors that contribute towards transport poverty into four reasons that include: (1) a low access to private and public transport services, (2) affordability remaining an issues which is closely linked to minibus taxis being the first choice of mode, (3) the dominate legacy of apartheid planning and the increase of sprawling suburban developments, (4) over-reliance on walking poses a threat to the individuals' safety (Lucas, 2011).

In Cape Town's context to help mend some of above mentioned spatial inequalities, Southworth (2003) writes about implementing new public spaces to help integrate and regenerate the city's urban context. The implemented approach came through the City of Cape Town's Dignified Places Programme, which was based on five spatial Principles these included: equity, place-making integration, minimalism and how the product is to be generated. The diagram below (figure 19) indicates where most of the investments (blue) took place within the city of Cape Town, here the indicated activity nodes are well connected with public transport, work opportunities and other social facilities interlinked. The yellow on the other hand is the Cape Flats where the nature of living is predominately poor and the environments as not well conducive for a healthy livelihood.

Figure 19: Investment routes diagram of the city of Cape Town ----------



2.3.1. Public transit



Key representation of investment routes in the City of Cape Town.

Figure 20: Movement analysis between Philippi & Cape Town with : Investment routes diagram overlay - base map Google maps.

Public transit

Today the city of Cape Town has a good record of efficient public transport. The city's public transport provides a network of services that include: Rail passenger services by Metrorail, Golden arrow bus services, My Citi bus rapid system (BRT), minibus taxi services, regulated metered taxi services and long distance services for both road and rail.

However with the city's good record of public transport, the townships are still challenged by Lucas' four factors of very poor post-apartheid government response towards providing adequate transport facilities.



Figure 21: Local taxis in Philippi *(also known as "amaphela" 'Cockroach' taxis)*

Many townships have developed their own convenient methods of commute locally (figure 21) and Philippi is one of them. As a result, many cases have been raised of criminal actives and rape case associated with these small business taxi associations (Dano, 2014). However this comes with its challenges of facilitation and management within the neighborhood. In addition this comes with other good opportunities of integrating a plan that works for both the members of the greater neighborhood, and the small taxi owners. A plan that could subtly facilitate movement, people and other businesses that fit in-between can help create better safer, sustainable environments.

Figure 22: Cape Town public transport



2.3.2. Transit Oriented Development
as an intervention towards underdeveloped train stations

As a result of addressing most of the literature reviewed in this research, Transit Oriented Developments and its principles informs a better approach towards the theories that are reviewed. These principles summarise what could possibly better execute a contingency plan and help confront a plethora of spatial development challenges that faced by places such as townships.

Like many other cities world-wide Transit Oriented Developments are being widely implemented to help address spatial challenges faced by communities. This aims to create better integrated spaces that the people can use and easily create a sense of place (Ndebele and Ogra, 2014).

In the case of Cape Town, the city centre has a very well integrated TOD system, the ticks all the boxes if not all according to the City of Cape Town's Transport & Urban Development Authority TDA-Cape Town (2017). The Transport & Urban Development Authority aims at integrating mass public transportation with city making for greater mobility and connectivity. Their main TOD principles highlight accessibility, affordability, efficiency, intensification and densification. These principles are backed by two drivers that include creating sustainable public transport systems and designing towards a strategic Land Use interventions (figure 23) (TDA-Cape Town, 2017).

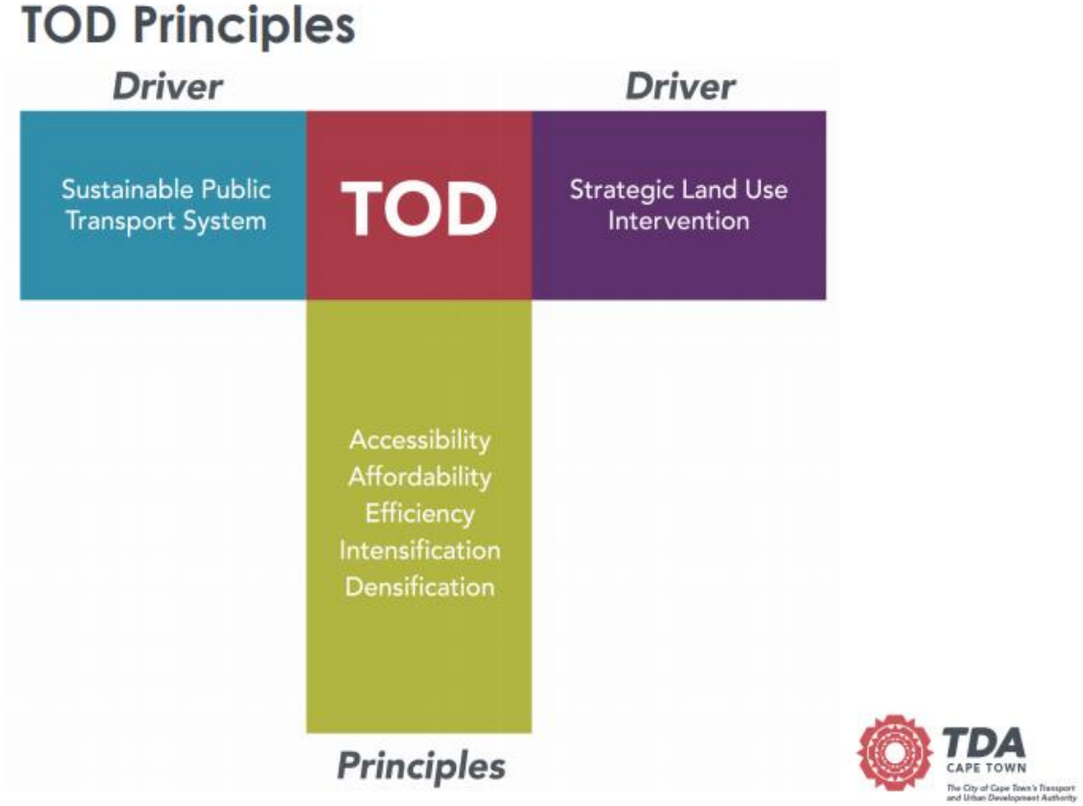


Figure 23: TDA City of Cape Town TOD diagram

In place of the diagram above, the City also has a vision 2032 of the Integrated Public Transport Network (IPTN) plan. This plan will apply TOD principles and is aimed at addressing:

'…spatial inequality, improve public transport affordability, and arrest sprawl, which is driven by the integration of sustainable public transport and strategic land use intervention and built on the principles of affordability, accessibility, efficiency, intensification and densification'-TDA-Cape Town (2017).

Like many other concepts, most them, are first implemented in the city centre and then after in the communities neighbouring the city. It is not often that the City's townships have such pilot interventions and this often results in the upgrade of township intervention being delayed or being written off completely due to lack of funds in many cases.

Conclusion

In the case of a township like Philippi, that neighbours the city and stands a great potential of becoming the most connected township in the city of Cape Town. Developments of the TDA-Cape Town and (IPTN) plan can advocate for an integrated city by creating a central node at Philippi train station. Whilst utilising the old Philippi depot that is currently growing in numbers of informal housing to help create a more compact and higher density node that is surrounded by public open spaces that people can use as points relief.

Together with this central node intervention, strategic nodes can be allocated in areas neighbouring the train station. This can help create a better connected public transit system and encourage a well maintained ridership. Together with prioritising non-motorized transport options over vehicular use, this can be recognised as the building blocks of TOD within Philippi township (Ndebele and Ogra, 2014).

Not only would this help minimise the occurrences of informality in areas surround transit but it would assist in facilitating movement such as rural-urban migration and the accessibility of everyday commute.

The indicated diagram (figure24), summarises a greater scheme of what can be implemented on not just Philippi train station, but other train stations found in the townships with a similar context to the study area.

This diagram centralise TOD as the core driver, with people being the starting point of intervention backed by other supporting TOD elements such as:

- Connectivity
- Affordability
- Transit
- Compactness
- Densification/Intensification
- Mixed land use

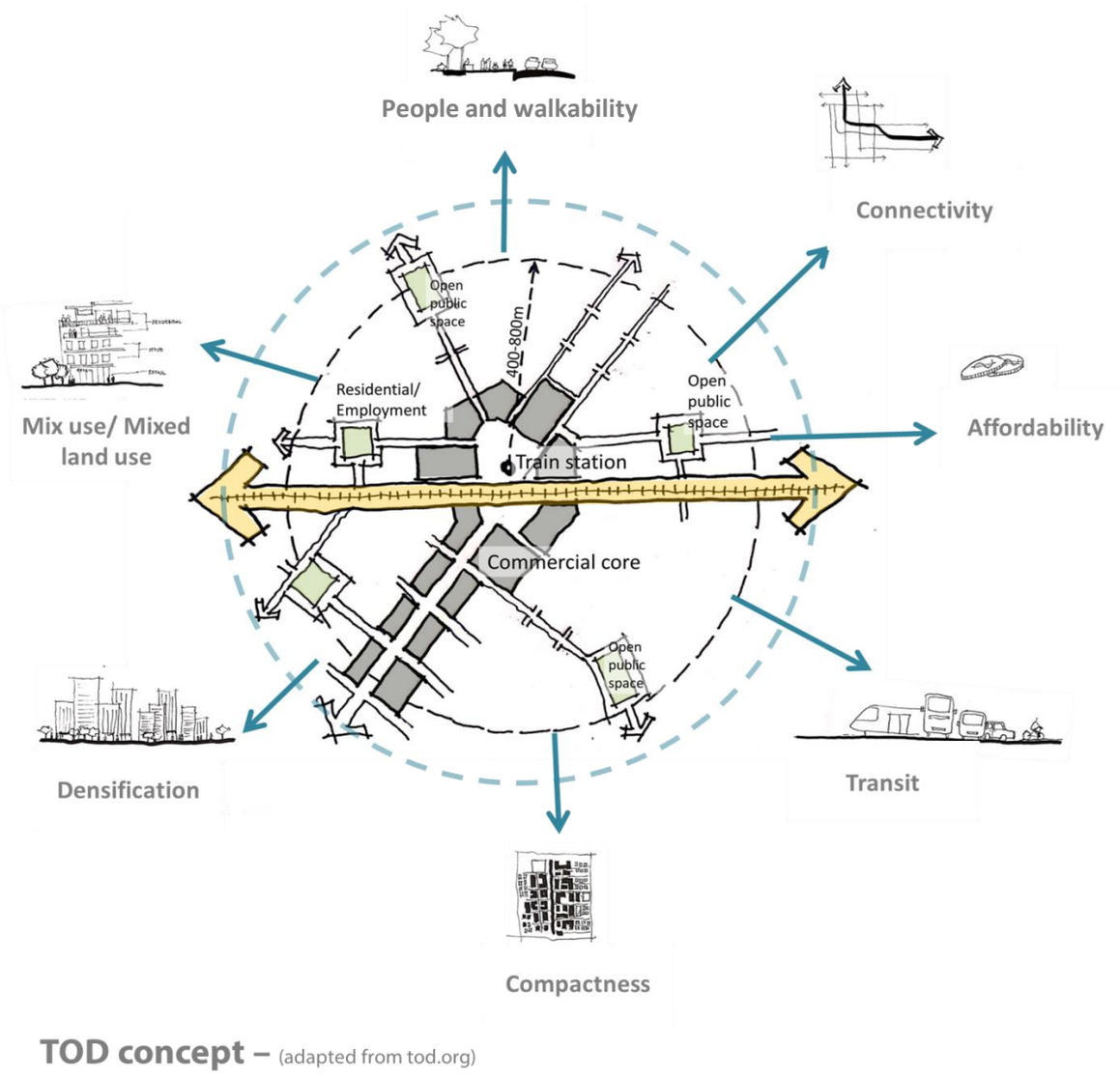


Figure 24: TOD diagram

2.3.3. Formalised informality within the township

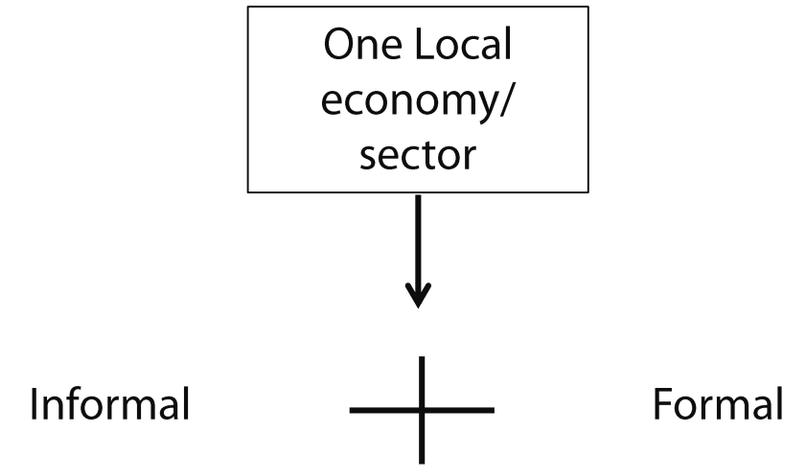


Figure 25: One sector diagram

The formal and informal economy can both create one local economy (figure 25), and this can be followed by the addition to the list of the Sustainable Development Goals (SDGs); "goals number 11, the Urban Goal, titled 'Sustainable Cities and Communities: make cities inclusive, safe, resilient and sustainable" – Watson (2016). In support of the SDGs goals, Watson discusses, that planning at national, regional and local levels was set up to implement this goal alongside the establishment of the Revised Zero Draft as part of the new urban goal.

Majority of the Revised Zero Draft emphases on 'inclusion', however, across the board planners have found this term ambiguous as it causes conflict between urban economic growth and redistribution within the urban realm (Watson, 2016).

This is also evidently the case when looking at a context such as a township, which predominately thrives on the informal sector and this is formulated mainly by the informal micro-enterprise economy. In a township such as Browns Farm consists of 80% informal and 20% formal housing; within the 80%, most of the people mainly reside in informal settlements, that is considered as a make-shift dwelling (shacks)setting (SLF,2018).

Like many other townships which face socio-economic hardships, As seen on figure 26, informal trading is expressed on main spine Ingulube road (north of train station) has a combination on informal and formal trading. Browns Farm and surrounding communities have shown the potential of establishing their own micro-enterprise businesses as a form of entrepreneurial opportunities that best suite their context and serve their immediate needs within the community.

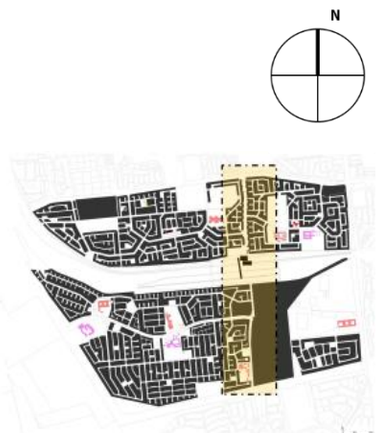
Informal trade expressed on main spine

- Ingulube road *(north of train station)* has a combination on informal and formal trading.



Figure 26: Narrative of informal trading – *source on image*

1. Convenience shops/ salons/ barber shop
2. Corrugated sheeting house for sale
3. Meat market (adjacent to train station)
4. Convenience shops/ salons/ barber shop and local taxis *(amaphela)*



In addition to the formalisation of informality, the SLF(2018) questions the amount of vibrancies that the Township has of the informal economy. The response was that, the uniqueness in the spatial design of each township affected its informal economy and how it expanded in the future. In addition, transport links are also an important spatial influence that contribute towards this expansion.

However, in the case of the selected study area, TOD principles can be used as a driving force that would enable some extent of formalisation to what is already existing within the area's informal setting. Connections and roadways can be better integrated to help create a strong transport link as SLF(2018) highlights:

> '…where the transport system results in increased pedestrian traffic and commuter flow, micro-enterprises emerge as a response to increased consumers passing by. The street infrastructure is also crucial for the incubation of informal businesses.'

In summary; a thriving micro-enterprise is one that sits alongside a street that has a large amount of foot traffic, with this said a typical streetscape is characterised by a dynamic marketplace, that includes; 'street trade, repairing of appliances, restaurants, car wash, hair care and green grocer' – (figure 27) SLF(2018). These micro-enterprises are in response towards individuals who make their way to and from work using their chosen mode of transport.

On the other hand grocery shops (spazas) and shebeens characterize the inner residential streetscape. Often, this expands with the demands of the locals, and often one finds that new enterprises develop within close proximity to residences, making life easier for the residents when it comes to time travelled to shops (SLF,2018).



Figure 27: Micro-enterprises along high street towards train station - *Source on image*

2.3.4. People in public open spaces as a form of sustainable environments

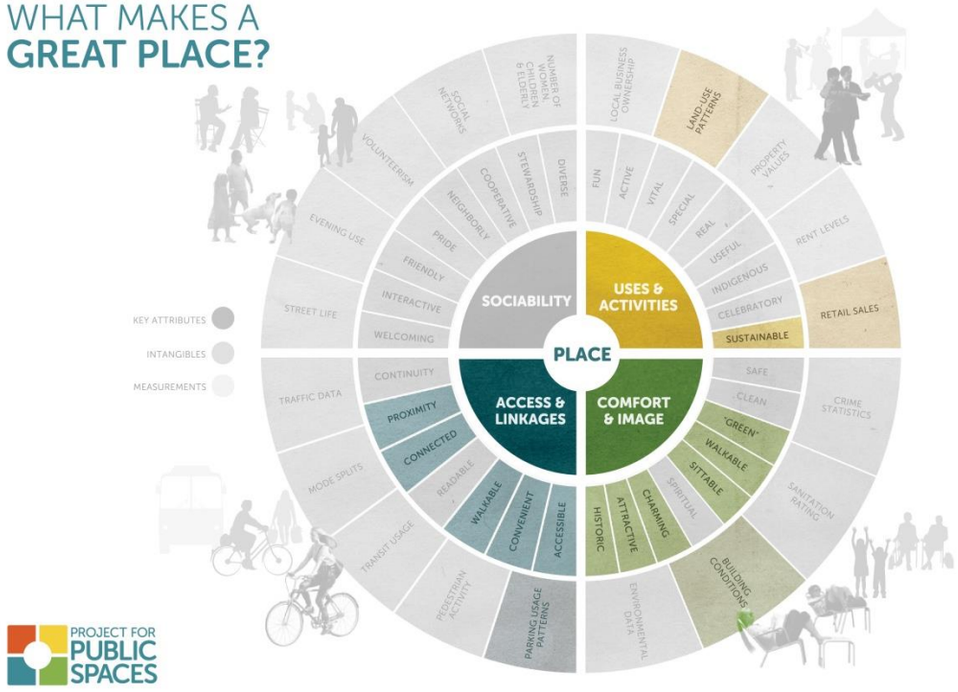


Figure 28: The place diagram - PPS.

PPS has found that, public spaces share four qualities which include: Uses and Activities, Comfort and Image and Access and link ages and lastly Sociability. Figure 28, illustrates the place diagram which consists of three layers, first are the four qualities of a public spaces. Second are the main attributes of a space, and third are the measured qualitative and intangible aspects of the space.

Stanley, et al. (2012) adds that urban open spaces can be analyzed in many different categories which include: parks and recreational gardens, recreational space, urban plazas, streets, transport facilities, food production areas, and incidental space. These different types of open spaces help inform and contextualize the function that either serve, socioeconomic, political uses or urban ecological purposes. Stanley, et al. (2012), further highlights a conceptual typology construct, that tension between form and function; this approach helps define and explore urban experience complexities found within open spaces.

However, when taking it back to history and looking at different models of cities with green belt of buffer zones, South Africa the apartheid spatial city model (figure 29), is similar to Chandigarh, India, paradigm of Modern architecture and urbanism by Le Corbusier. Where the capital of Punjab state was built upon vacant agricultural land, with this came the establishment of greenbelts, which were dedicated to creating recreation spaces and in some parts they were used as buffers between residential and industrial zones.

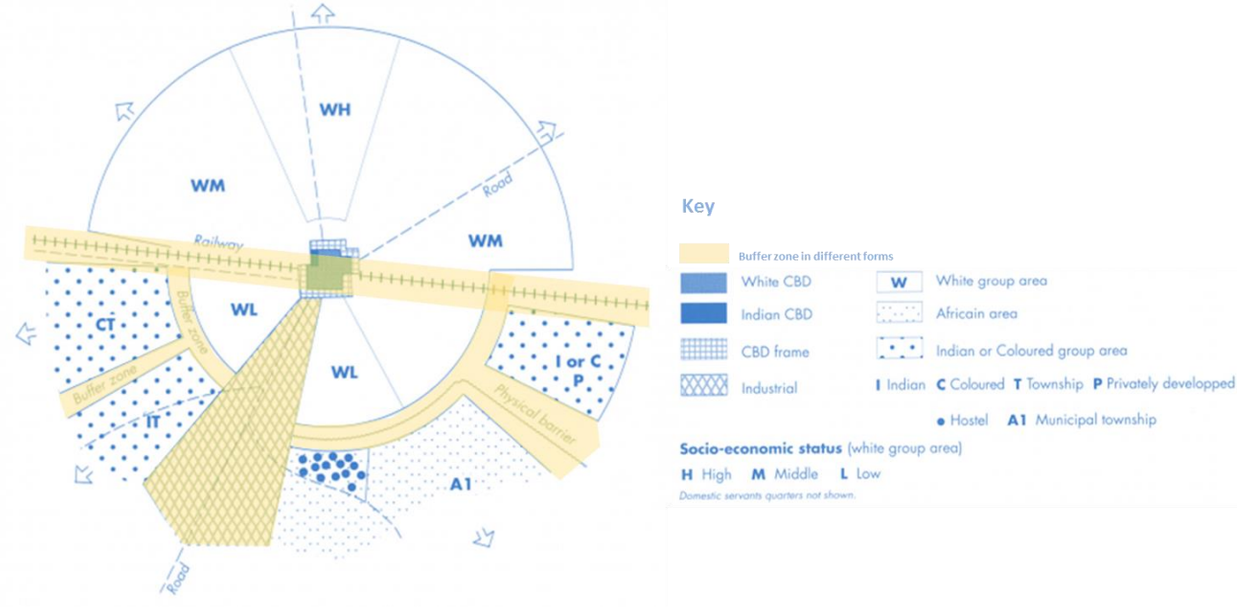


Figure 29: The model of the apartheid city - adapted from Davies (1981)

However unlike the South African apartheid city model, Chandigarh has better linkages, with a hierarchy of spatial function integrated within the grid. It also has an equal distribution of green structures and the railway of the city sits it periphery (Bharne, 2011).

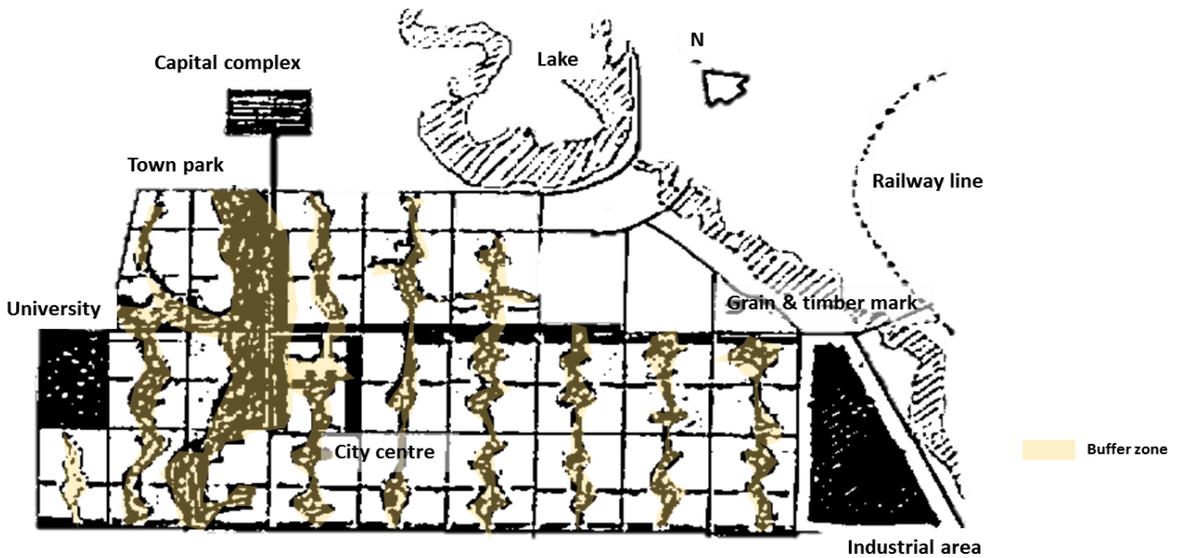


Figure 30: Chandigarh, India - Le Corbusier

This has reduced the amount of public spaces or the proximity in which one would be able to access a public open space found within a township. To emphasis on this disadvantage, Koohsari and kaczynski, (2008) adds that the quality of life found in an environment is often resulted by accessible public open spaces. The proximity of these public open spaces encourages physical and mental health; these spaces also improve the air quality of the neighborhood, serve social and political functions within the greater community.

Conclusion

Reflecting on formalising the informal within the Township, the main aspect is people. And through scholarly theoretical reviews, people have been proven to contributes towards creating a unique distinct character and a sense of identity of a place that they occupy. Some of these places are memorable because of the landscaping around the building, the style in which the building was built and patterns of local everyday life.

However, with this said better methods can be used to design more sustainable public open spaces. This can be achieved, if careful attention is placed on how the sprawling suburb is planned. Growing numbers of gated communities are expanding in the urban fabric, with poor consideration on how people without cars navigated around these neighborhoods this often leads pedestrian to walking longer distances then expect. The amount of dead end streets also contributes to poor use of provided public open spaces as this is hindered by a leak of direct linkage from people's homes to these spaces.

Like Chandigarh, the purpose of its initial function has completely shifted, from what it was initially designed for, and its use will continue to shift as time passes through different generation. What makes Chandigarh's green structure great is its ability to evolve over time, and how it also serves different purposes over time (Bharne, 2011).

Chapter 3: Study area selection

3.1. Case study

3. 1.1 Case study and comparison

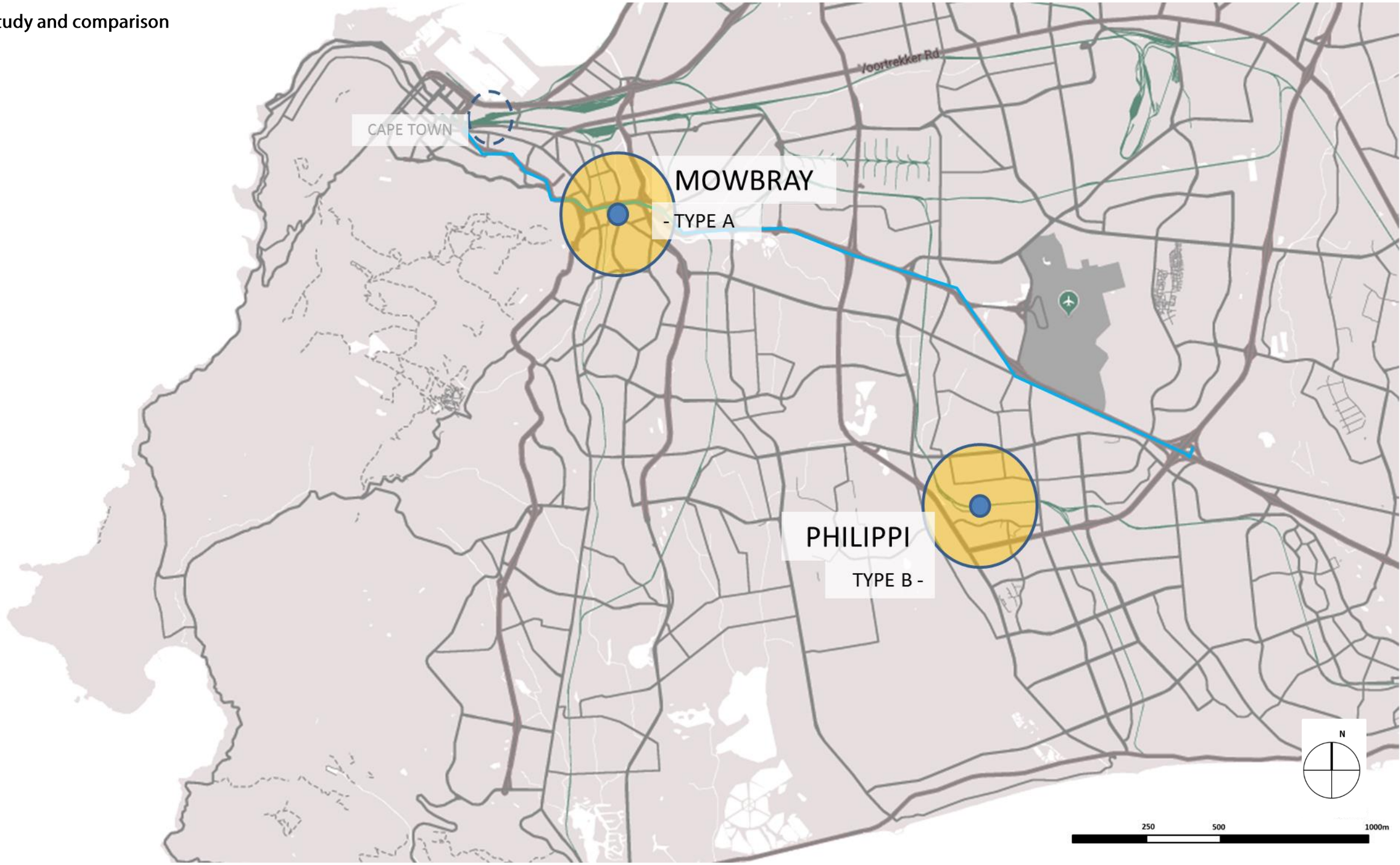
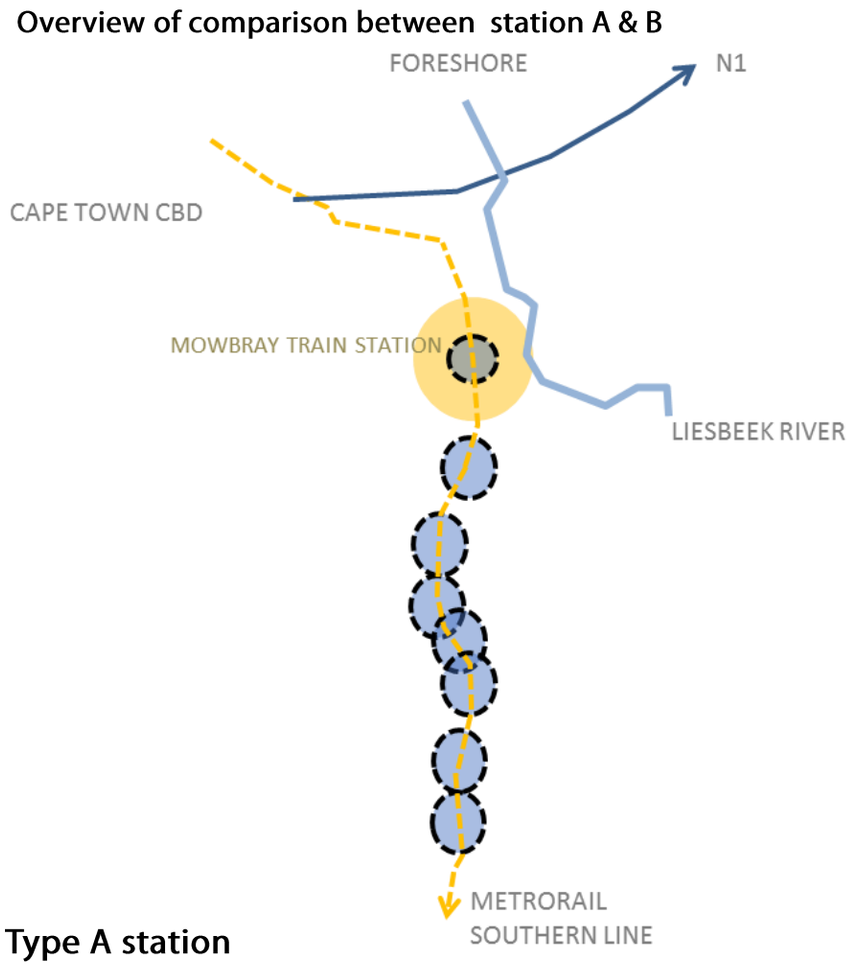


Figure 31: Contextual map of **Cape Town's Metropolitan area** with train stations – base map from Google maps



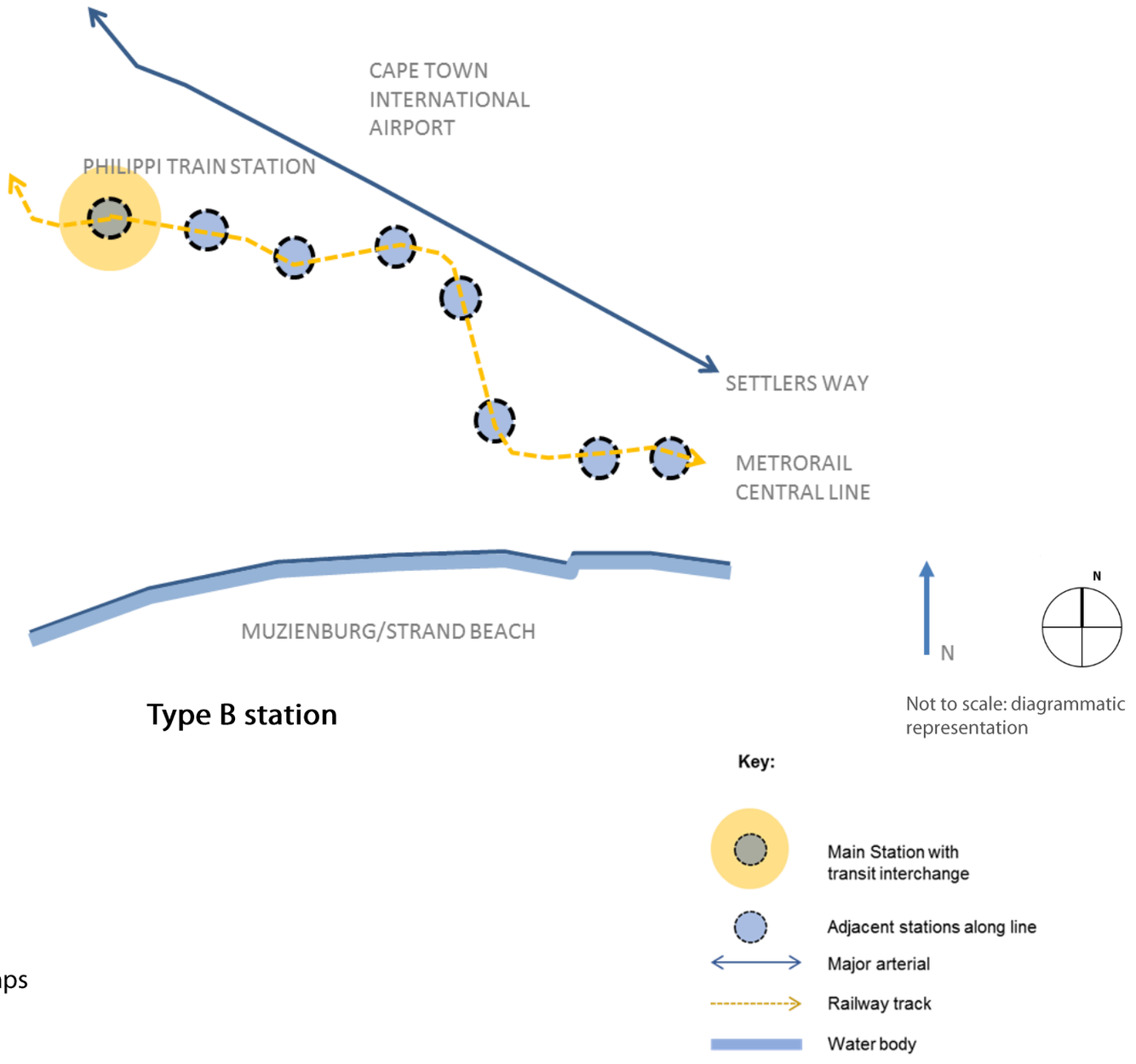
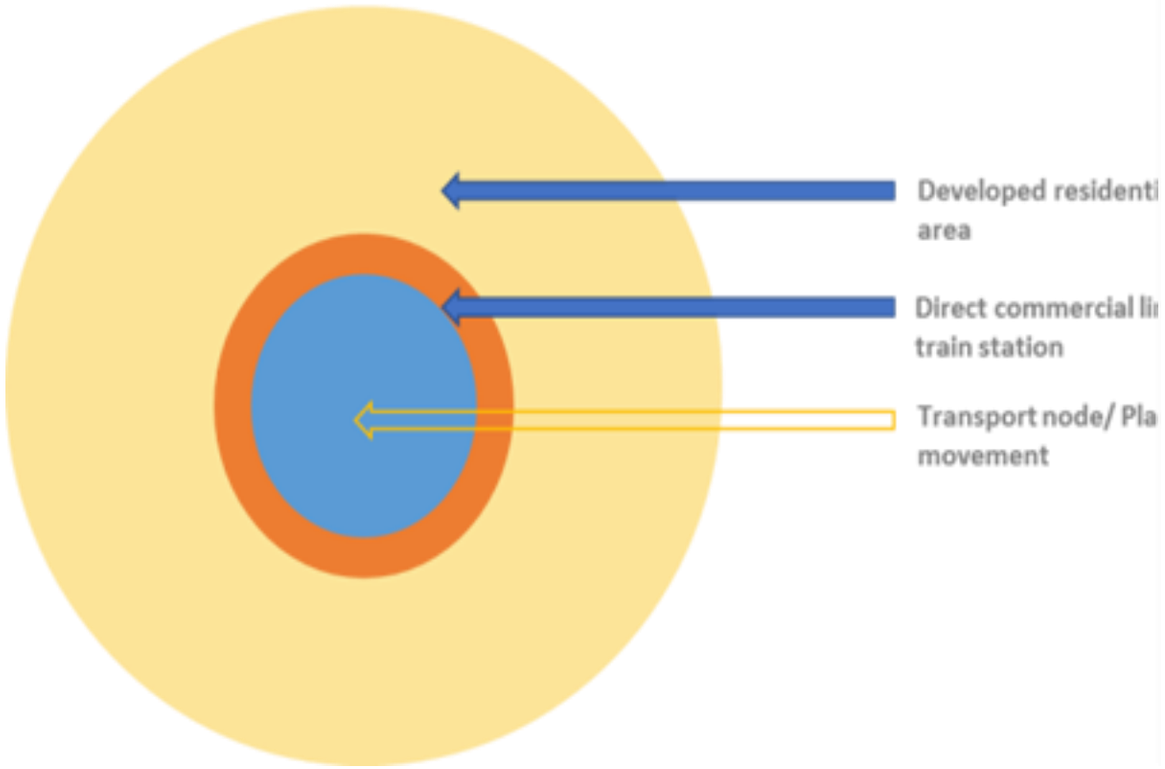
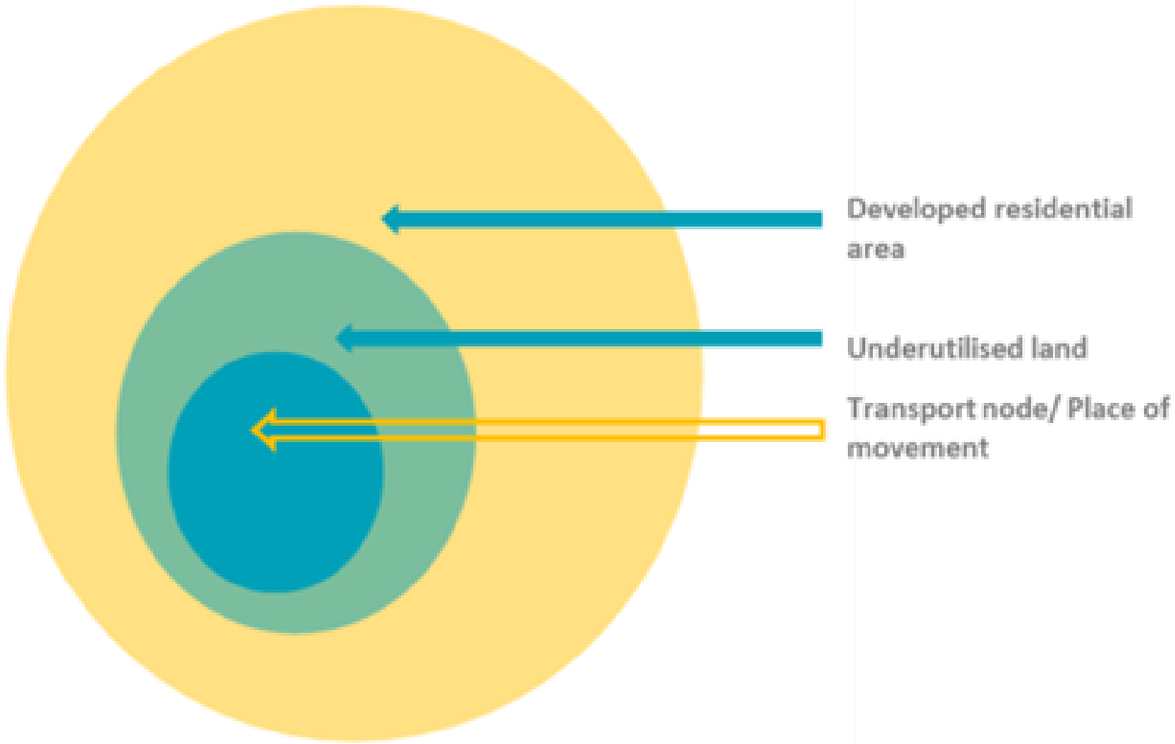


Figure 32: Diagrammatic comparison of the two stations – base map from Google maps

South African socio-spatial patterns are evident in figure32a& b. These are two suburban areas, where figure 16a has better integrated neighborhoods, leaving no underutilised land surrounding the train station. The train stations are also at close range with adjacent train stations throughout the railway line with a distance range of 0,7 to 1,7 kilometers from station to station. Making train travel time set to be at two minutes from one station to another.

Figure 32b illustrates where the train stations are further apart from each other with a distance range of 1,6 to 2,3 kilometers and a train travel time ranges from three minutes to four minutes. This often leaves minimal to non-activities surrounding the train stations where one would find underutilised land surrounding the train station, leaving opportunities for informal settlements or other informal activities to take place.





Type A station

Type B station

Figure 33: Diagrammatic conclusion of comparison between Type A and Type B train stations.

Findings recorded include:

Type A station

Based on observation

- Stations in close proximity.
- Stations are integrated with the neighbourhood.
- Close to mixed land use.
- Close range to public spaces

Type B station

Based on observation

- Stations far apart from each other.
- Stations are less integrated with the neighbourhood.
- Lack of mixed-used integration (more fragmented areas).
- More opportunity for land invasion due to underutilised land surrounding the train stations.

Furthermore, when it comes to sustainable developments towards urbanisation, figure 33a, has better integrated neighborhoods, which might require less or no altering in terms of infrastructure. Figure 33b, has a greater potential to new integrated neighborhoods, with better implantations of TOD Principles and other applications of urban design methodologies.

In the case of Philippi, the government's fixed investment should take shape in places of potential successful economic growth. The farming sector could play a big role in drawing private-sector investment, which could be seen as another form of creating other sustainable economic activities for the greater Philippi. This can contribute to the greater Philippi being self-sustaining towards basic needs, and economic growth through teaching basic farming methods to small scale farmers.

3.1.2. Movement analyse

Compact Neighbourhood MOWBRAY
- TYPE A

Sprawling Suburb PHILIPPI
- TYPE B



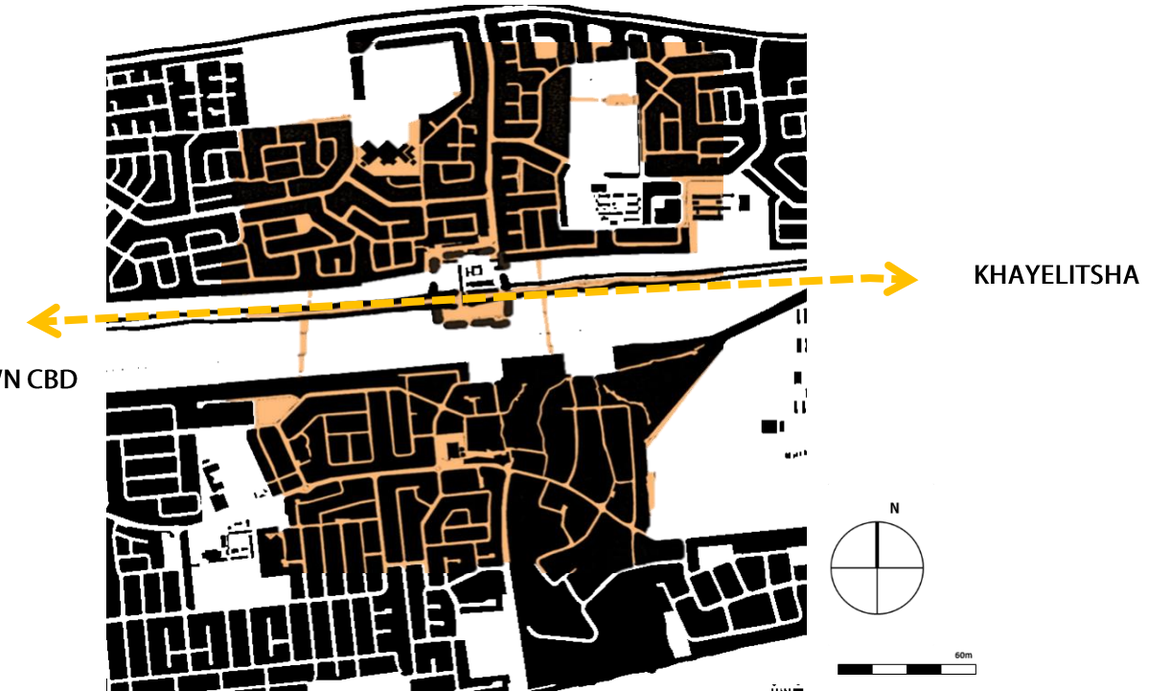
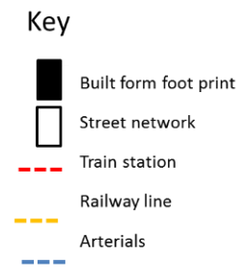


Figure 34: Layout planning comparison between Type A and Type B train stations



Compact neighborhood

- Permeable walk through a grid - thoroughfare street network.
- Train station surrounded by mixed land use
- Train station forms part of a transport interchange.

Sprawling suburb

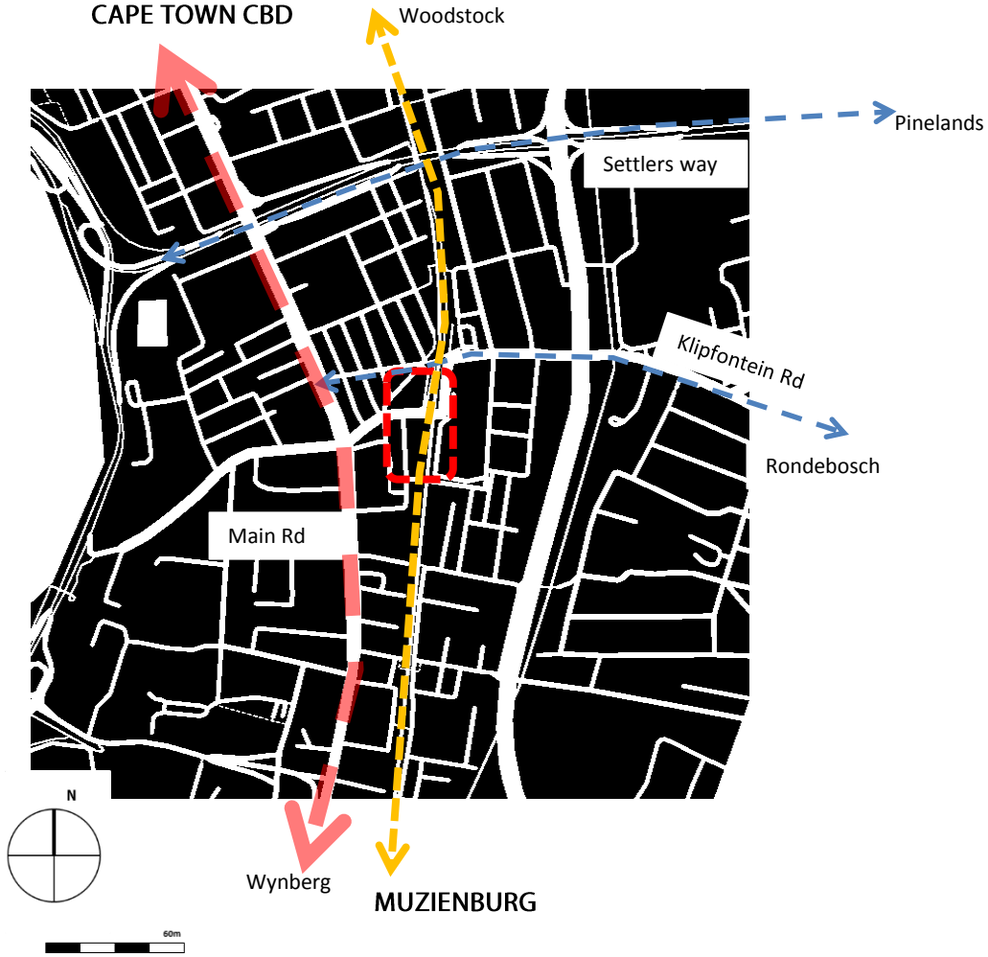
- Cul-de-sacs and winding streets makes poor linkage for walking from one point to the other.
- Fragmented use of facilities.
- Not walker-friendly.

The movement in Mowbray (figure 34a) illustrates good functional qualities of connectivity that connects people to their destination. This comes with an urban fabric which is knit together in a series of streets, walking and cycling paths that form a greater transportation networks (Healthy spaces & places, 2009).

Good connectivity provides easy access to key destinations for pedestrians. Excellent connectivity actively seeks to discourage car use by making local trips easier and more pleasant by foot than by car.

3.1.2. Movement analyse

Connections linked MOWBRAY
- TYPE A



Connection limited PHILIPPI
- TYPE B

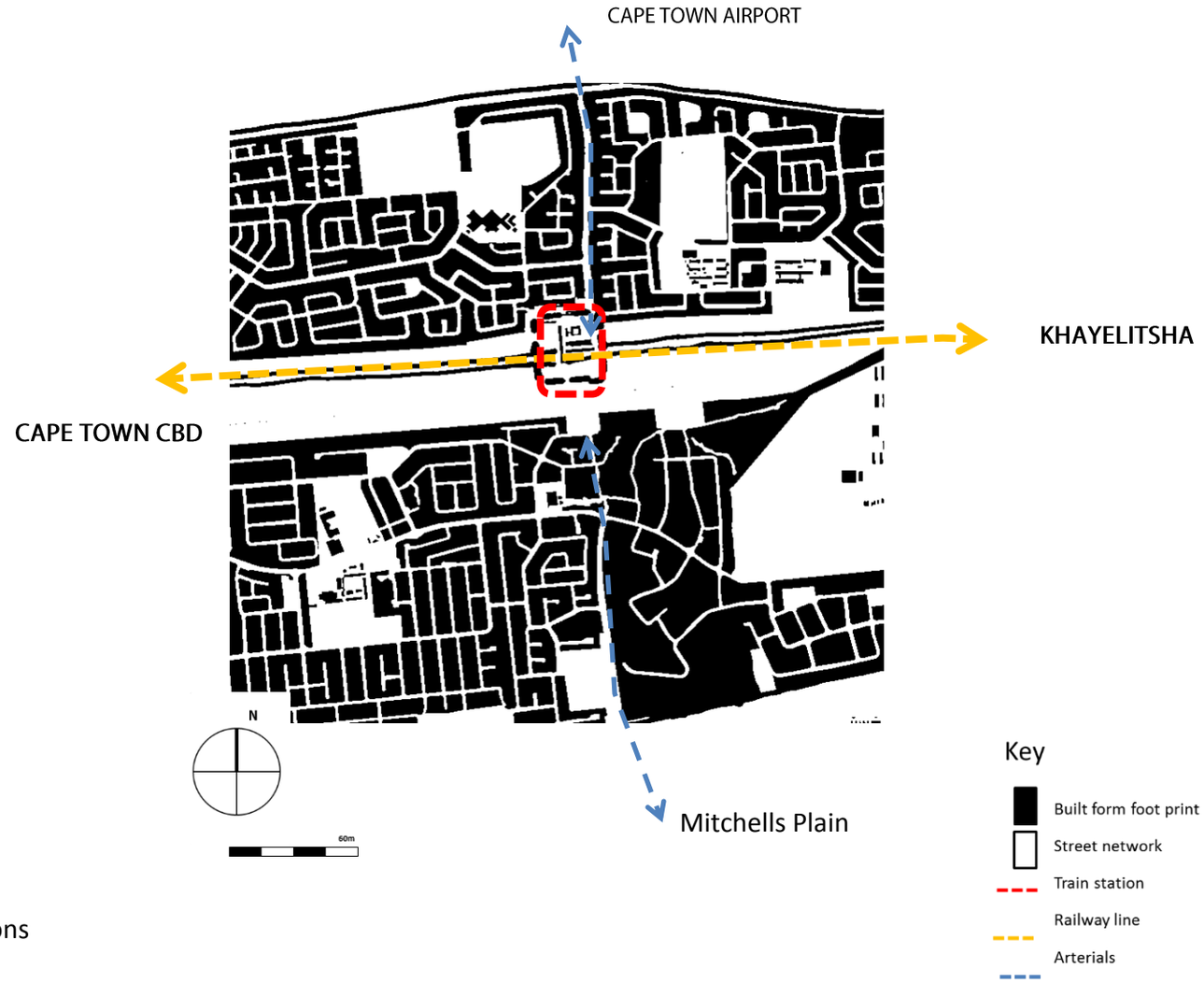


Figure 35: Layout vehicular planning comparison between Type A and Type B train stations

Compact neighborhood

Mowbray's (figure 35a) high permeability enables for a network of short links, with numerous intersections. The permeable path network also significantly encourages residents to walk to from one place to another in opposed to driving.

Sprawling suburb

In figure 35b, Philippi's numerous dead-ends, restricts access from neighborhood roads to main road. Which often maximizes travel time to get out of the neighborhood. The irony in Philippi's street network, the street network was based more on a vehicular dominated neighbourhood . However, majority of people who live in Philippi predominately use and depend on public transport as a source of movement (Healthy spaces & places, 2009).

3.1.4. Conclusion

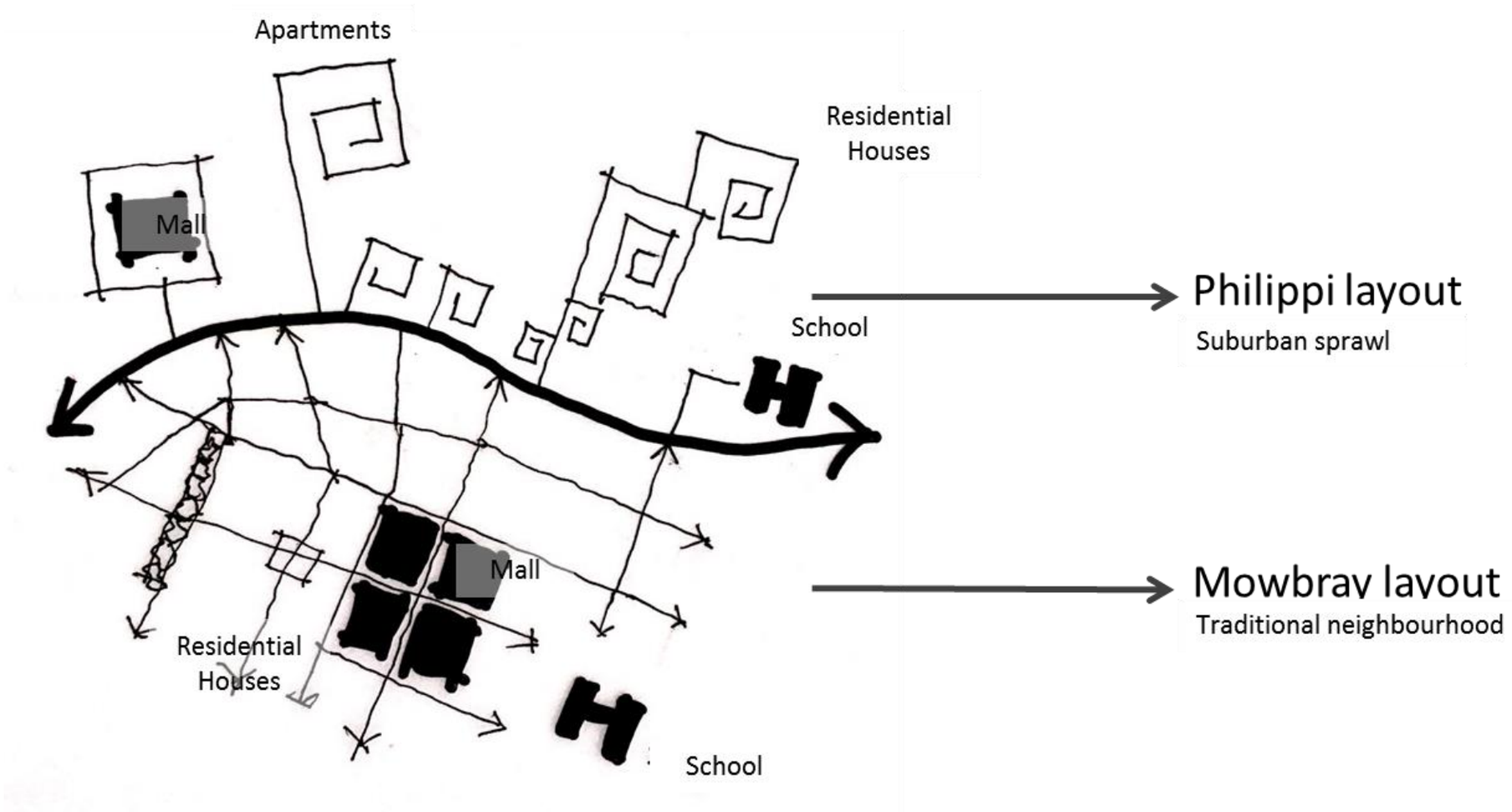


Figure 36: Diagrammatic conclusion of comparison between Type A and Type B train stations – adapted from original image –(Healthy spaces & places, 2009)

There is a higher permeability of movement in Mowbray than in Philippi, where Mowbray consists of shorter links and a reasonable number of intersections that link one place to another. A more connected neighbourhood reduces travel time, making it easy to move around. Philippi, on the other hand, has numerous dead-ends and a decreased connectivity making travel time much longer.

The limited number of connected routes decreases the privilege of having options to navigate around the greater neighbourhood. This, however, also makes it difficult for creating an accessible transportation system that would require more direct routes covered in a shorter distance.

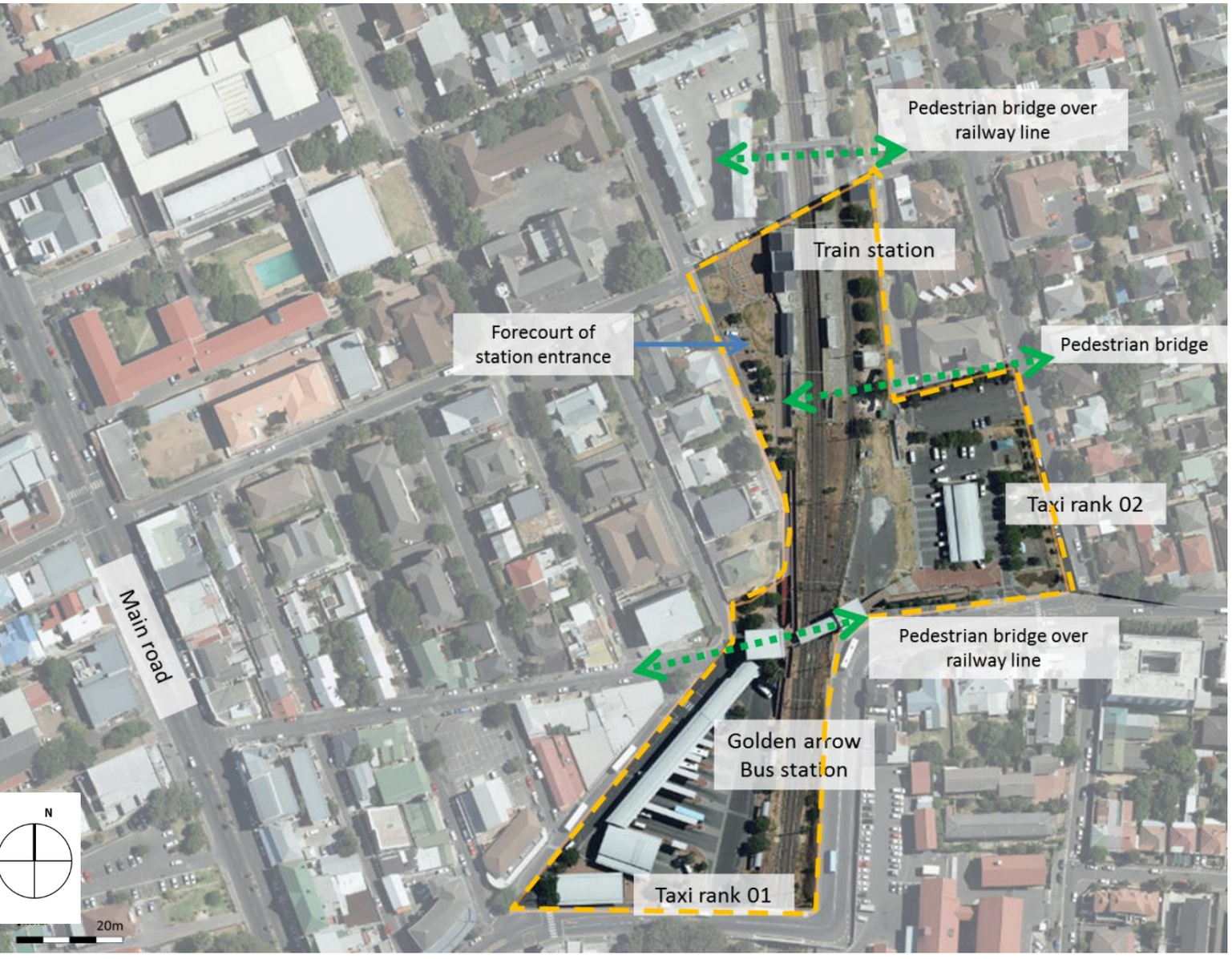


Figure 37: Mowbray station transport interchange (Type A)train stations – base map from Google maps

As an observation made in Mowbray (figure 37):

As a result of a working layout for a transport interchange Mowbray's connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, which creates a more accessible and resilient transportation system.

Mowbray's transport interchange consists of a bus terminal, taxi ranks on either sides of the railway line and three thoroughfare NMT routes. Pedestrian have an easy access to three high order routes that formulate a permeable street connection on either side of the railway. This includes: Voortrekker Rd, Victoria Rd (Main Rd) .Durban- Klipfontein Rd and Liesbeeck Parkway this also includes, other neighbourhood routes within the train station surroundings, which link residential - (single standing & apartments), educational - (schools & universities) and commercial, retail and corporate places.

Locating study area

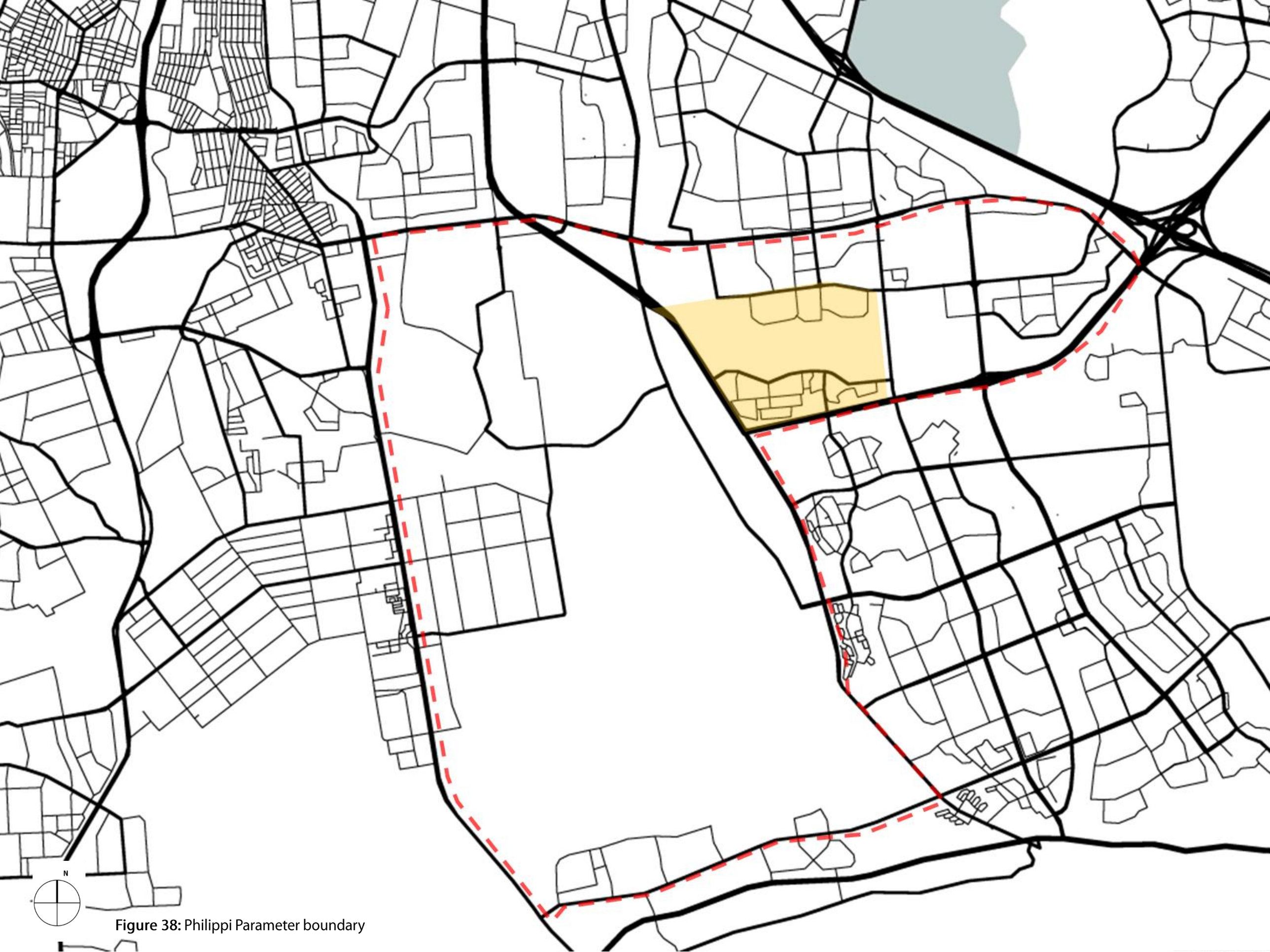
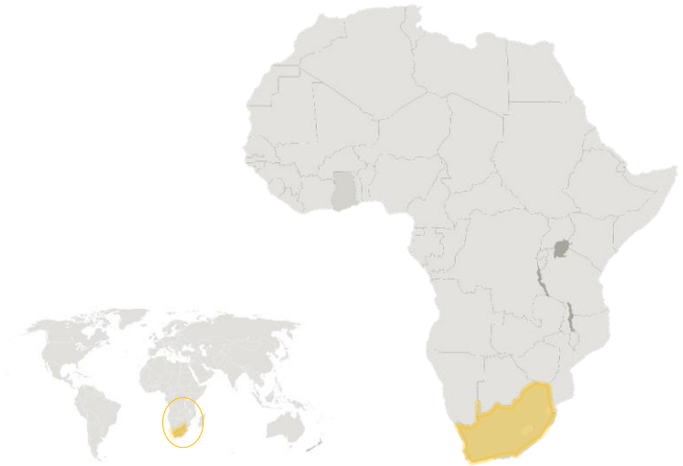


Figure 38: Philippi Parameter boundary

3.2.1. Locating the study area



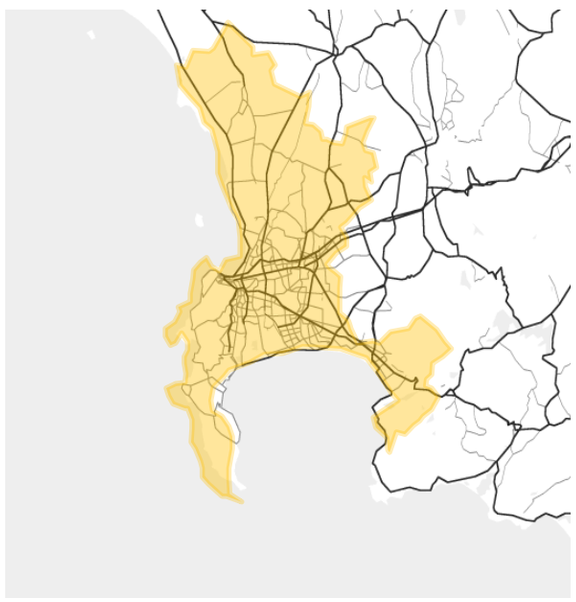
World map, locating South Africa



South Africa's map, locating the Western Cape



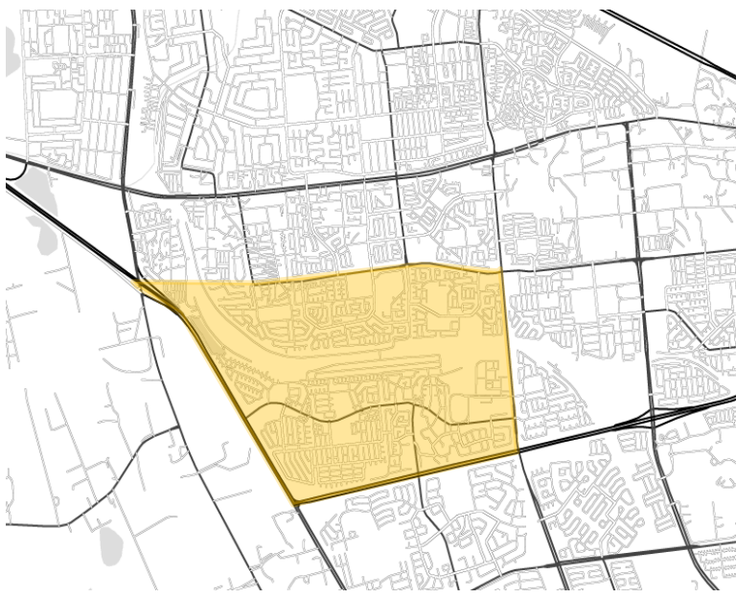
Western Cape's map, locating the Cape Metropolitan



Cape Metropolitan



Philippi parameter



Greater Browns Farm

Figure 39: Site selection in context – base map from Google maps

N

Maps not to scale

3.2.2. Putting history into perspective: Philippi

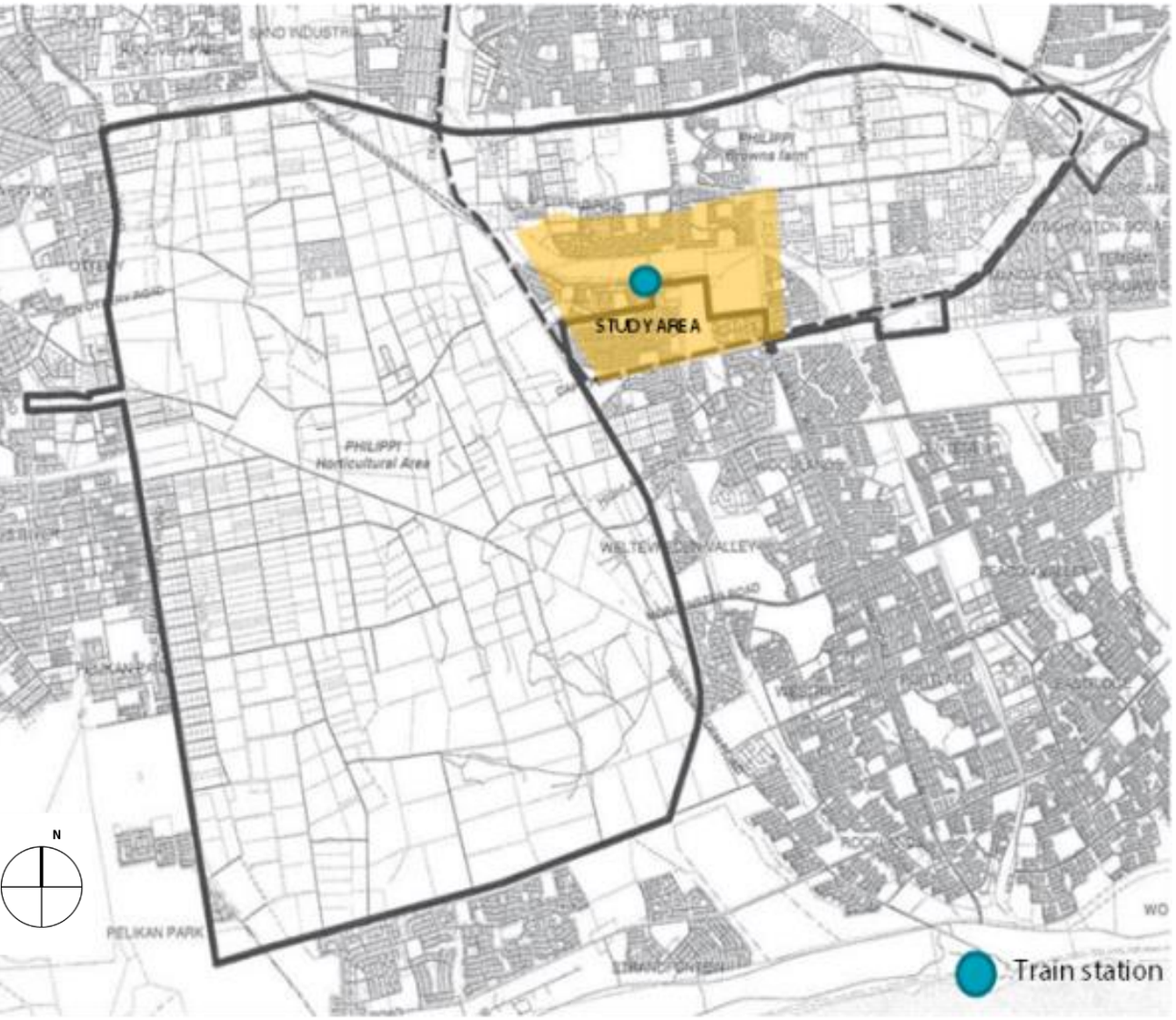


Figure 40: Philippi Horticulture Area (PHA) and earlier designated areas pre 1967 delineation base map – CoCT(2007).

Philippi is one of the largest townships in South Africa (figure 40) that is still facing challenges highlighted by The Township Transformation Timeline, (2009) when it comes to urban integration. Philippi is recognized as a food production area with a strong history in horticulture that dates back to the mid 1800's (Battersby and Haysom, 2012).



Figure 41: Narrative of History – source

According to Rabe (1992), the Cape Flat agricultural farming, began on the arrival of two groups of German settlers, who first arrived in 1877 and the other in 1883. The farmers originated from the Lüneburger Heide in Germany. They were commissioned by the then government to supply the growing need of fresh vegetables in the city of Cape Town.

3.2.3. Study Area morphology

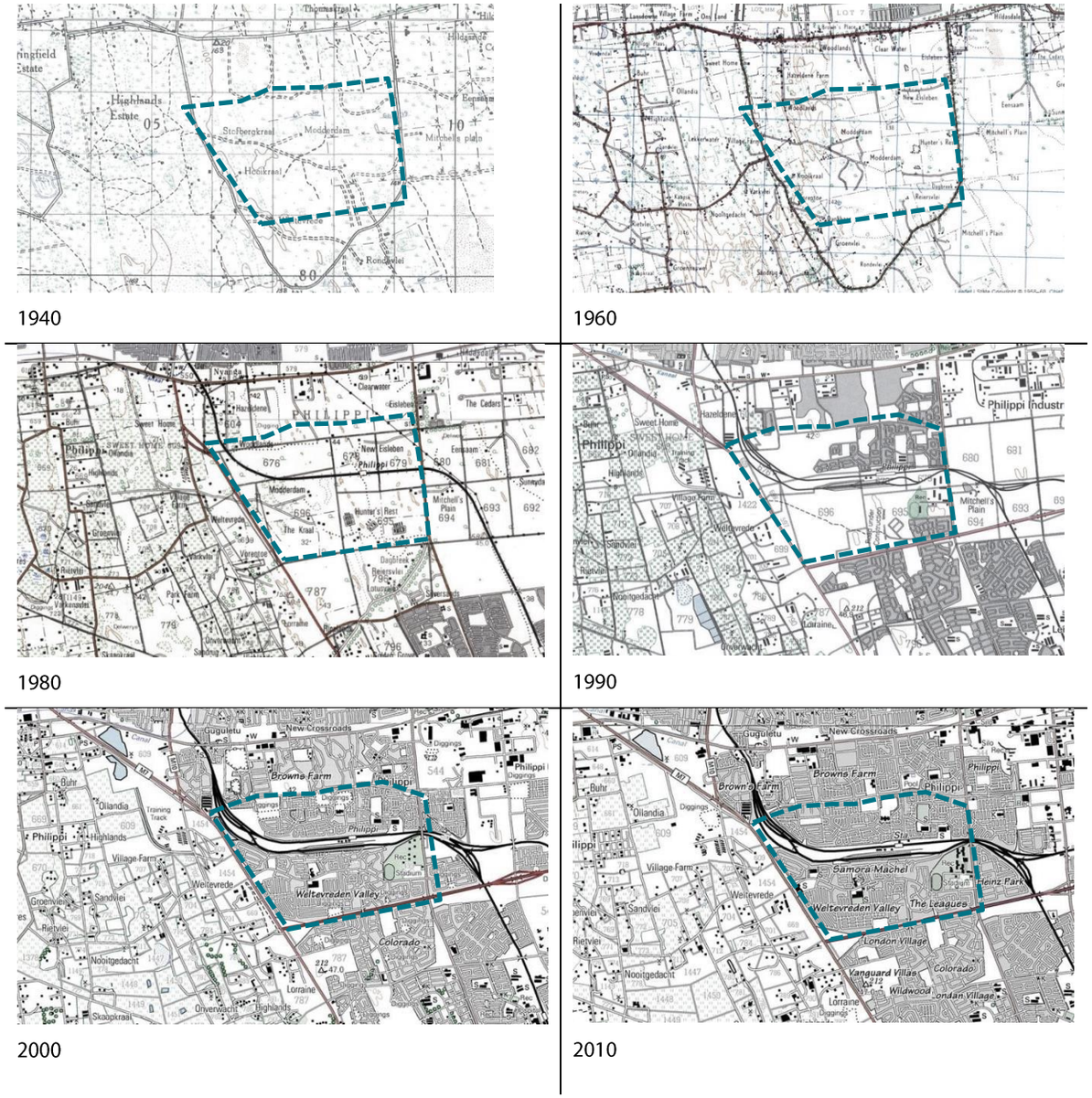


Figure 42: Map timeline from 1940-2010 base map - *Rural, Land reform Dept.*

Figure 42, shows an outline of what is regarded as the Philippi Horticulture Area (PHA), which includes Philippi Browns farm, where the chosen study location lays. Historically, the study area was referred to as *'The Dunes'* which was used for grazing. This was done due to seasonal approach to the farming where planting and (horticulture productions) and livestock alternated during different seasons. The Dunes existed up until the 1970's. During the early 1970's majority of Browns Farms was converted to townships figure 24 (Battersby-Lennard and Haysom, 2012).

Over the past years Philippi, has increasingly became a place of refuge from the political conflict and violence in the former homelands (City of Cape Town, 2007). Another one of the major factors contributing to the growth in the number of residents in the Philippi area was when farms in Mitchells Plain were eliminated.

Leading to a major influx of people seeking places to inhabit towards neighboring communities. Other factors were also resulted by a large number of laborers being deposed and having to move elsewhere as they did not fall under categories of the apartheid state's racial housing relocation process (Adlard, 2009).

Today, the city of Cape Town, the larger Philippi faces unique challenges. One of the biggest challenges is managing and administering large portions of land. Majority of these challenges come with land that carries a rural status sits within the greater urban context. Philippi is one of the largest townships in the Cape flats area that suffer from significant poverty and the great need for housing and basic infrastructure (Battersby-Lennard and Haysom, 2012)

These challenges are further escalated by urbanisation. The number of people coming into the city and being filtered into township underutilised land is increasing the number of informal

Today, the city of Cape Town, the larger Philippi faces unique challenges. One of the biggest challenges is managing and administering large portions of land. Majority of these challenges come with land that carries a rural status sits within the greater urban context. Philippi is one of the largest townships in the Cape flats area that suffer from significant poverty and the great need for housing and basic infrastructure (Battersby-Lennard and Haysom, 2012)

These challenges are further escalated by urbanisation. The number of people coming into the city and being filtered into township underutilised land is increasing the number of informal

Conclusion: Tensions and pressure for housing

The greater community of Philippi does not share similar views when it comes to preserving Philippi Horticulture Area (PHA) and elevating the pressure of informal settlement expansion. However a suggestion to this matter would be to consider looking at the communities view the future of the area. A level of engagement and understanding of the past can create sensitivity to how one responds to the land in treat. This might help reduce conflicting perspectives of what is regarded as urban or non-urban, and what can be afforded to developers or Human Settlements as portion of land within the Philippi Horticulture Area (PHA) to enable housing development outside of the PHA.

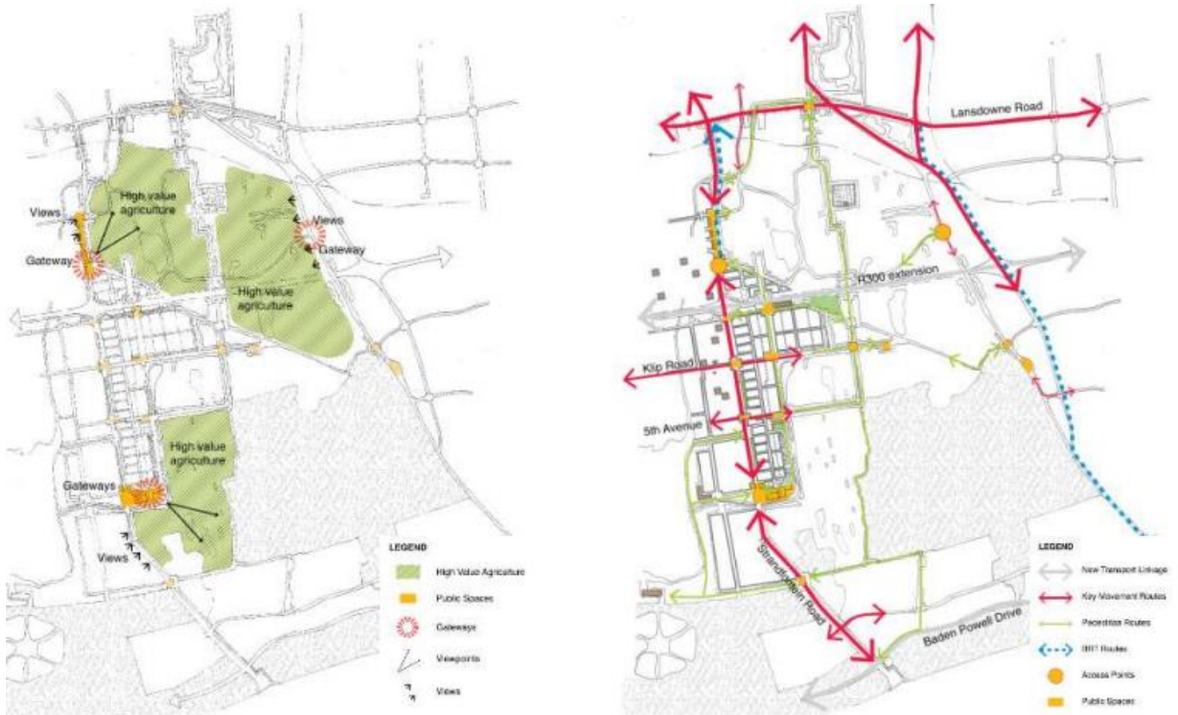


Figure 43: Diagrams illustrating proposed gateways to the PHA and Key Movement Routes and Linkages to/from the PHA – Source: Setplan

Furthermore the policies that suggest the retention of the PHA as an economic resource encourage the acknowledgement of this action. In support of the PHA development framework design Figure 43 &44,(Setplan, *not dated)* on the edges and areas neighboring the PHA, new developments that are linked to the PHA could possibly offer personal safety and security of continued farming and sustainable employment practices.



Figure 44: Masterplan – Source: Setplan

The protection of farmers, their farming equipment and produce can pose as an incentive to how new development frameworks (CoCT, 2012). Overall this would help sustain the PHA and help maintain a controlled balance between, job creations, a need for housing and a constant contribute to the economy and food system of the greater urban context.

3.3. Key informants

3.3.1. Site informants

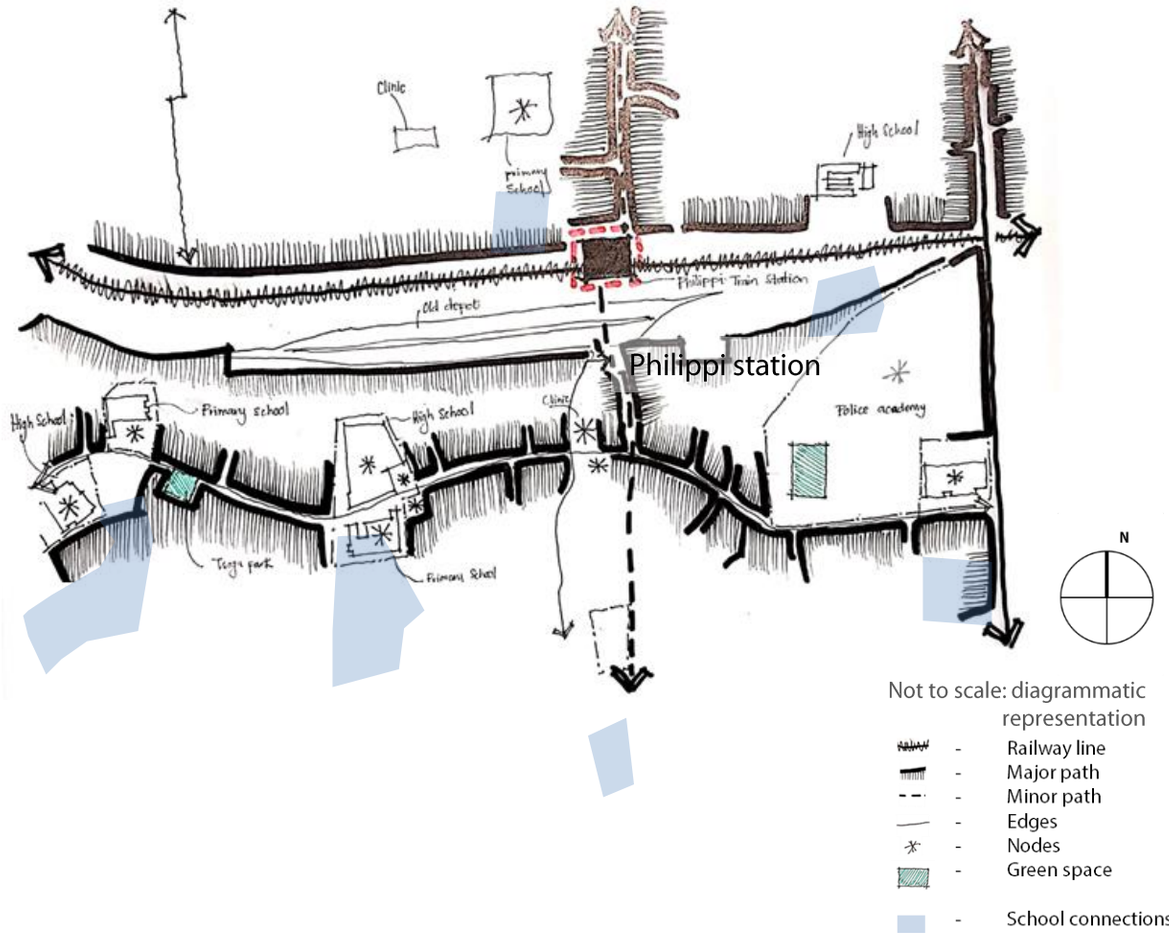


Figure 45: Existing movement network and Edges

When identifying the nodes and hard edges, the educational facilities are well spread out. Primary schools and High Schools are conveniently placed within one vicinity this has also helped created solid edges alongside a movement network.

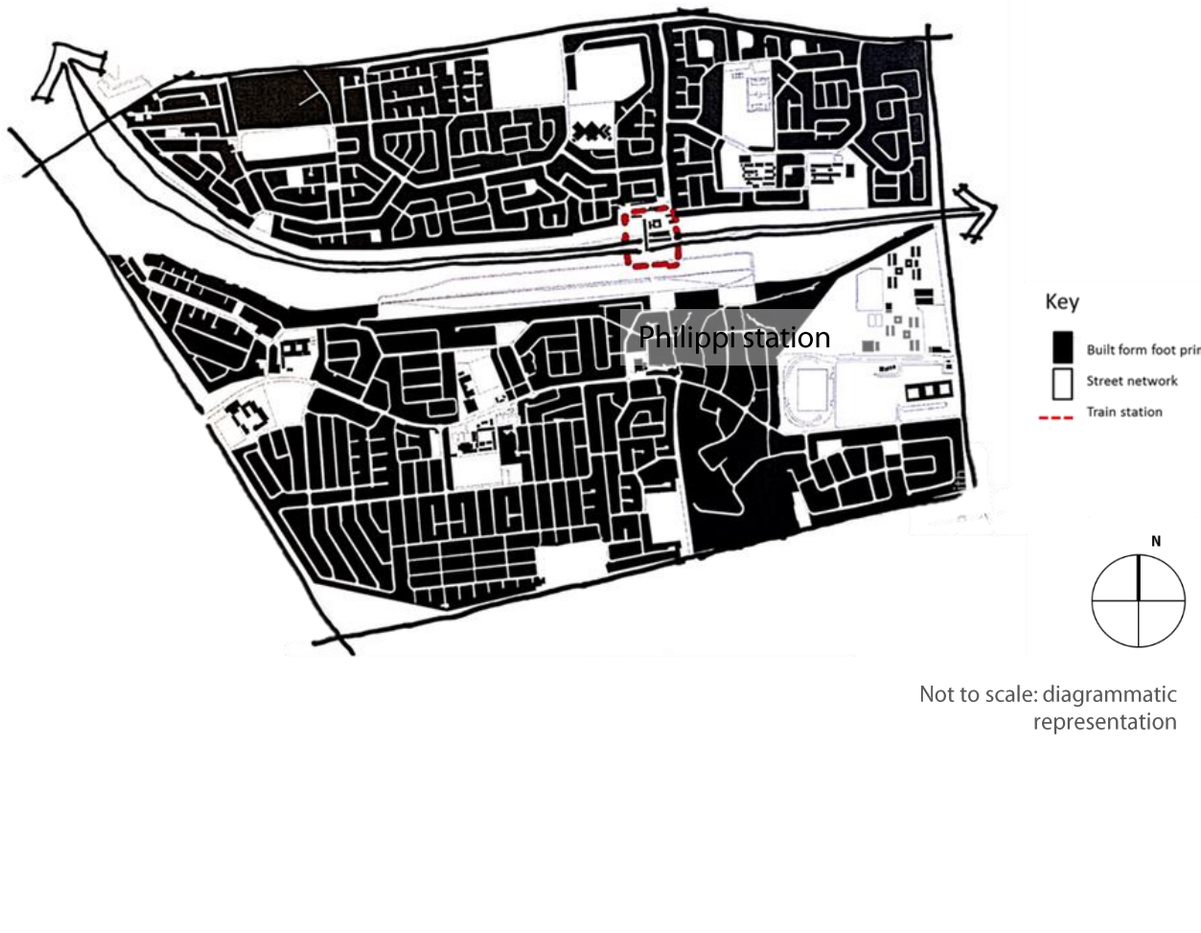


Figure 46: Existing movement network and Edges

The site was initially based on a sprawling suburb, whereby currently the site is dominated by cul-de-sacs. One of the approaches to creating a livable urban environment accessible mobility choices need to be enhanced.

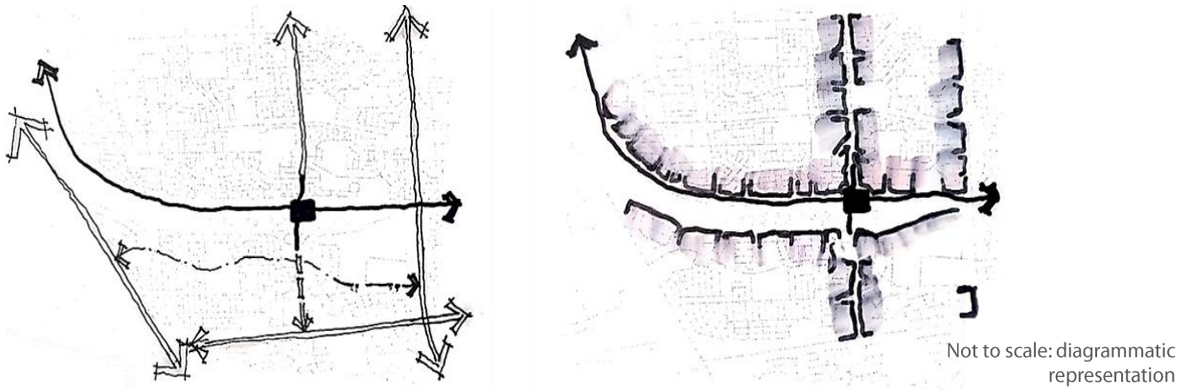


Figure 47: Existing movement network and Edges *(respectively)*

As observed on site, the existing movement network includes (figure 47a); two major arterials, namely, the *M22* on the east, *R300* on the south and *Jakes Gerwel Drive* on the west these route a mostly used for motorised travel.

Ingulube Road is a direct link from the north side of the station. What links the train station to the south side of the neighborhood is a pedestrian bridge that further leads to *Parkway road* onto the *R300.* In-between the R300 and the train station lay a spine road *Oliver Tambo Drive.*

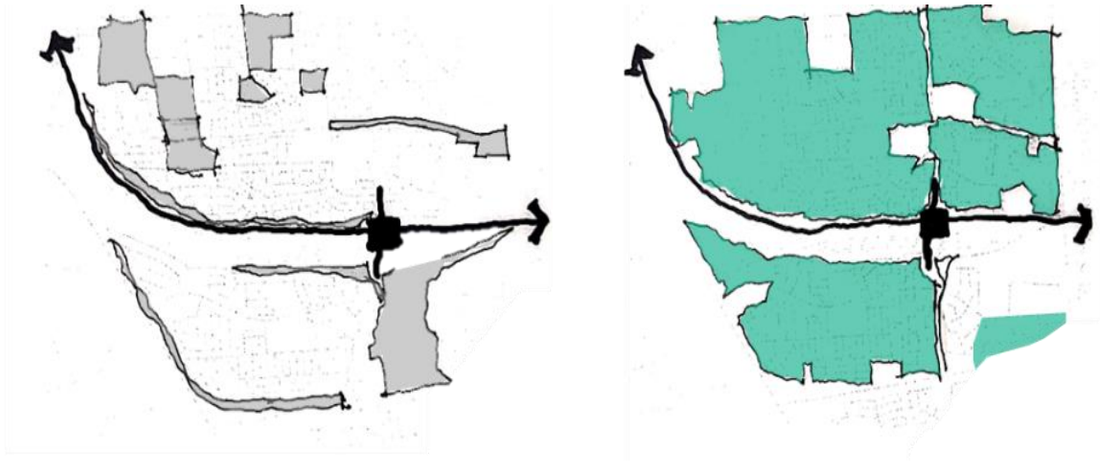


Figure 48: Informal settlements and Low density residential houses *(respectively)*

There are pockets of informal settlements spread throughout the community (figure 48a), mostly located alongside transport routes. Neighborhoods surrounding Philippi are made of mostly low density residential dwellings (figure 48b),

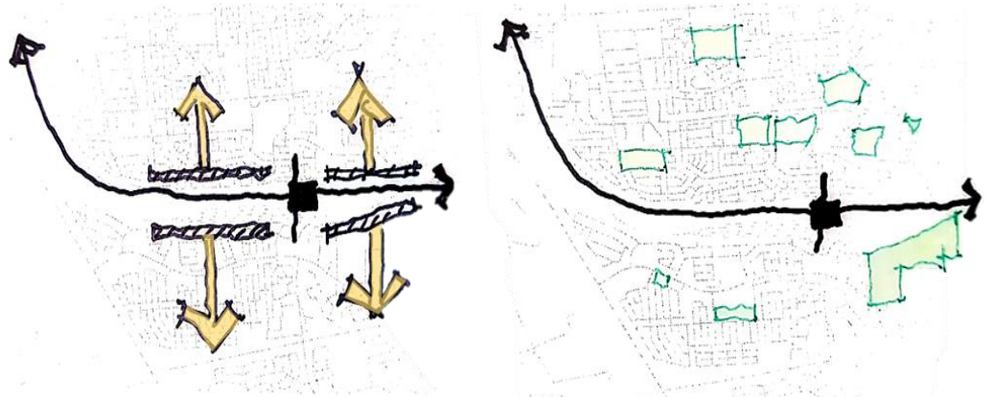


Figure 49: Barrier of neighbourhood connection and Existing limited green spaces *(respectively)*

The railway line figure 49a acts as a divider between the neighboring communities. Which can be seen as s blocks out for a continuous linkage between the north and south side of the train station. Philippi has numerous fragmented open spaces (figure 33b) this also includes many functioning infrastructure and facilities surrounding the train station making it a poorly connected space.

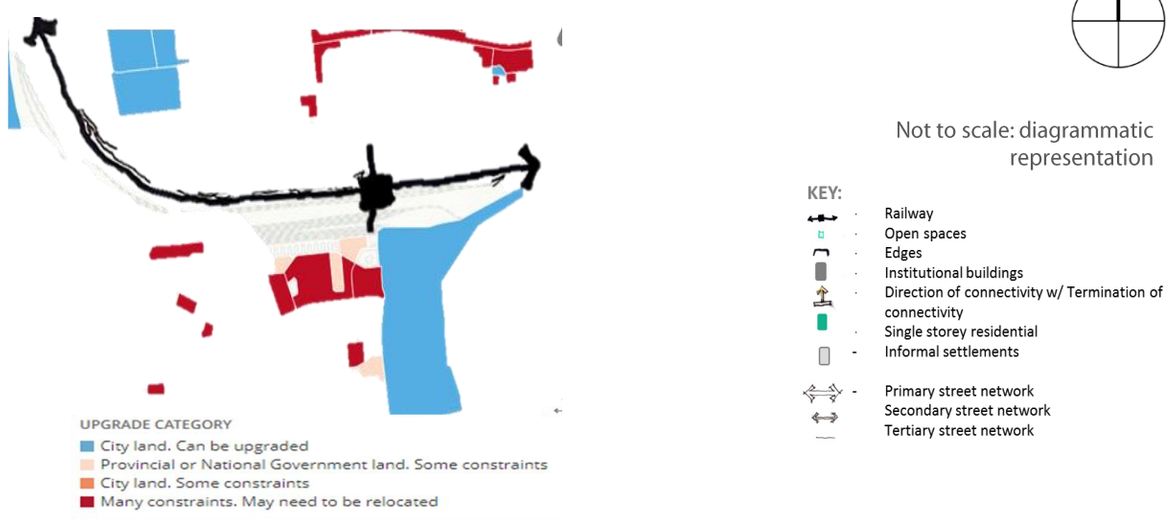


Figure 50: Existing Land ownership

Existing Land use is indicated on figure 50). (Areas highlighted are a, stand as informal settlements currently.

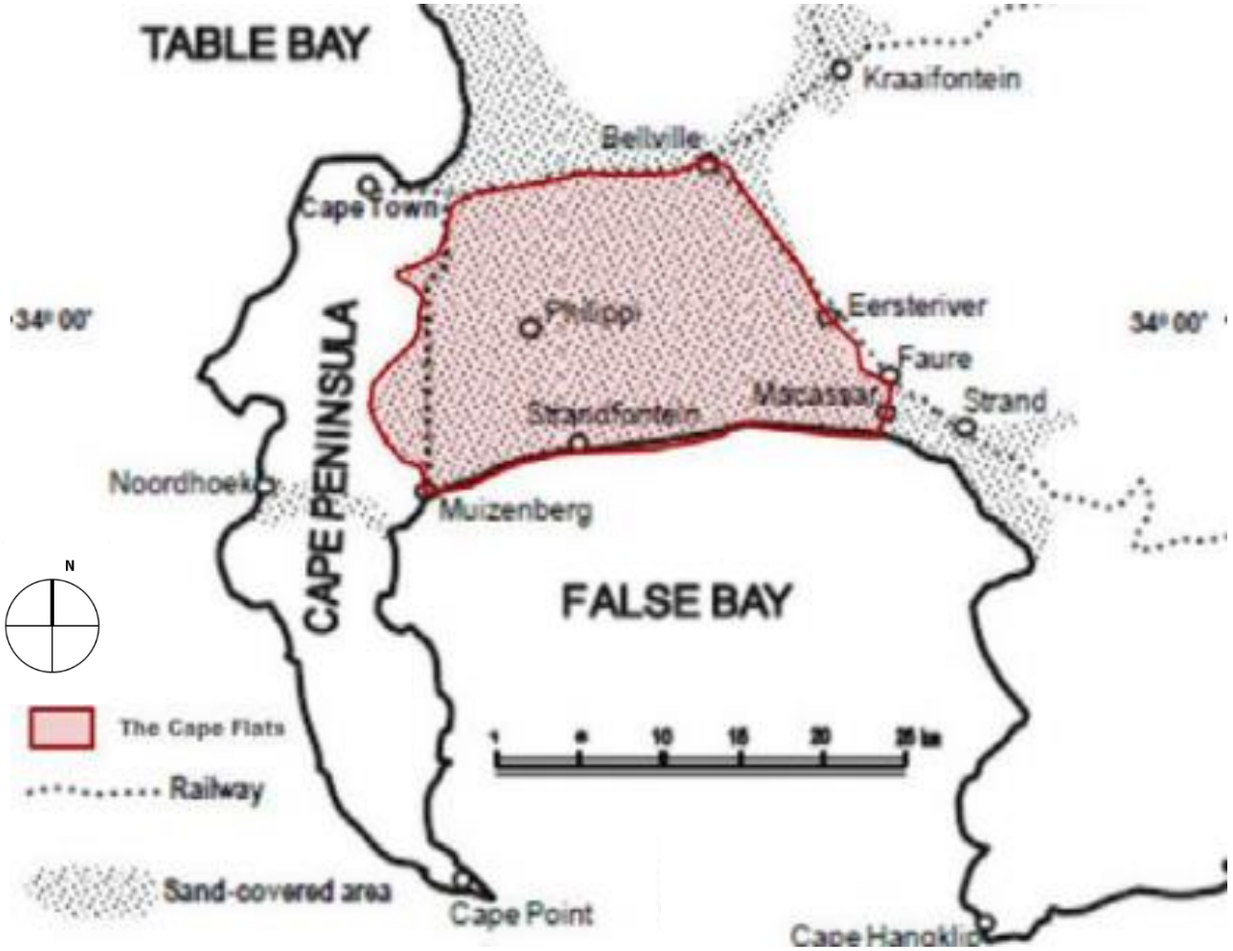


Figure 51: The Cape Flats low plane land –source Adelana et al, 2010.

Through the above analysis, the study area currently has many poorly planned and neglected public spaces which make up an unpleasant physical environment. Inadequate housing stands out on the site as part of the township's fabric. The site sits on the Cape flat which is predominantly (figure 51) on low land prone making some part of the areas prone to flooding which often makes the site dangerous or less desirable to inhabit (Adelana et al, 2010). However, one would find many scattered informal settlements on such places. Climate change is constantly on the rise, this often has an impact on such settlements making them vulnerable and exposed to extreme weather conditions during bad seasons.

However, with that said, in order to create a livable urban environment, housing becomes one of the major interventions required to create this type of environment. The site also has a high presence of informal trading; this can be integrated within the Intervention which will make the greater community a more multi-functional environment. Adding an economic interventions layer onto the site will vastly contribute to the appropriate use of land and largely contribute to people's livelihoods overall by integrating all these interventions this leads to a more inclusive neighborhood (COGTA , 2016).

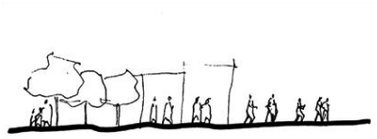
3.4. TOD Analysis on Philippi train station



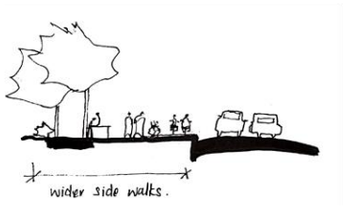
COMPACT: Collaboration through the city, makes it more connected, with everything close to each other.



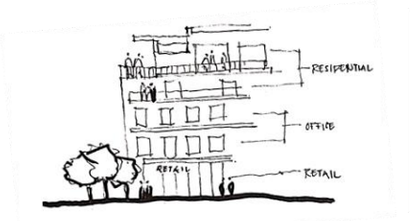
Ddensification: Building up, increases the capacity of allowing more people to occupy space, rather than building outwards.



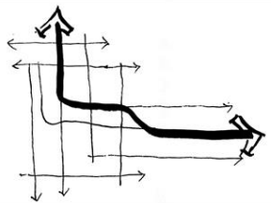
WALKING: Pedestrians contribute towards vibrant spaces (streets), It also assure safety. Use fan walks to connect these spaces.



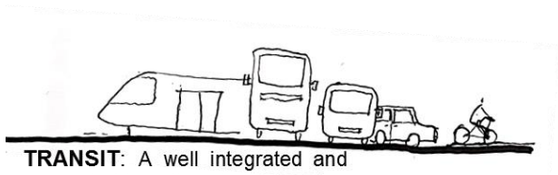
CYCLING: Efficient and convenient way of travel. More interactive streets.



MIXED USE: A mix of activities, means integrated communities shorter trips



CONNECTED SPACES: Highly permeable spaces allows for successful connected networks with a neighbourhood. These networks would included pedestrians, cyclists and public transit.



TRANSIT: A well integrated and connected transit system promotes densification.



AFFORDABILTY: This allows accessible use of what is regarded as public use. I.e. Transit systems and accommodation.

Figure 52: TOD Principles – adapted from ITDP (2017)

Spatial patterns are encouraged by movement networks, and together these networks create a connected environment (Hillier, 2009). Transit forms part of these networks and this research will focus on spatial patterns that are concretized by apartheid architecture. Through this research I want to propose a compliment to TODs (figure 52) by designing a framework in places where the gaps found within railway transit land can be recognized as new urban neighborhoods.

TOD Principles will highly influence the proposed design concept that will be supported by existing theory. These Principles include: walking, cycling, connected spaces, transit, mixing use, densification, compact and affordability.

Current TOD qualities surrounding Philippi train station:

Current TOD qualities surrounding Philippi train station: walking, where most people walk to their choice of commute (buses, taxis or trains). Not much cycling is present; this could be due to poor sidewalk quality or no sidewalks onsite.

3.4. 1. Movement in greater context

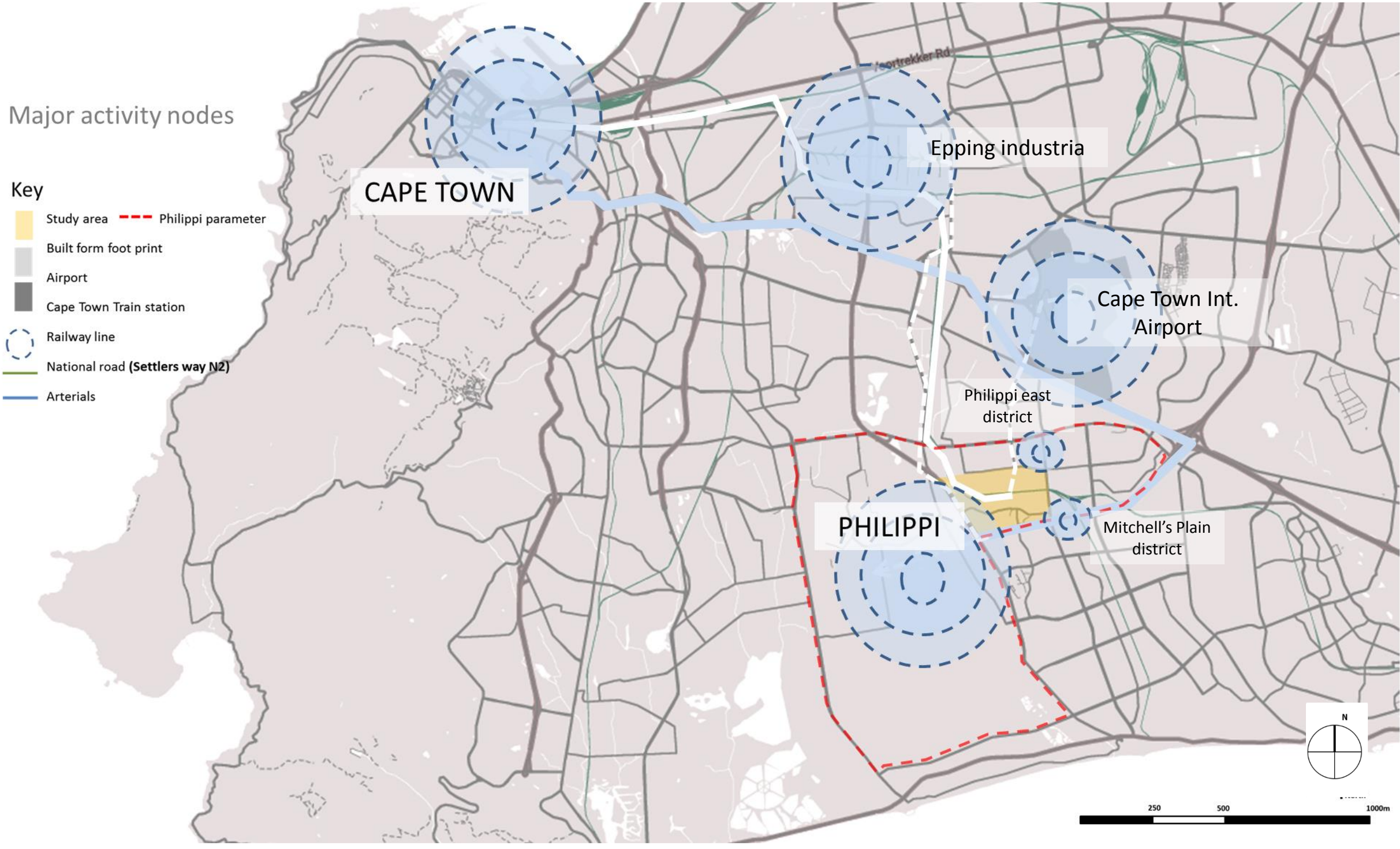


Figure 53: Movement analysis in the greater context (from site to the greater metropolitan area)

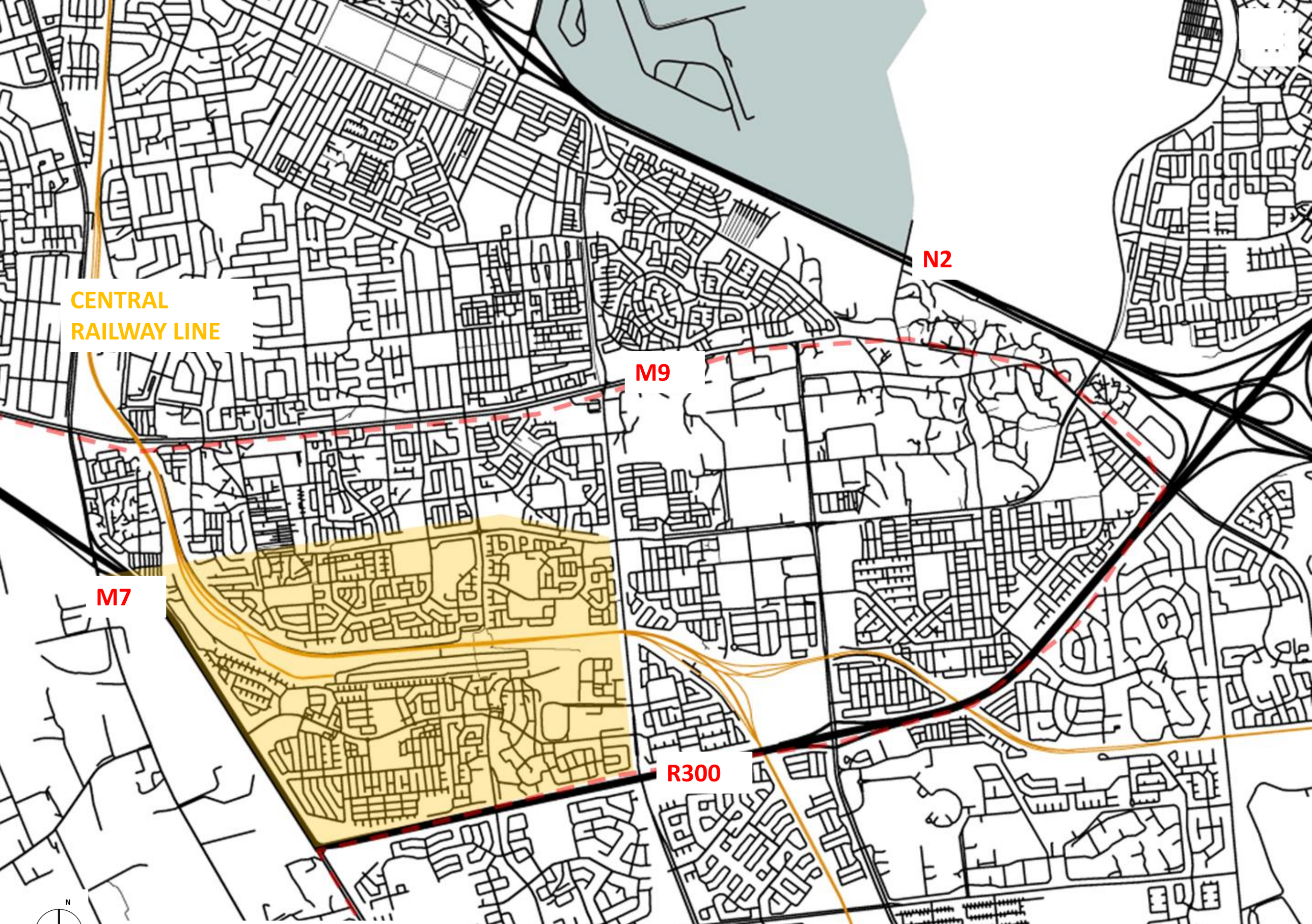


Figure 54: Selected study area parameter.

3.4.2. Existing Movement and Footprint



Figure 55 – Philippi train station *(north side)*

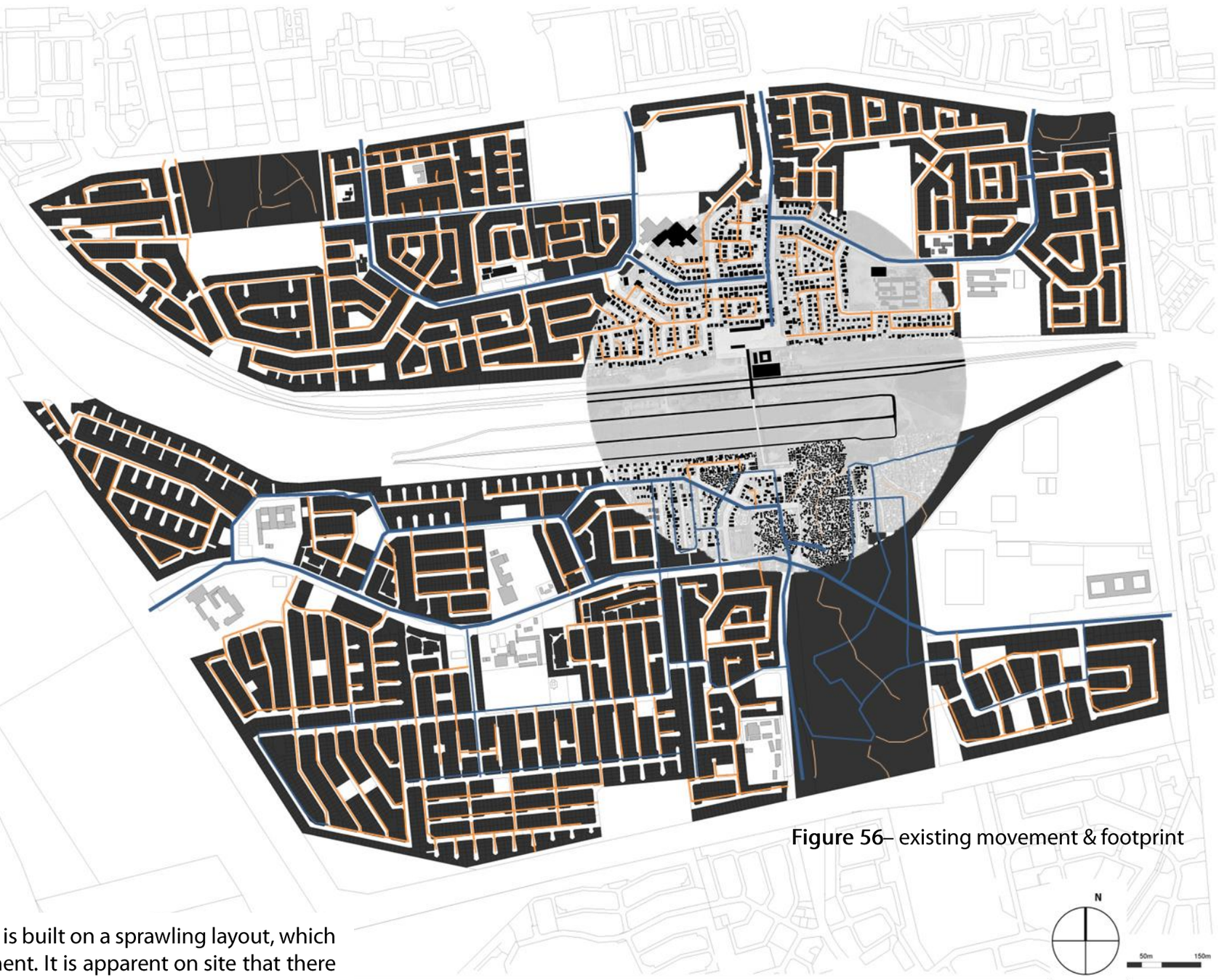


Figure 56– existing movement & footprint

The built form, (figure 56) in the greater neighbourhood is built on a sprawling layout, which opposes possibilities of creating a sustainable environment. It is apparent on site that there are limited thoroughfares and many dead ends. This restricts walkability on site when looking at the first principal of TOD elements:

Walking/ Cycling

- Most people **walk to their choice of commute** (buses, taxis' or the train).
- **Not much cycling** is present, this could be due to poor sidewalk quality or no sidewalks onsite.

Transit

- There is a **small-scale taxi rank** adjacent to the train station and a few bus stops neighboring the train station Shows the possibility of integrating these **three modes of transport** to form **one transit node (figure 1.2).**

3.4.3.Land-use patterns



Figure 57 – Philippi train station surrounding residential area & commercial areas *(north side)*



Figure 58– Existing Land use

Key

- High School
- Primary school
- Residential houses (formal)
- Informal settlement
- Community facility
- Green structure
- Railway line
- Street network

Mixed uses

- There is a presence of **mixed use surrounding the train station** (figure 57) and alongside the main road leading to the train station.

Densification

The area is predominately occupied by low density buildings, whereby only two nodes the train station and the SAPs police academy stand out as high density buildings.

Affordability/ Challenges

- The one biggest **challenge is housing,** whereby because of low-income challenges faced by individuals. **Paying rent, putting aside money for transport to commute to work or school** and providing for

3.4.4. People and Activities

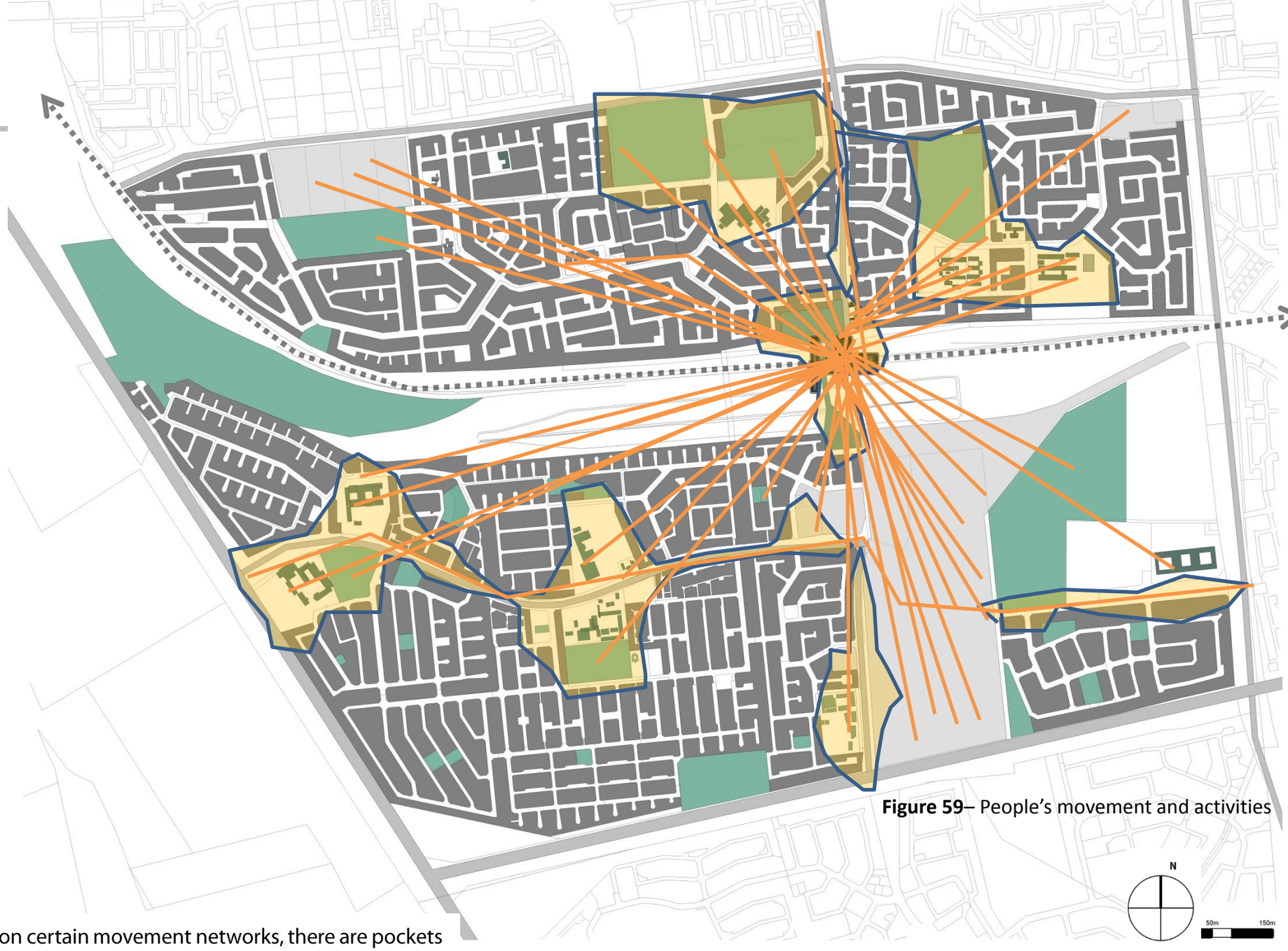


Figure 59– People's movement and activities

Looking at the neighbourhood parameter, on certain movement networks, there are pockets of attractions and places where people find worth to carryout daily activities. Some of these activities include; informal trading stands , repair shops and built infrastructure such as schools, health facilities and community centres.

As a result of a buzz of activity, some of these routes (highlighted on the figure 59), create a sense of public space, which translate into a more attractive and safe. However, when it comes to the conditions of the street infrastructure, disabled and elderly people might be exclude from such activities because of the poor state of sidewalks and often the degraded , cluttered and unmaintained sidewalks block off some movement routes for pedestrians only leaving movement for vehicles.

3.4.5. Quality of physical environment in Philippi









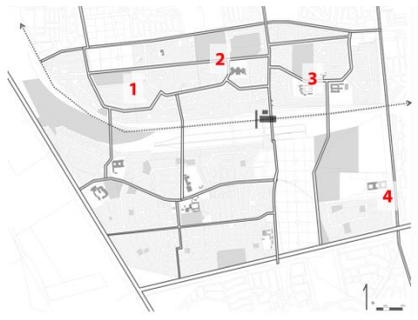
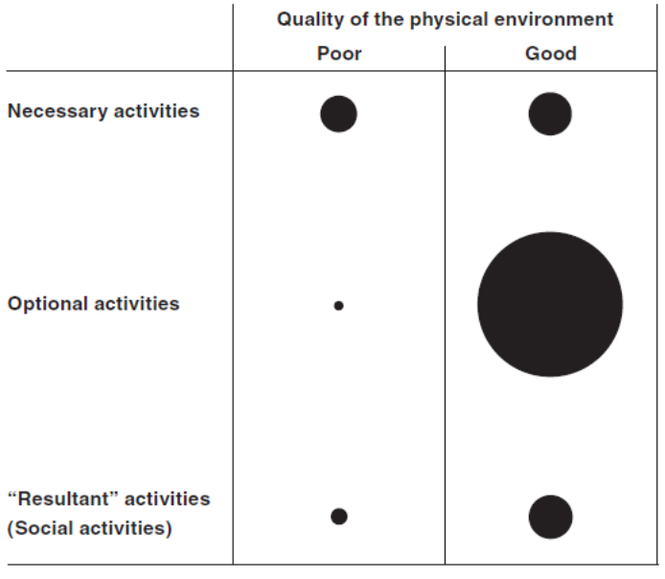


Figure 60 : Quality of physical environment in Philippi – *Google street view*

Gehl (2011), further stresses the importance of quality streets and shared urban spaces and how it enhances the activity of people engaging and interacting with each other. In opposed to people rushing home from work or school, due to poor quality.

All observation made to most if not all public space, turn their back towards the streetscape (figure 60). Making public space less attractive and inaccessible to people's engagement. As a result, this leaves no street interaction and activities, due to poor street conditions.



Graphic representation of the relationship between the quality of outdoor spaces and the rate of occurrence of outdoor activities.

When the quality of outdoor areas is good, optional activities occur with increasing frequency. Furthermore, as levels of optional activity rise, the number of social activities usually increases substantially.

- Gehl

Figure 61: Quality of spaces- Gehl (2011) ----

3.4.5. Conclusion of TOD analysis



Figure 62: Informal settlement developing next to Philippi train station *(north side)*

The area's infrastructure and facilities surrounding Philippi trains station are fragmented making it a poorly connected neighborhood.

Compactness/ Connection

- Collaboration does not exist, facilities are fragmented.

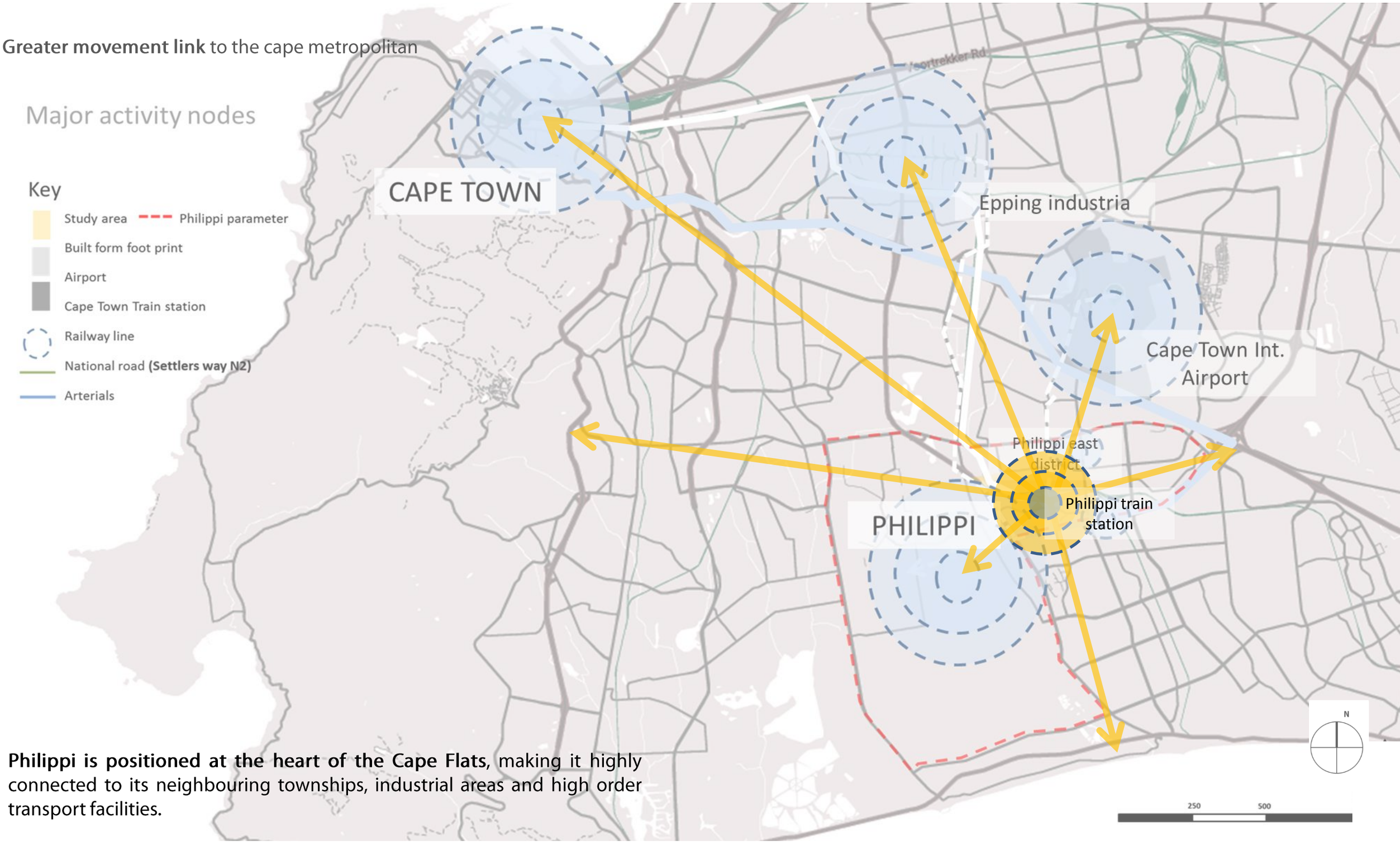
basic needs within their households becomes **a challenge** with regards **to affordability.**

Conclusion

Based on the site analysis one can see that three out of eight TOD principal (namely; mix uses, walkability and transit) are present at in a small quantity. However, these three elements can be used as activator points to build towards a more integrated space, which will sustain a healthy incremental growth that compliments urbanization (Hillier, 2009).

3.5. Opportunities

Greater movement link to the cape metropolitan



Philippi is positioned at the heart of the Cape Flats, making it highly connected to its neighbouring townships, industrial areas and high order transport facilities.

Figure 63: Greater movement link to the cape metropolitan

Greater movement link to with other train stations & other major connectors

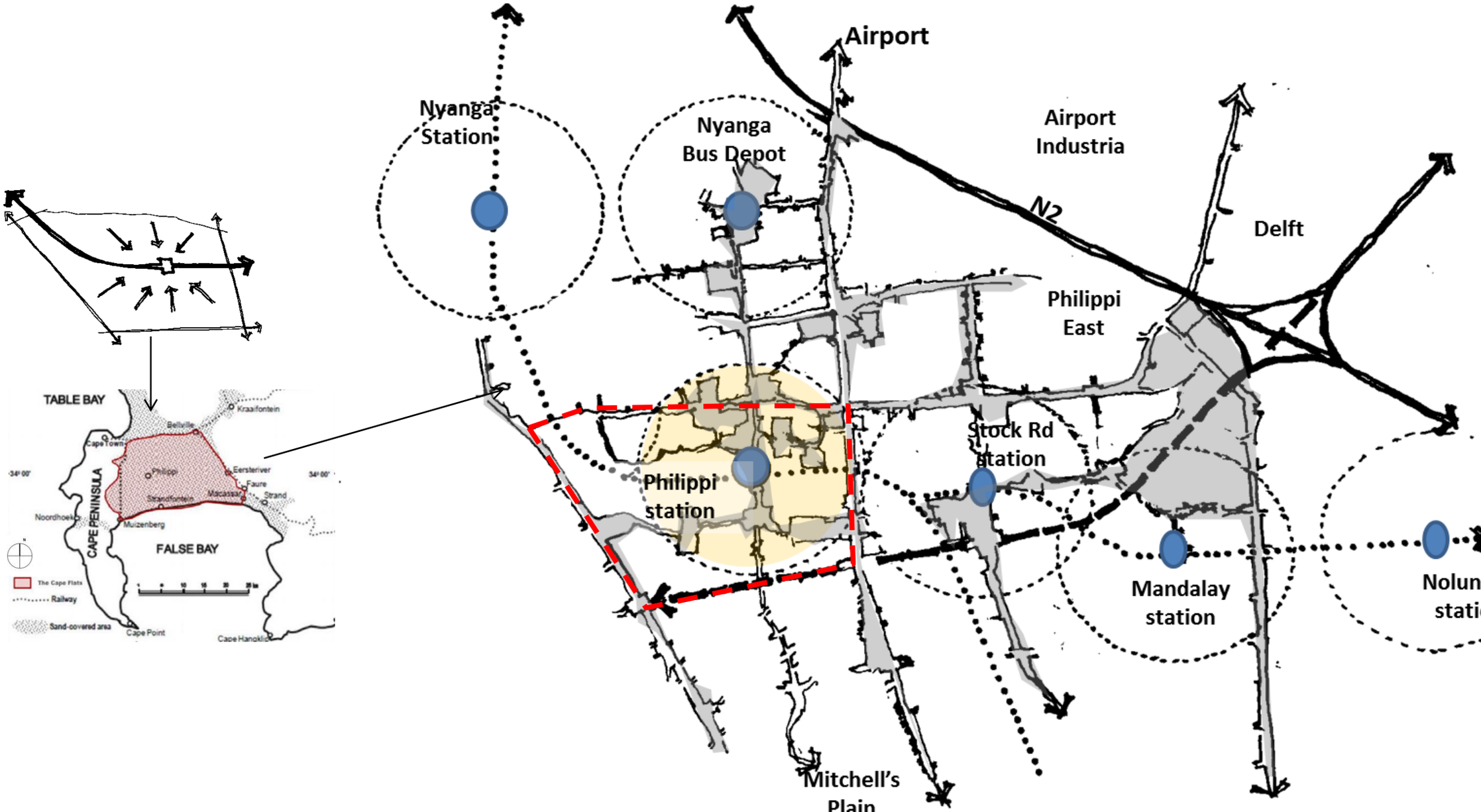


Figure 64: Inward pressure of transport links

As a result of being positioned at the center Philippi constantly experiences an **inward pressure** (figure 64) when regarding, the **socio-economic status, housing, quality of public spaces, basic infrastructure including water and sanitation.**

3.6. Opportunities and Constrains

Land-uses, movement and links to public open spaces

A summary of the findings of opportunities and constrains mapping exercise:

- **Large areas of informal settlements** - Any development should densify in terms of built form.
- **Train station** – can be redeveloped to create a better integrated transit system.
- Informal settlements on **old depot lines** -should be redeveloped into a more compact node to compliment the transit system.
- **Agricultural practice** – should be promoted on selected open spaces and open wetlands alongside railway line.
- **Educational facilities** - to be maintained and used as active node catalyst.

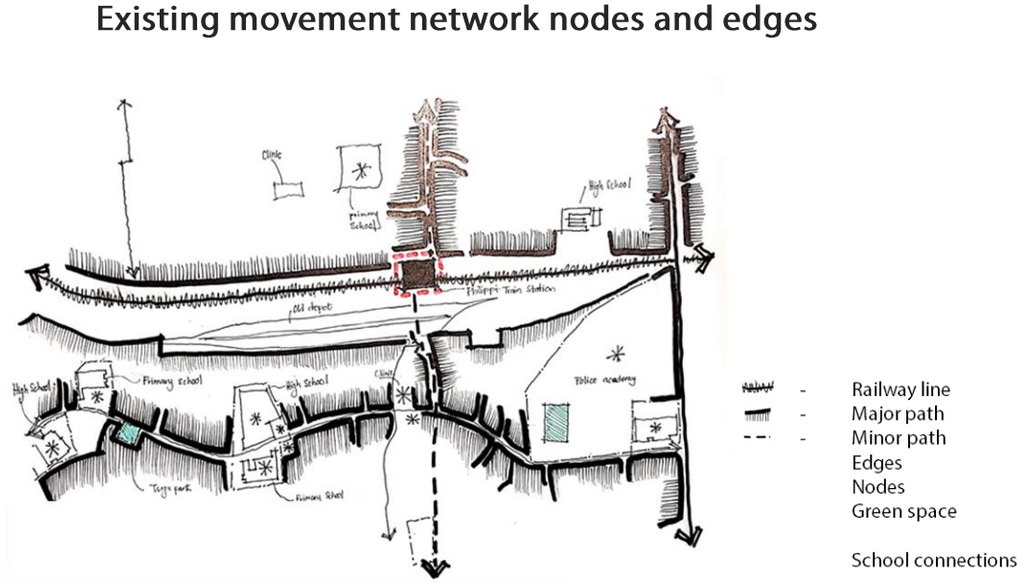
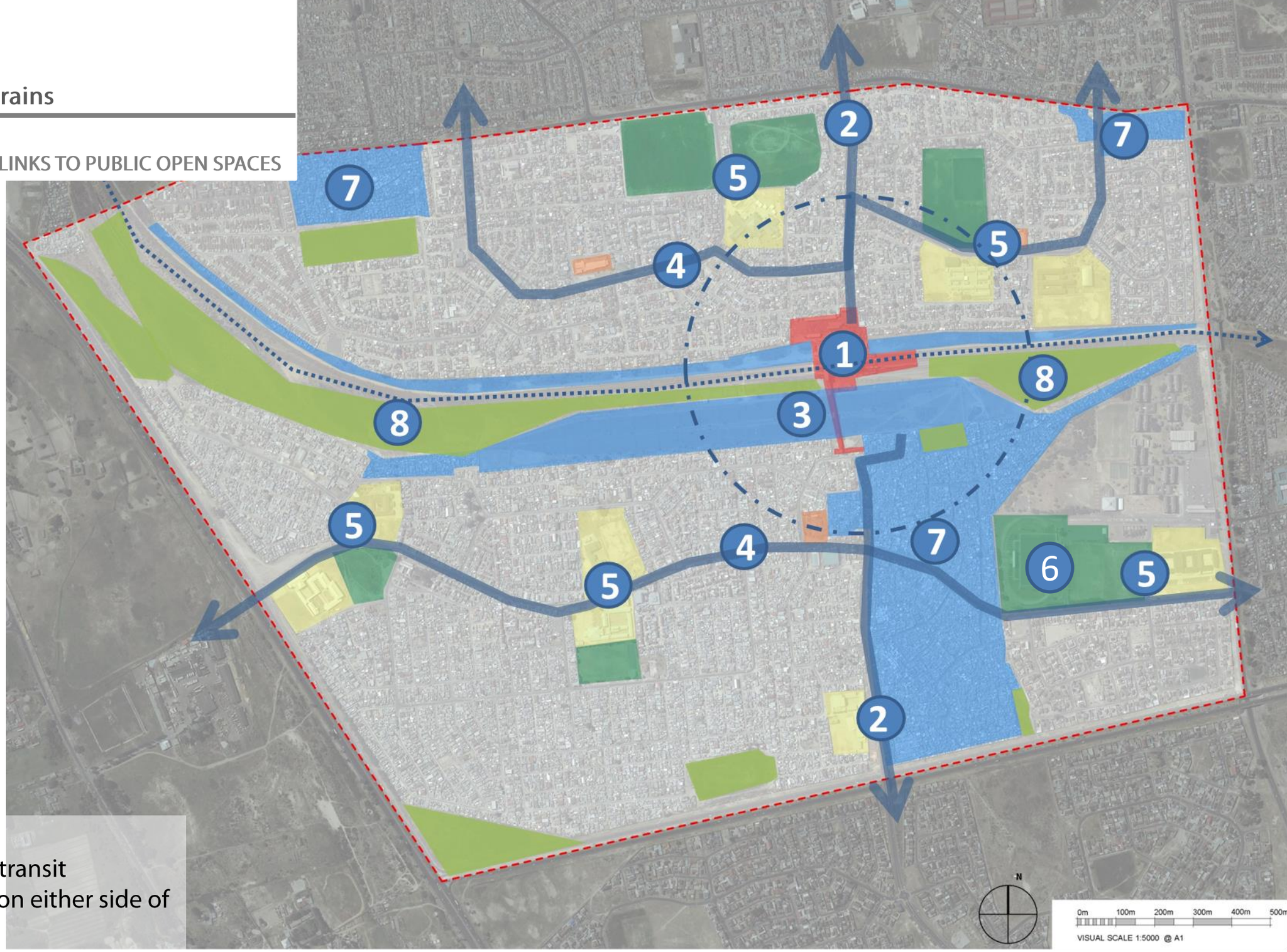


Figure 65: A summary of the findings of opportunities and constrains

Opportunities and Constrains

LAND-USES, MOVEMENT AND LINKS TO PUBLIC OPEN SPACES



KEY

1. Train station as main transit
2. Connector spin road on either side of the station
3. Old depot railway
4. Activity roads
5. Primary, high school, ECD and open space
6. Sports facility
7. Informal settlement
8. Open wetland

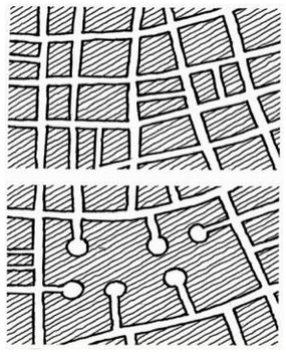
Figure 66: Points of opportunities and constrains

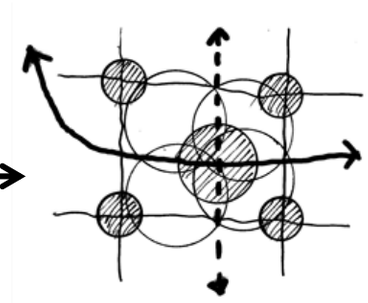
Chapter 4: Neighborhood sprawl repair toolkit

4. Conceptual framework

Principles + theory = urban framework

3 Proposals





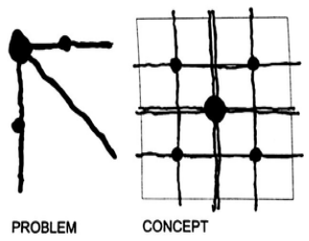


Movement - Tachieva (2010) & Dewar

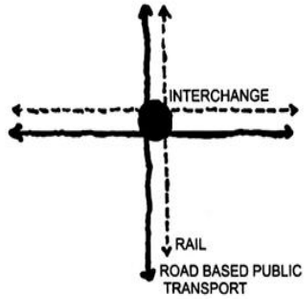
Incremental activity nodes & Gateways – (Dewar,2006)

Green public open spaces – (Gehl & Lynch)

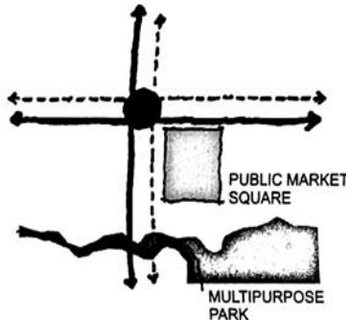
6 Principles (Dewar,2006)



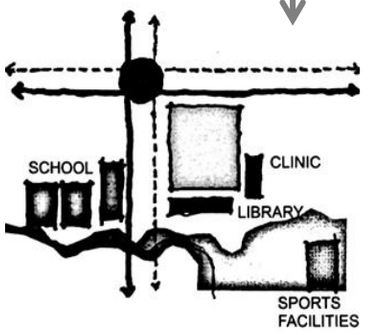
1. Notional hierarchy



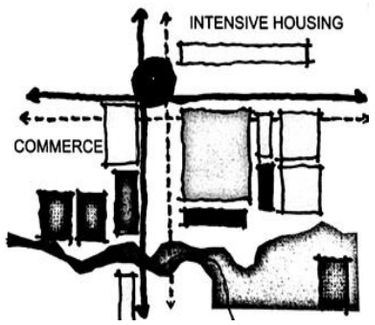
2. Interchange



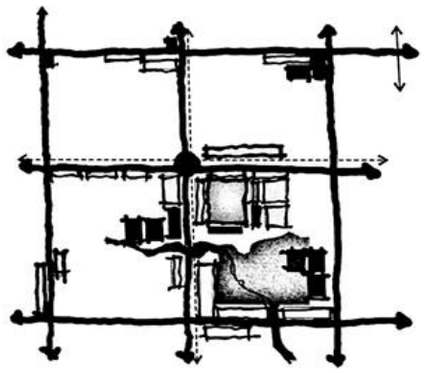
3. People's place



4. Kit of Public parts



5. Centre- Private response



6. Renewal

4.1. Neighborhood repair toolkit

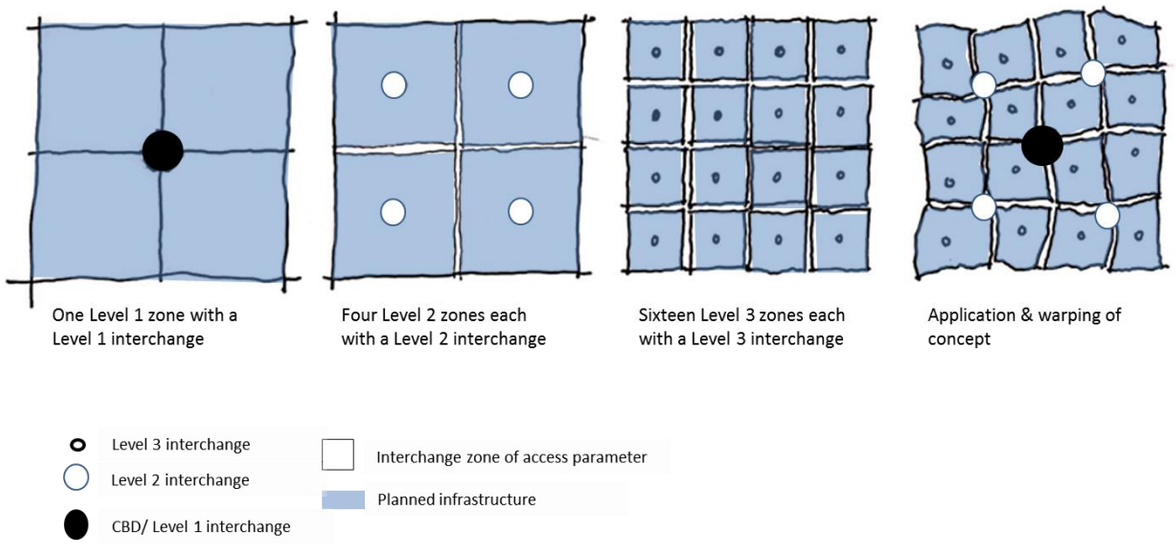


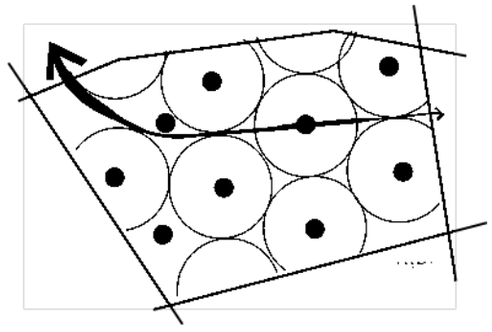
Figure 67: Neighborhood repair – Dewar 2002

Taking into consideration Dewar's approach to designing a settlement for social change (figure 66). Whereby, a compact living is initiated, mixed use of land is considered as a socio-economic force. An equal distribution of services delivered to a greater context which encourages sustainable environments.

Furthermore, the selected precinct is situated at the center of Browns Farm with Ingulube road running on the upper north side and the lower south side of the train station.

Dewar's approach will guide in:

- Creating nodes within the greater Browns perimeter.
- Creating active nodes in the forms of Public Squares and Public Centre's that serve the community.
- Densifying the activity nodes with housing, and areas that facilitate training and commercial activities.
- Positioning activity nodes within 8-10minute walking distance will encourage walking



Nodal points

4.2.1. Repair at a community scale

In reflection to 2.3.3. Formalised informality within the township in the literature review, Philippi is one of the largest townships in the Cape Metropolitan, that has a potential to develop into a sustainable community that includes commercial actives (predominately the thriving informal sector), create more and main current employment.

Following the sprawl repair method by Tachieva (2010), repairing the neighbourhood at a community scale can assist with redeveloping and densifying the train station and an creating an integrated public transport system can help bring about a more integrated incremental neighbourhood (figure 68).



Figure 68 :Repair at a Community scale by Tachieva (2010).

1. New square
2. Green
3. Main spine
4. New connection
5. Arterial repaired as boulevard

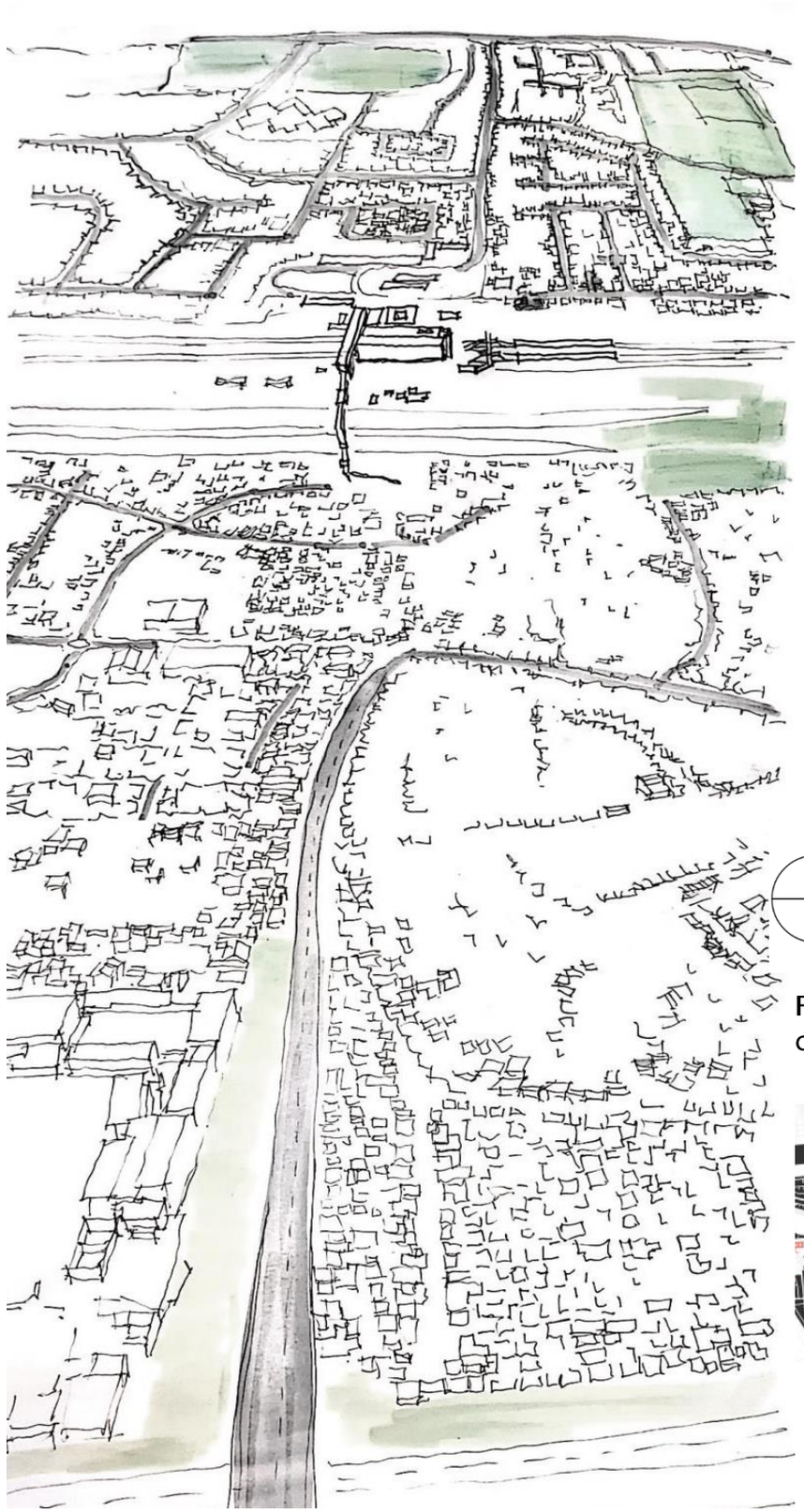
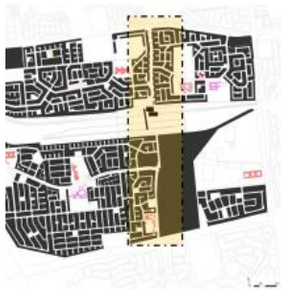


Figure 69: Existing community overview



4.2.3. Developing a main spine

This can be done by creating a new spine that cuts through the community with the train station at the center. This spine (figure 72)will be considered the main boulevard street that links other new smaller street networks from the internal residential parts of the neighbourhood. To bring about a balance of healthy spaces, adequate green spaces should be positioned in pockets of the community and other high level street networks, where people appear to be most present (Tachieva , 2010).

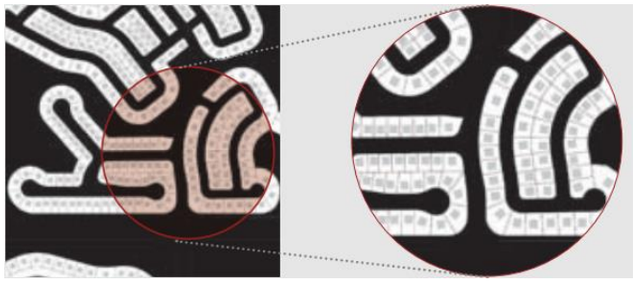


Figure 70: Opening up residential dead-ends to thoroughfares. by Tachieva (2010).

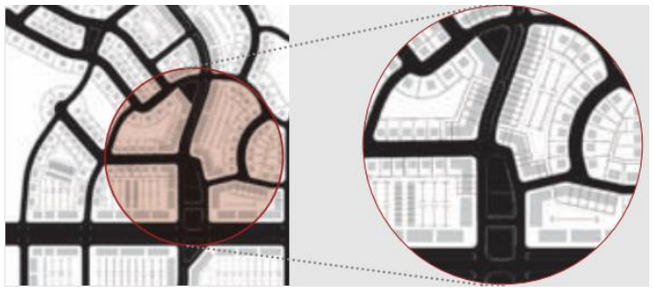


Figure 71 : Connecting thoroughfares. To main spin by Tachieva (2010).

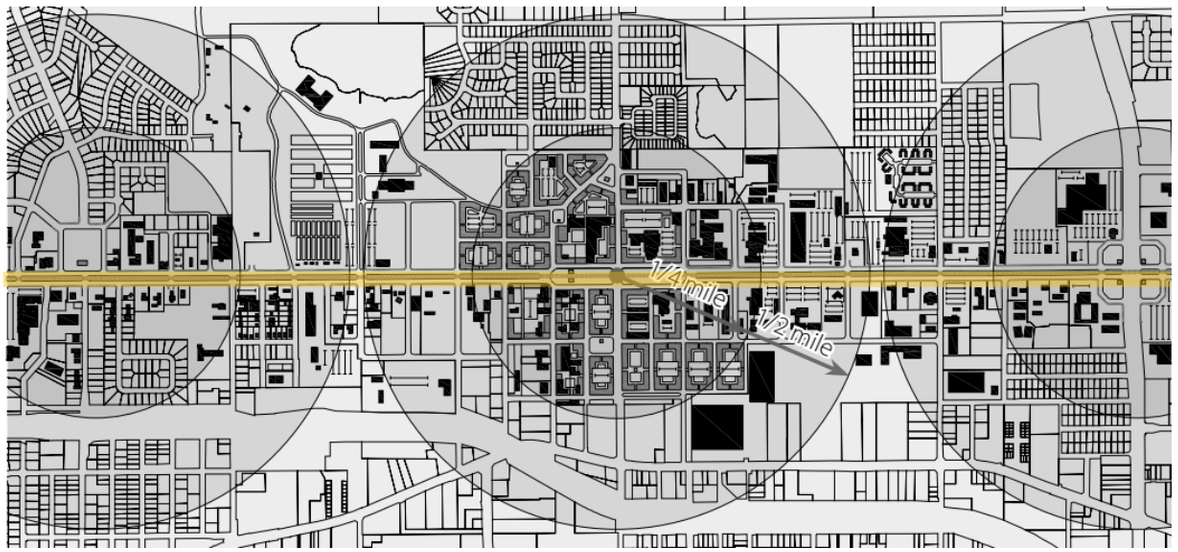


Figure 72 : Interventions along main spine, with smaller nodes set apart in walking distance by Tachieva (2010).

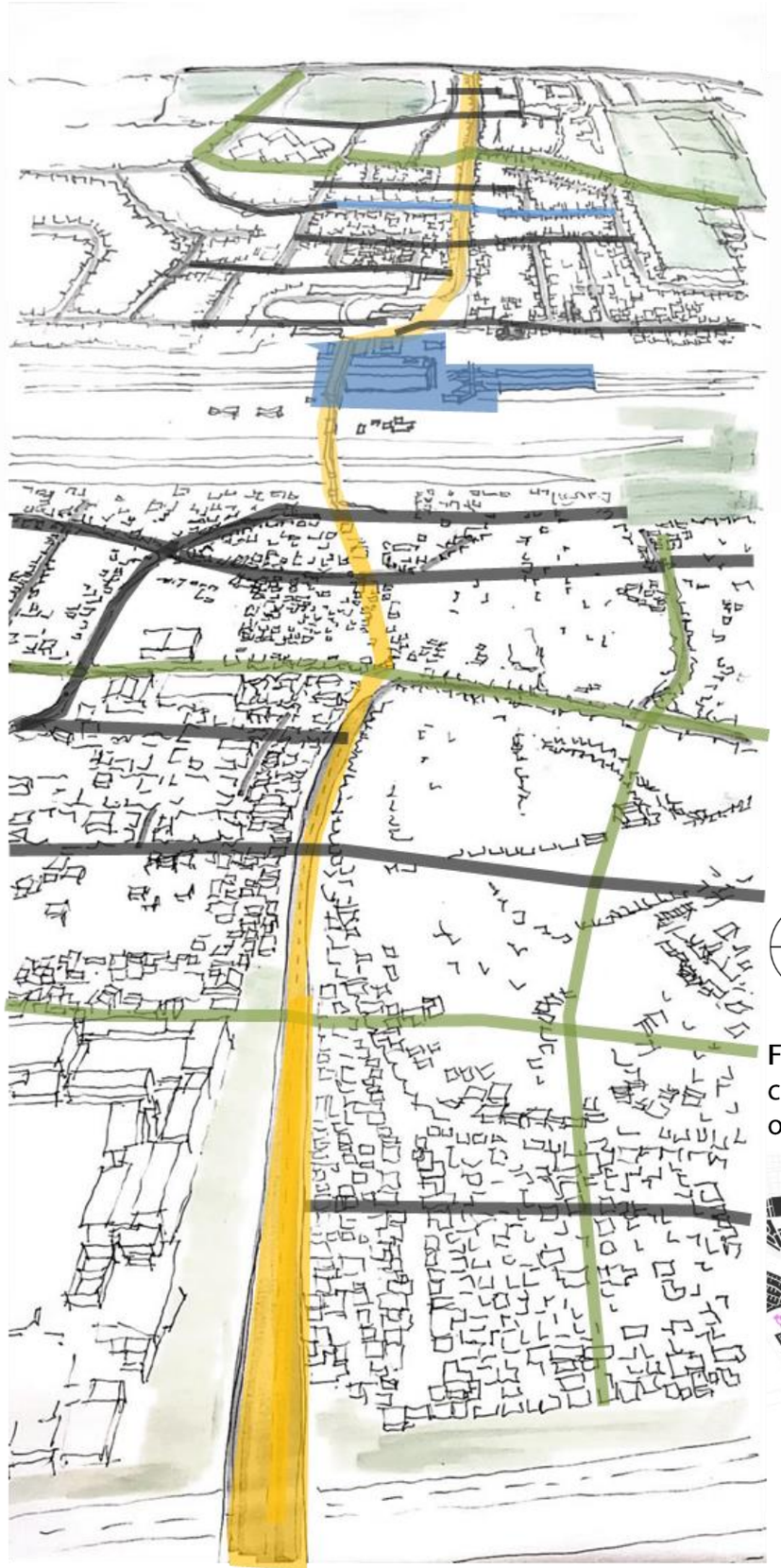
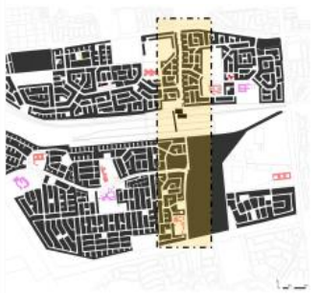


Figure 73: New connected community overview



4.2.3. Informal trade expressed on main spine

As an addition to facilitating a healthy sustainable community, methods used by 26'10 south Architects on the **Diepsloot's Reception Area** (figure 74) located 40km north of Johannesburg's city Centre, can be used as a possible application to portions of the main spine.



Figure 74: Existing built form -by 26'10 south Architects



Figure 75: Reception Area's activity strip - by 26'10 south Architects



Figure 76: Informal trading on Reception Area's activity strip - by 26'10 south Architects

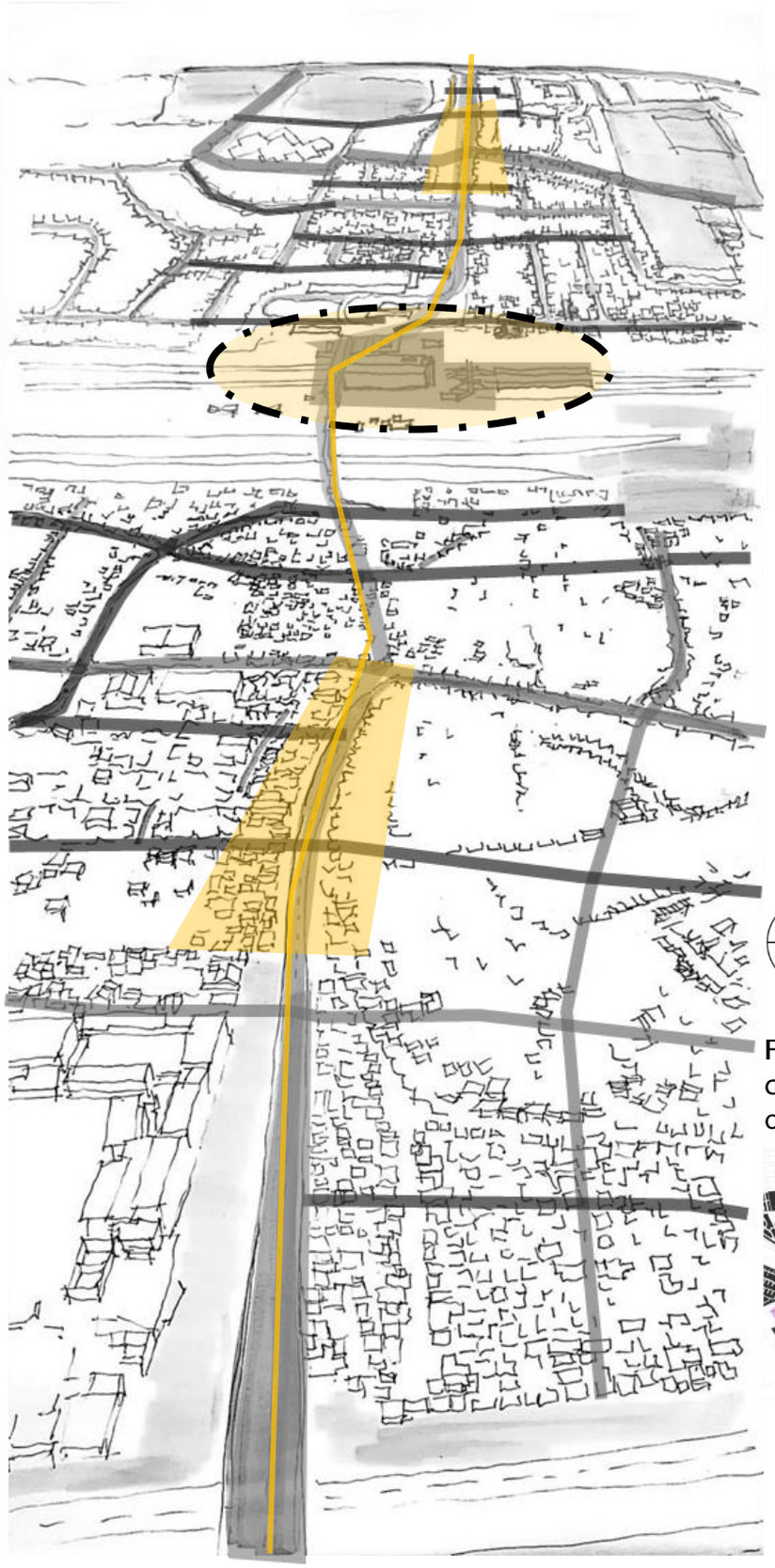
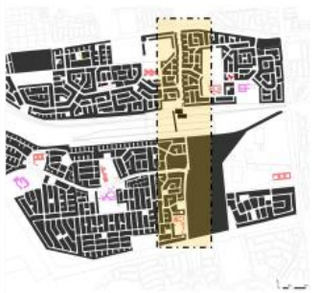


Figure 77: New connected community overview



4.3.1. Formalizing different types of social housing typologies

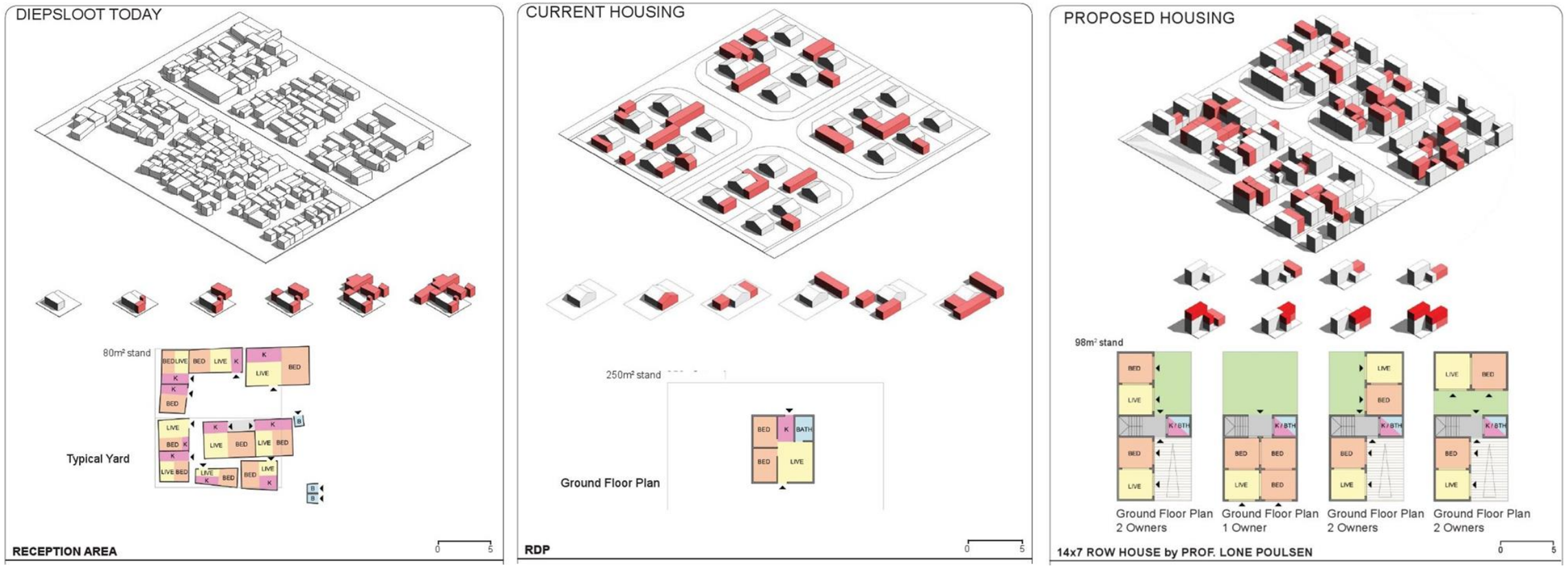


Figure 78: Housing typologies - - by 26'10 south Architects

Philippi and Diepsloot's Reception Area both have a similar context with similar a similar amount of challenges.

Diepsloot's Reception Area addresses the following:

- Developing alternative strategies which respond to and learn from the dynamics of the Informal City.
- Existing density at 300 units/ha (predominantly one storey)

Challenges

- Housing
- Service delivery and effective local governance.

Challenges addressed

- Housing density
- Occupation density
- Built form
- Customizations: rental rooms and small businesses
- Definition of communal and public spaces

Design proposal

- Quality of spaces and diversity of functions point to the potential for low rise, high-density solutions which may be freehold and offer opportunities for sub-letting and small scale enterprise.

- A busy street
- used to compare different formal housing approaches measured in terms of additional accommodation

4.3.2. Formalizing different types of housing typologies

Similar to Diepsloot's Reception Area, different densification typologies can be developed on portions surrounding the train station precinct.

Some existing formal housing typology (figure 79-80) can be subdivided and redevelopment, into a higher density infill, which can stand as a source of income for the property owner, whereby they can sub-let and carry-through small scale businesses.

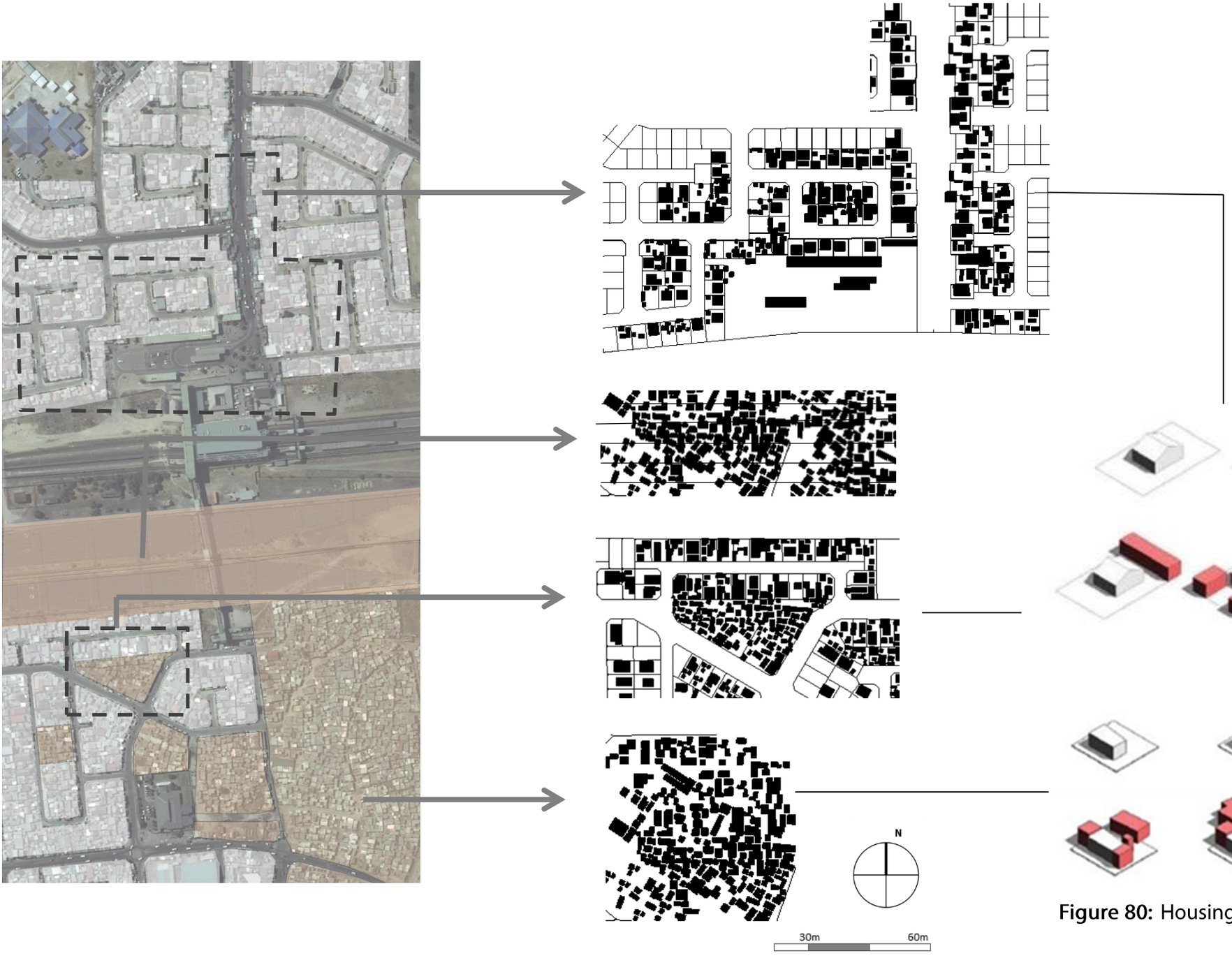


Figure 79: Existing house typologies

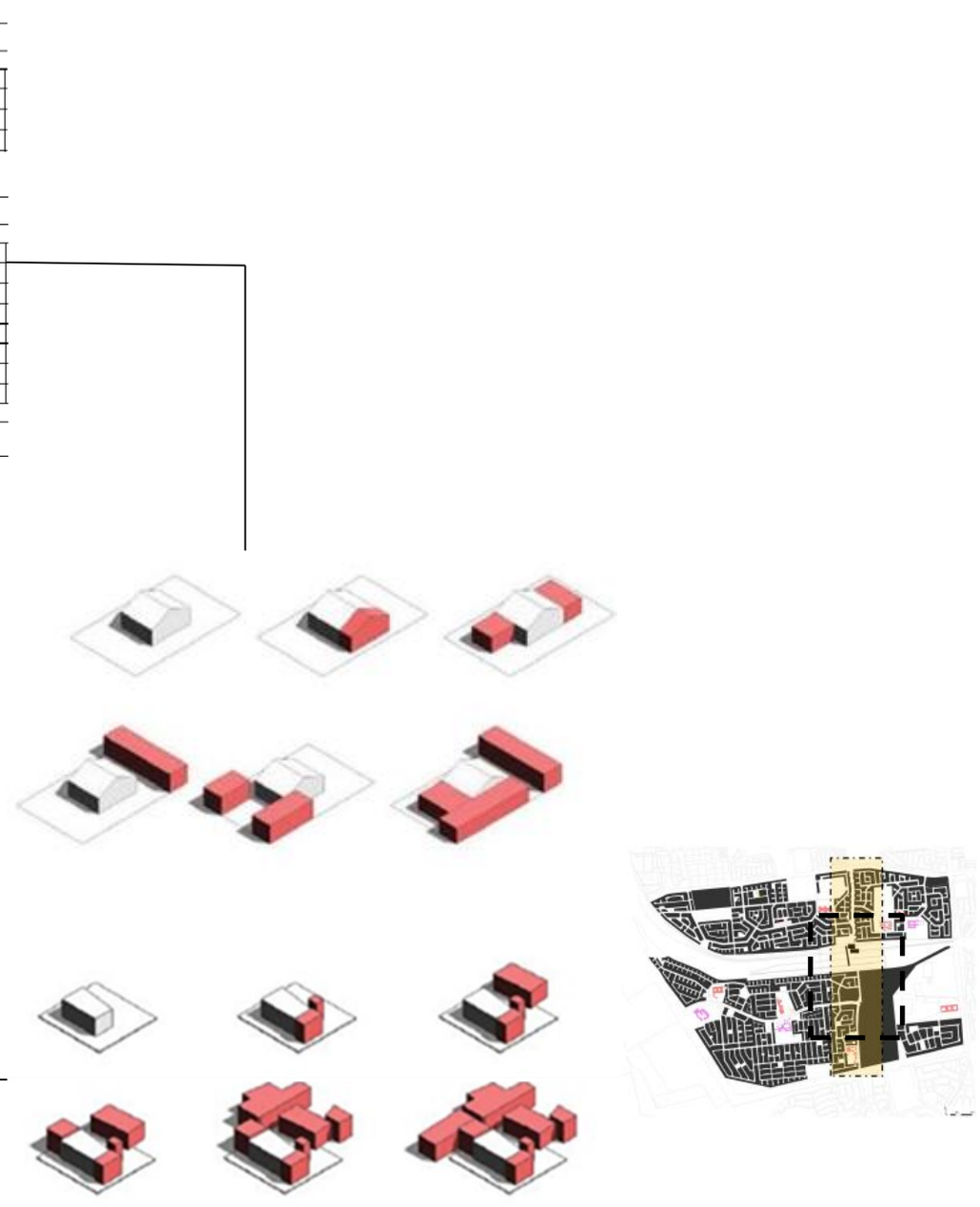


Figure 80: Housing typologies - - by 26'10 south Architects

4.3.3. Formalizing different types of housing typologies

The aim is to propose for a removal of the old railway depot line (figure 81), to enable higher densification, and to further create an incremental intensifying civic node

The civic node can enable a transition between the higher density and the existing low density residential houses.



Figure 81 : Existing house typologies

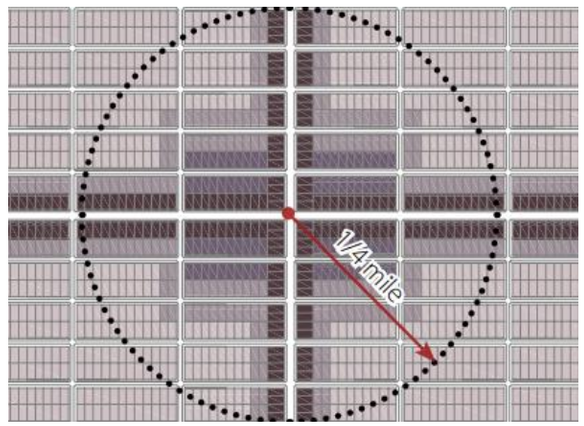
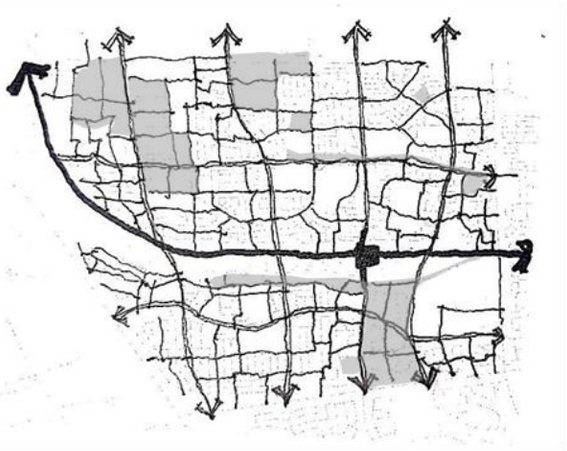




Figure 82: Transition between the higher density and low density residential houses on a nodal point - by Tachieva (2010).

4.4.Place making

Using existing land-use to create a more incremental and sustainable neighborhood as a design element.



RESTRUCTURING AREAS

- Housing
- Public open spaces
- Streetscapes
- Connected transit

- *Transport 2 : Public Road and Public Parking*



PUBLIC FACILITIES

- Open space
- Community centres
- Community 1:
- PRIMARY USES *Place of instruction, Place of worship, Clinic, Rooftop base telecommunication station, Open space.*
- CONSENT USES I*nstitution, Hospital, Place of assembly , Cemetery , Freestanding base telecommunication station, Urban agriculture.*



CONNECTION BETWEEN SPACES

- Collaboration throughout the super blocks
- This would makes spaces more connected, with everything close to each other.



COMPOSITE

Figure 83: Incremental and sustainable neighbourhood

Not to scale: diagrammatic representation

Play parks, sports grounds and facilities, agricultural pockets and cemeteries can be restructured as public open spaces. These public open spaces (figure 83c) can incrementally be linked to each other using green walk promenades over time.

These links can be seen as continuous public footpaths alongside pockets of greenery, that are vital to creating an accessible link towards mutual places and destinations. As Gehl, (2011) describes; there are three types of outdoor spaces that are determined by different types of demands that are set upon the physical environment by its occupants. These include: necessary activities, optional activities, and social activities.

In the case of Philippi there is an optimal need for public open spaces that provide optional activities and social activities and an improvement towards necessary activities.

Chapter 5: Conceptual Design Framework

5. Urban Design Framework

The aim is to design a complimentary urban design framework that addresses fragmented spatial challenges, a disjoint of accessible transit system and design quality public open space for people to engage with and perform daily experiences.

Based on analysis, the scale and challenges faced by the chosen study area lead to designing a Destination Connector – which aims to create a link between residential neighborhoods to the greater community's activity centers by using the train station as the main activator node.

This can further be broken down to **activities and centers** that include:

Places of employment

Educational facilities

Commercial centers

Recreational facilities ***(2030 Palette)***

The above approach then leads to a refined design scope that outlines the following:

1.To Expand Philippi train station to enable a sustainable functional community hub— Tachieva

2.To develop a community incubator that facilitates rural-urban migration— Dewar

3.To create active nodes in the forms of public squares and public centre's that serves the people of the community—Gehl & Lynch

4.Propose to remove the old railway depot line to expand the train station's core — Dewar

5.To densify the activity nodes with housing, and areas that facilitate training and commercial activities to help meet the needs of people within the community— Tachieva

6.Position activity nodes within 8-10minute walking distance —PPS

7.Link nodes with green walks and cycle routes to better connect the neighborhoods— Trancik, R.

8.Use land zoned for transport use (land bordering railway lines), as a temporary agricultural training facilities – Teaching and learning area for Horticultural practice— Gehl

9.Create easy thoroughfare links from greater Browns Farm to Philippi Horticulture Area (PHA), to help raise awareness of preserving the PHA— Dewar & Le Corbusier

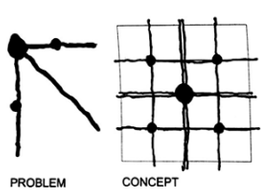
5.1. Philippi train station urban design framework

Principles + THEORY + CONCEPTUAL DESIGN

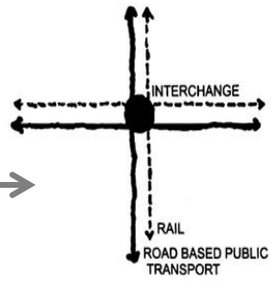
3 Proposals

Movement - Tachieva (2010) → **Incremental activity nodes** & Gateways – (Dewar,2006) → **Green public open spaces** – (Gehl)

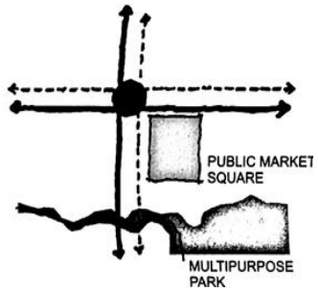
6 Principles (Dewar,2006)



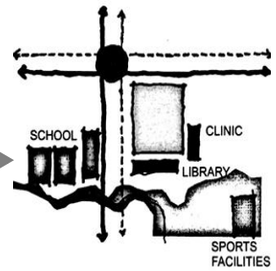
1. Notional hier



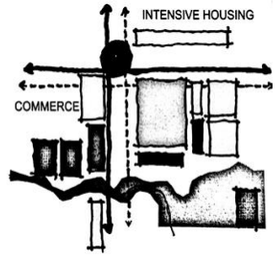
2. Interchange



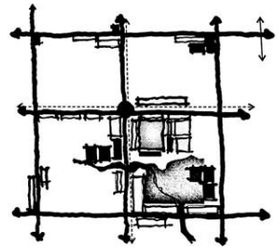
3. People's place



4. Kit of Public parts

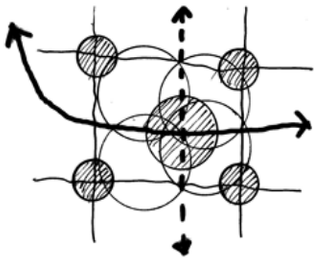


5. Centre- Private response



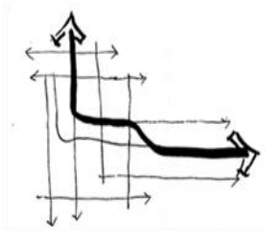
6. Renewal

9 Applications



1. o create active nodes in the forms of public squares and public centre's that serves the people of the community—Gehl & Lynch

2. **To densify the activity nodes with housing, and areas that facilitate training and commercial activities to help meet the needs of people within the community—Tachieva**

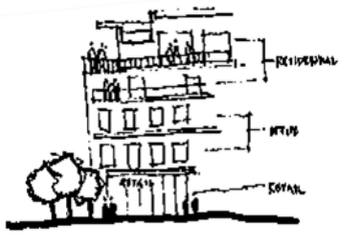


3. Position activity nodes within 8-10minute **walking distance**—PPS

4. **Link nodes** with green walks and cycle routes to better connect the neighborhoods—Trancik, R.

5. **Create easy thoroughfare links from greater Browns Farm to Philippi Horticulture Area** (PHA), to help raise awareness of preserving the PHA— Dewar & Le Corbusier.

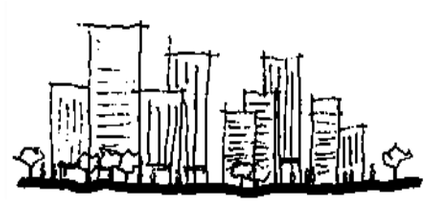




6. Propose to remove the old railway depot line to expand the train station's core and **compact** the land uses — Dewar

7. To develop a **community incubator** that facilitates rural-urban migration—Dewar

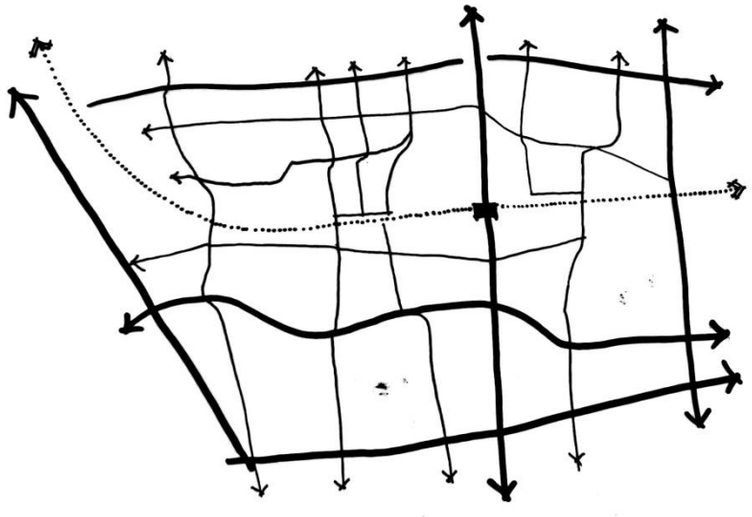
8. Use **land zoned for transport** use (land bordering railway lines), as a temporary agricultural training facilities – Teaching and learning area for Horticultural practice—Gehl



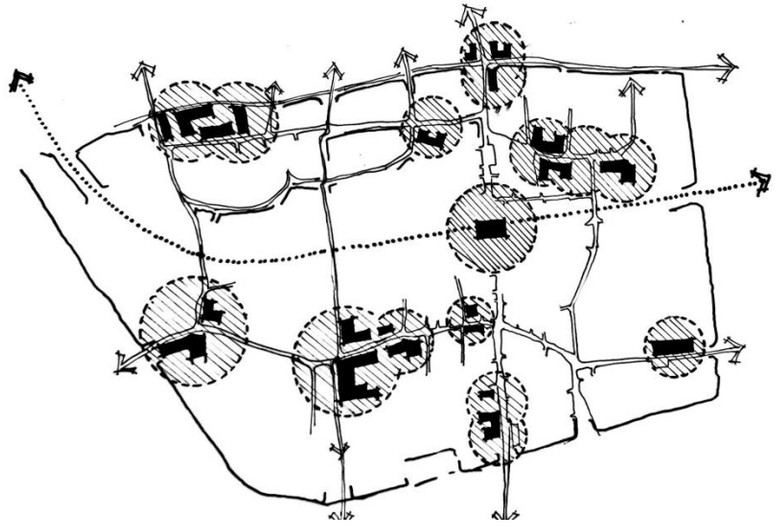
9. To **Intensify** Philippi train station to enable a sustainable functional community hub—Tachieva

5.2. Conceptual development

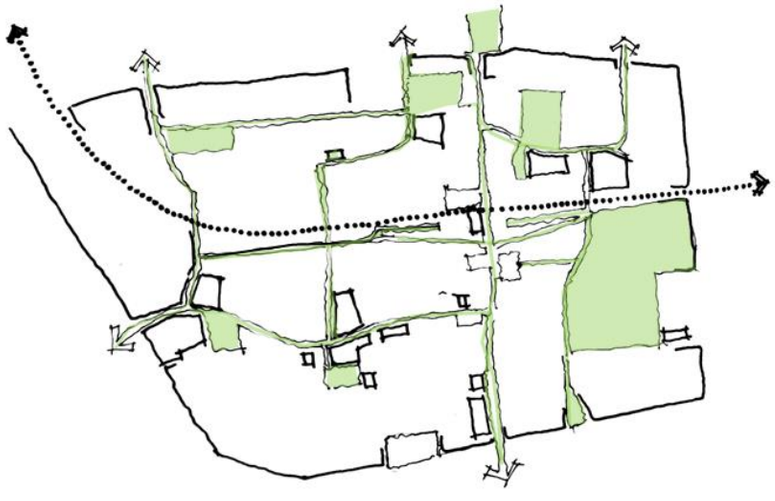
CONCEPTUAL DIAGRAMS : COMMUNITY SCALE RESTRUCTURING USING URBAN DESIGN THEORIES



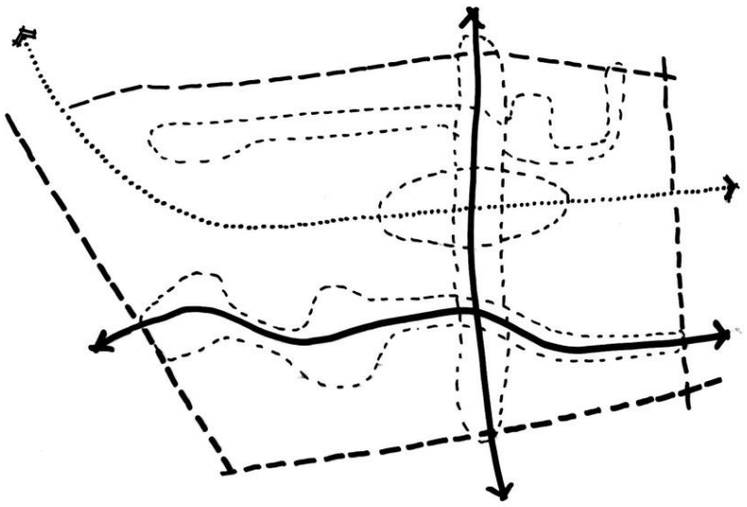
Major **Movement** & Gateways



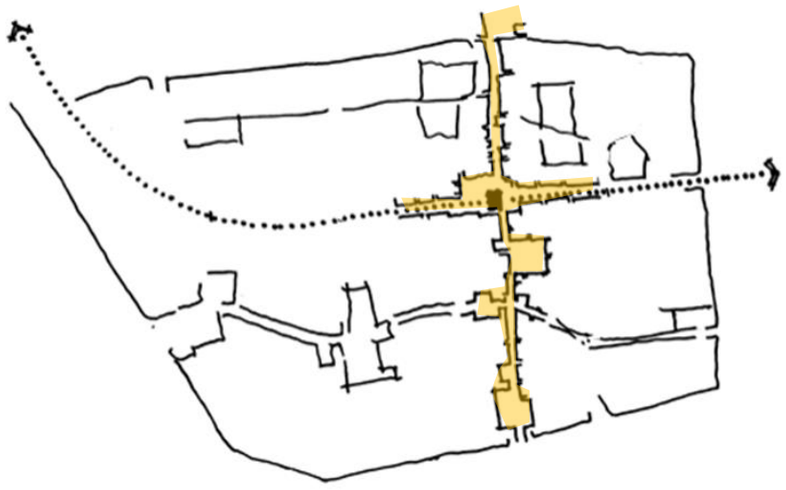
Incremental activity nodes



Green public open spaces



Intensification areas



Edges on civic core

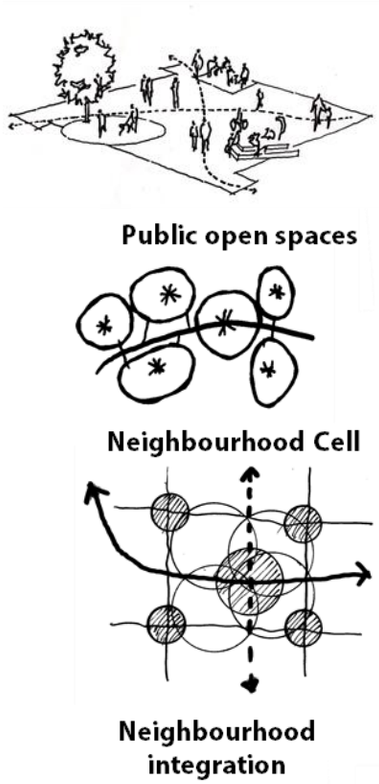


Civic core Precinct

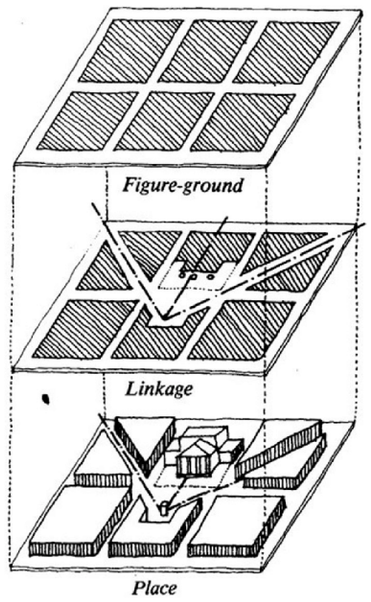
Figure 84: Conceptual diagrams

5.3. Designing spaces for people

QUALITY PUBLIC OPEN SPACE : COMMUNITY SCALE RESTRUCTURING USING URBAN DESIGN THEORIES



- Gehl



- Trancik

Figure 85: Urban Design theories – Trancik, Gehl& – Neighbourhood form archetypes

In reflection of Gehl's theory for quality open spaces, areas surrounding majority of the train station vicinity are poorly connected which often discourages pedestrian movement and human activity. The large amount of low residential built form consists of pockets of poor quality public open space. Which are viewed as unsafe and uncomfortable for people who would wish to utilise the public open space and pedestrians who walk through theses spaces.

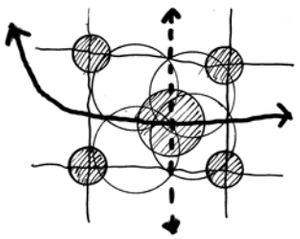
The aim is to use the already existing educational nodes, which flow adjacent to informal trading as possible public areas for people to enjoy. In addition following Gehl (2010) suggestions on designing quality public spaces, he writes that one should develop a list of key quality criteria, in this case using what is existing as a point of departure:

- Create an opportunity for people to see. Creating a space that is free from violence and crime for people's protection.
- Creating a space that is free of vehicular traffic.
- Creating an opportunity to walk/cycle.
- Create a quality public realm, that would be attractive to the eye.
- Create an opportunity for people to sit.

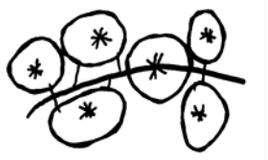
To add on to the list; when putting people first before traffic, integrated land uses and transport systems. What stands out as important is creating an ease of movement, in a site that currently sits with fragmented and scuttered public open spaces. However, promoting accessibility and permeability means creating a place that is easy to get to and move through when moving from one place to another.

Promoting legibility, by providing the user with recognisable movement networks and landmarks often help people find their way around much easier and it also creates a clear image that is easy to understand as time goes on (Detr, 2000)

5.3.1. Precinct development



Neighbourhood integration



Neighbourhood Cell

Figure 86 : Neighbourhood Cell –*Neighbourhood form archetypes*

Using the *Neighbourhood Cell* archetype in conjunction with applying a destination connector (2030 Palette) . Smaller nodes of activity (figure 87) can be developed to enable incremental growth within the neighborhood. These nodes can consist of places of employment. Which can take the form of community hubs and economic hubs. Public open spaces can be established to enhance existing educational facilities and existing informal trading.

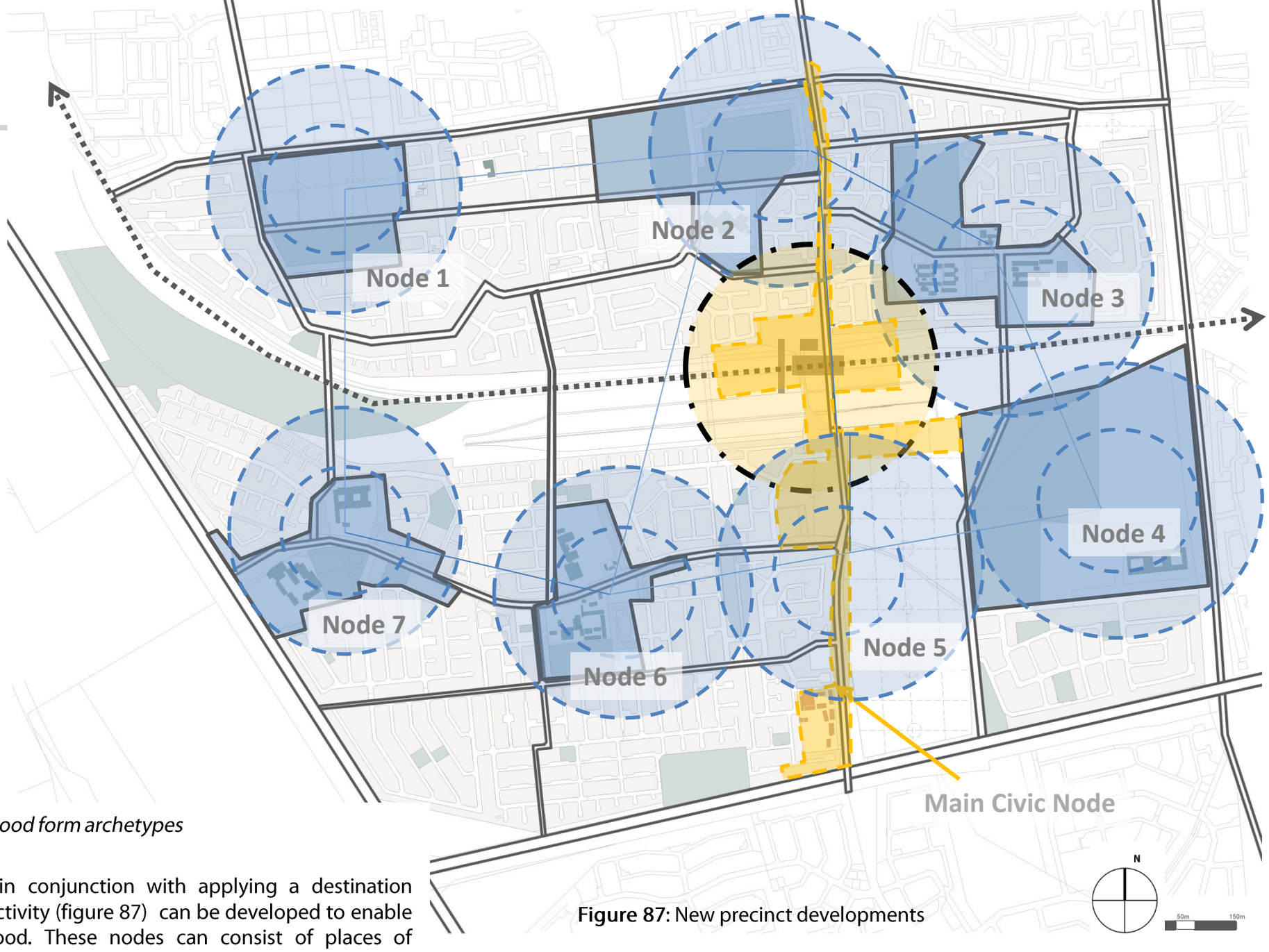


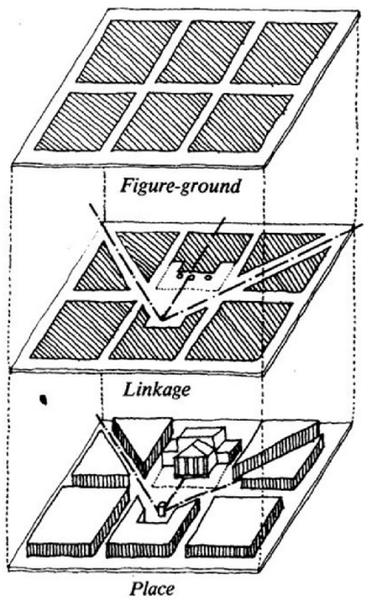
Figure 87: New precinct developments

5.3.2. Public spaces and civic node



- Gehl

Public open spaces



- Trancik

Figure 85: Urban Design theories

Developing a mixed use neighbourhood 'unit' (figure 88) using smaller activity nodes at a pedestrian scale will shorten the distance that people walk from one place to another.

Public open space, in close range of existing schools and other shared community facilities should be evenly spread to enable points of relief, engagement and social activities when people move from one point to another.

Limited vehicle permeability should be present on High streets and node connectors that lead connect to the main civic node that serves the greater need of the community..

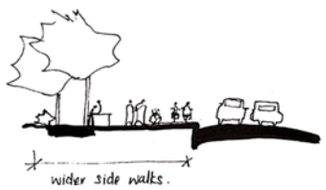


Figure 88: New public spaces

5.3.3. Peoples activities



Walkability



Cycling



Public open spaces

- Gehl

Figure 85: Urban Design theories

Physical expression of place, is strongly influenced by the form of buildings, the spaces formed between the buildings and other structures. A collection of these elements, contributed towards the pattern of uses which in most cases develops through movement, and it is here, where people cultivate and create activity which brings about a character and identity of place.

As mentioned previously with the *Neighbourhood Cell* archetype in conjunction with applying a destination connector. Creating strong connections of movement for people on either side of the railway can promote and achieve successful pockets of human actives within the greater neighbourhood parameter.

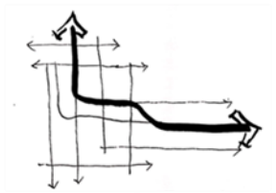
In the case of Browns farm it is along the existing shared public facilities that people's activity are already creating causing a nucleus of experience and human interaction (figure 89), that is highly influenced by how and where people move towards.

Being that majority of the people who live in Browns Farm, are pedestrians, it is highly important to draw more attention on how pedestrians move from one side of the railway line to the other, in order to get to their destination.



Figure 89: Intensified people's activities.

5.3.4. Movement and transit connections



Connections



Transit

The integrated public transport system, includes; integrating passenger rail, Golden arrow and My Citi (BRT) buses, local and long distance minibus taxis. Which are already part of an integrated transit plan for the City of Cape Town. In addition non-motorised transit (NMT) in surrounding areas will be encouraged in areas near public open spaces and other shared facilities.

This integrated transport system (figure 90) can form part of the greater spatial development framework (SDF) and other local plans that still need to take form. As an idea for core transport corridors, the North side road that leads to the train station can become a corridor that links the train station to the Airport.

Strategically placing bus stops on the outer sides of the neighbourhood's parameter will enable creating limited vehicle permeability on the internal side of the neighbourhood's parameter.

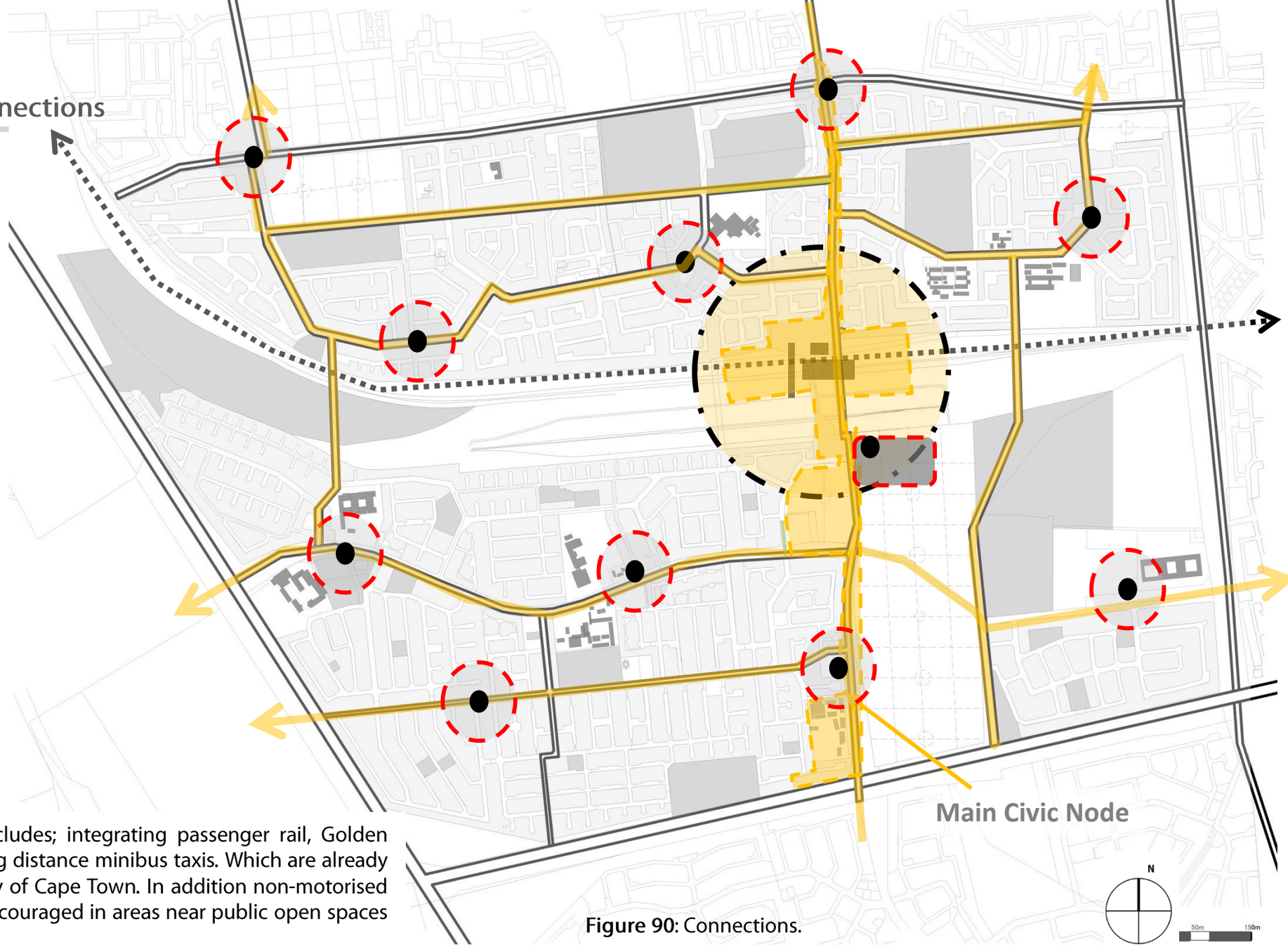


Figure 90: Connections.

5.3.5. Precinct conceptual design overview

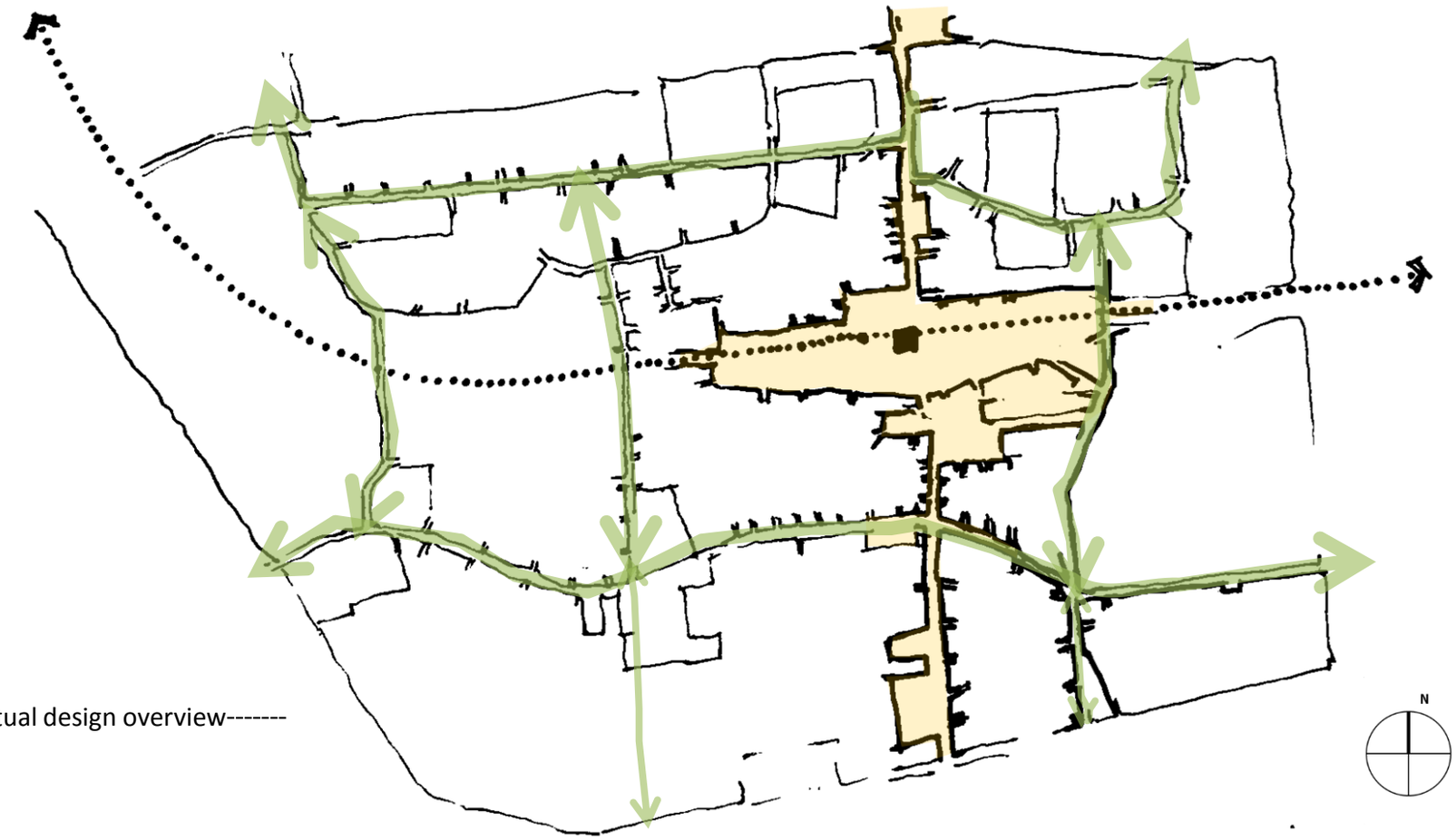


Figure 91: Study area Conceptual design overview-------

The train station node is 800mm in diameter. Aimed to intentionally develop the node as TOD. The node is within walking distance of a transit station that includes a rail, bus, short and long distance taxi services (Lund,et al. 2004)

The adjacent nodes are all just under a kilometre apart; the idea is to make a central nodal point for each diameter, where an activity will take place in order to enable constant movement throughout the different neighbourhoods.

The green arrows act as green promenades which have a high focus in human scale and interaction, making it a route with minimal vehicular traffic.

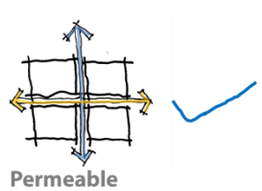
This route also leads to the train station. Also linking the overall Browns Farm to the Philippi Horticulture Area (PHA), this is strategically linked with the aims to bring about an awareness of the treat that the PHA faces with regards to land conversion (for housing development), the impact it will have in Food productions and economic effect for the greater Cape Town.

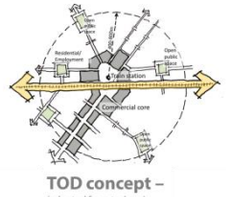
The three key interventions *(movement, incrementalism and pubic open spaces*) (Figure 91) aim to create a more inclusive precinct that will be people friendly. The permeable streets will encourage walkability and inclusive activities between people and places.

The overall interventions are scaffolded by six principles that are adapted from Dewar(2006) followed by nine applications that are specific to the site and its parameters. In perspective with the nine applications, other principles such as transit oriented development, place making, and incrementalism will aid in designing for people and help repair the old apartheid layouts of segregation.

In reflection to the first sub question: ***Which urban design elements can one use to facilitate the movement that takes place at the train station and land that surrounds them?***

The application of this design based research follows a thorough breakdown of the urban design proposal applied together with the principles that will be employed to test out the design proposal on Philippi train station with a great emphases on pedestrians, permeability and the TOD concept.

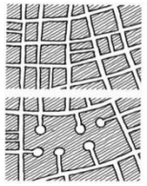




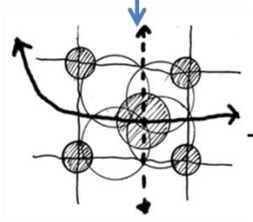
5.4. Application

CONCEPT + DESIGN PRINCIPLES

3 Proposals



Movement –
McGlynn,et al. (1985)
Tachieva (2010) & Dewar

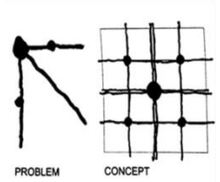


Incremental activity nodes
& Gateways – (Dewar,2006)

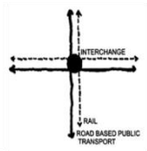


Green public open spaces
– (Gehl & Lynch)

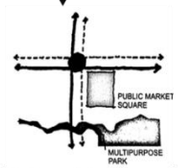
6 Principles
(Dewar,2006)



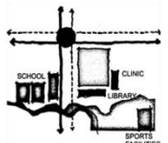
1. Notional hierarchy



2.Interchange



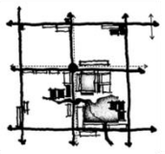
3. People's place



4. Kit of Public parts

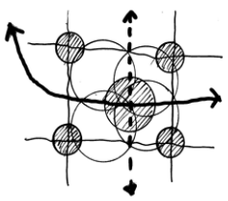


5. Centre- Private response



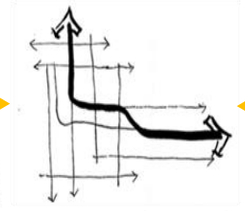
6. Renewal

9 Applications

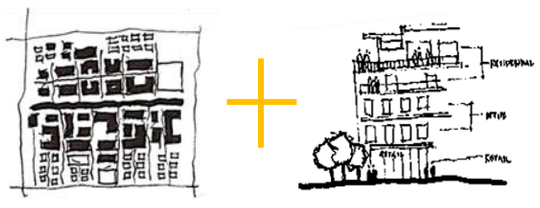


1. o create active nodes in the forms of public squares and public centre's that serves the people of the community—Gehl & Lynch

2. **To densify the activity nodes with housing, and areas that facilitate training and commercial activities to help meet the needs of people within the community—Tachieva**



3. Position activity nodes within 8-10minute **walking distance**—PPS
4. **Link nodes** with green walks and cycle routes to better connect the neighborhoods—Trancik, R.
5. **Create easy thoroughfare links from greater Browns Farm to Philippi Horticulture Area** (PHA), to help raise awareness of preserving the PHA— Dewar & Le Corbusier.



6. Propose to remove the old railway depot line to expand the train station's core and **compact** the land uses — Dewar
7. To develop a **community incubator** that facilitates rural-urban migration— Dewar
8. Use **land zoned for transport** use (land bordering railway lines), as a temporary agricultural training facilities – Teaching and learning area for Horticultural practice—Gehl



9. To **Intensify** Philippi train station to enable a sustainable functional community hub—Tachieva

5.5. Expansion of the train station's core on old railway depot line

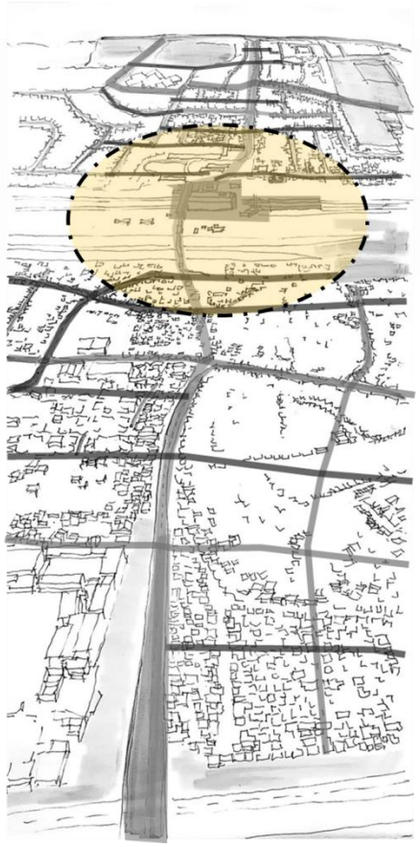
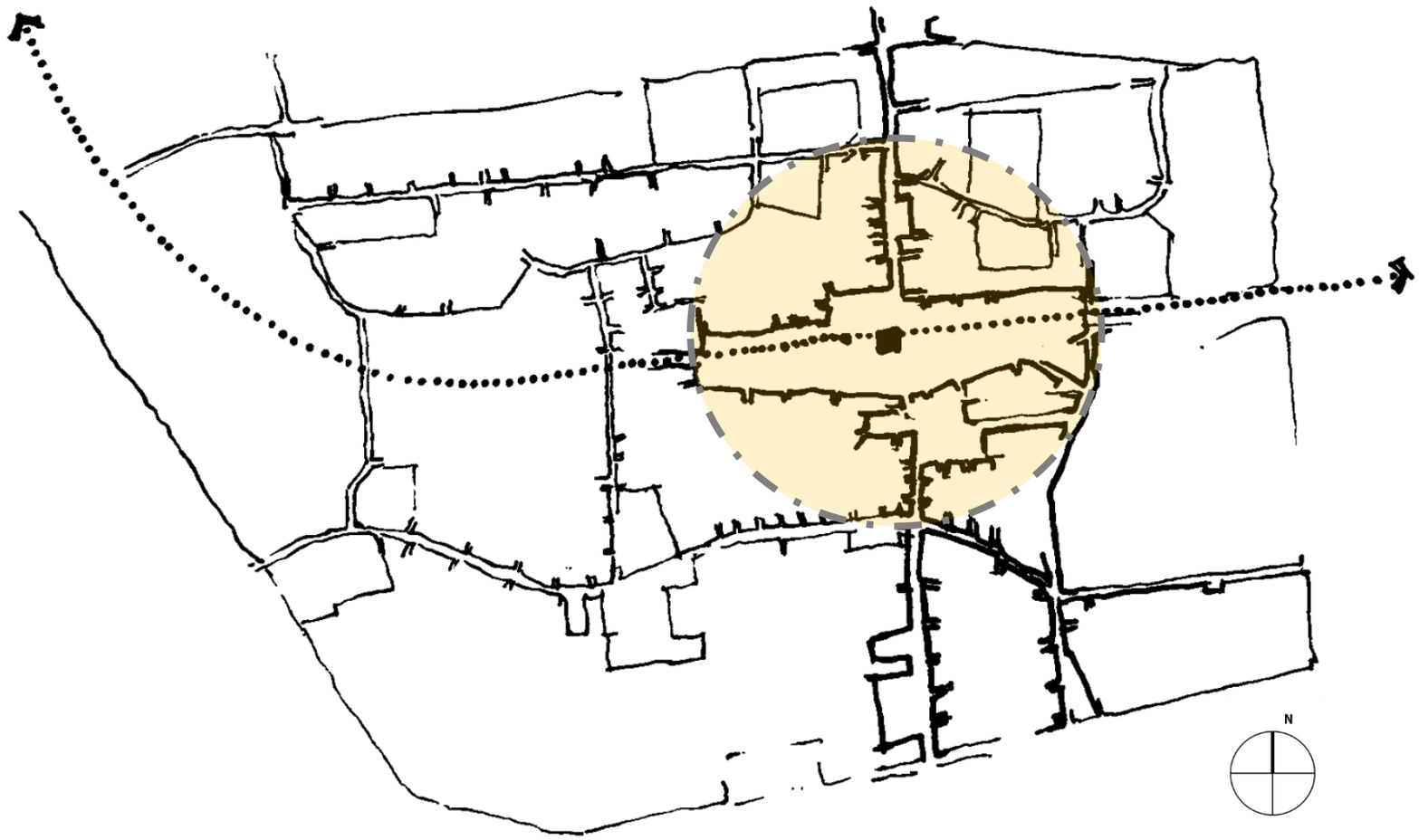


Figure 92 : Precinct parameter

Using Public structure as a way forward for Incrementalism

Daniels,et, al.(2016), Speak about :*Public structure as a starting point for incremental upgrading.* Here they suggest design innovation and social organisation in the public realm as a guide towards transformation within the informal settlement.

This includes the implementation of subsequent management and maintenances post-intervention within the neighbourhood.



Public structure in a 400m radius surrounding train station.

- Using the station as a driving force to create a Civic node for the Philippi Township
- Allow for the people within the community to participate in adding on to the economy by facilitating small scale businesses along green walks and civic node.
- The starting point would opening up the street network to increase thoroughfare movement and increase connectivity
- Integrate new public open spaces within the new street network.
- Use the old railway line to densify the station's core and increase the possibilities of future intensification.
- Create a stronger public transport interchange, with a strong NMT network the will cater for the existing and predicated population of Philippi and other neighbouring communities. Here thoroughfare links connect on either side of the railway line.

Precinct design proposal

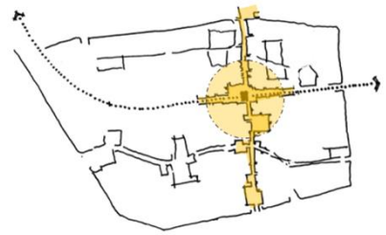
PRECINCT PLAN

400m RADIUS INTERVENTION

Surround train station.

Existing

- Primary School
- High School
- Medical facility
- PRASA Building



0m 40m 80m 120m 160m 200m

VISUAL SCALE 1:2000 @ A1

N

Figure 93: Precinct development plan

5.6.1. Response to design informants: **Movements - people**

PEOPLE'S MOVEMENT (Pedestrians)



Existing movement network

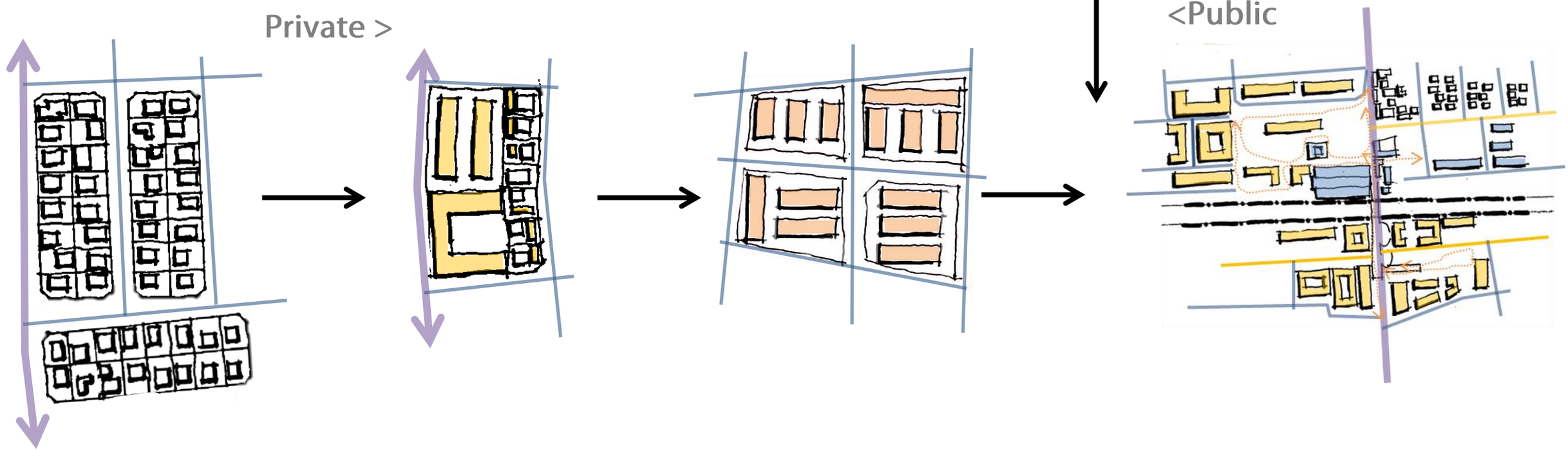
Figure 94: Pedestrian movement

1. **Designing streets for people**

KEY:
- High activity roads
- Medium activity roads
- Low activity roads
- NMT route
- Bicycle loop
- **Pedestrians**

5.6.2. Response to design informants: **Movements - people**

Principles + THEORY : **MORPHOLOGY** SHIFT IN SCALE



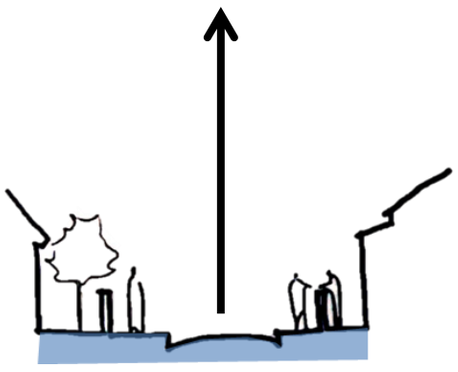
Single residential
Increase permeability

Mixed & Incremental residential

Densified: new neighbourhood

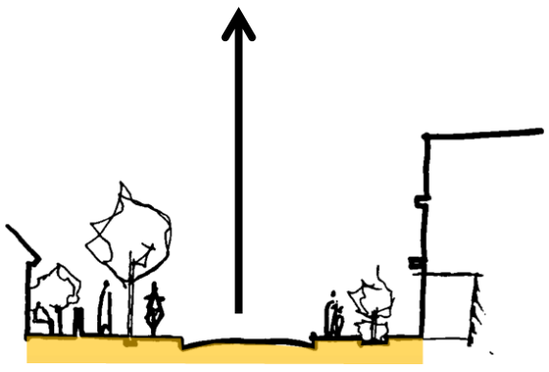
Compacted/Transit: new district

People in relation to street spaces



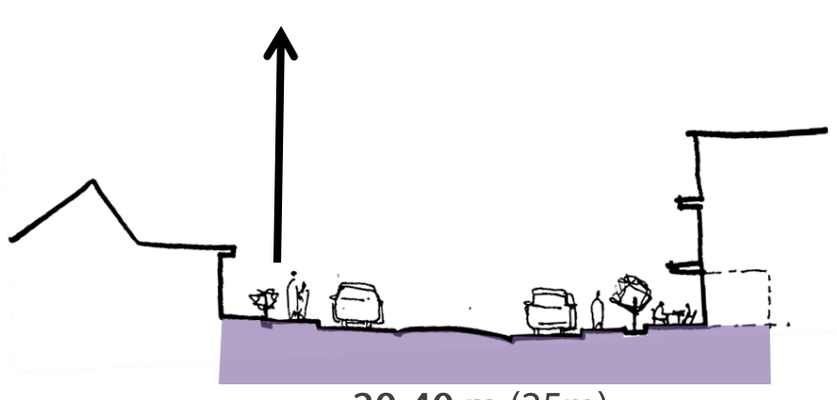
10-16m (14m)

Single residential street



16-30 m (20m)

Residential feeder street **(Neighbourhood street)**



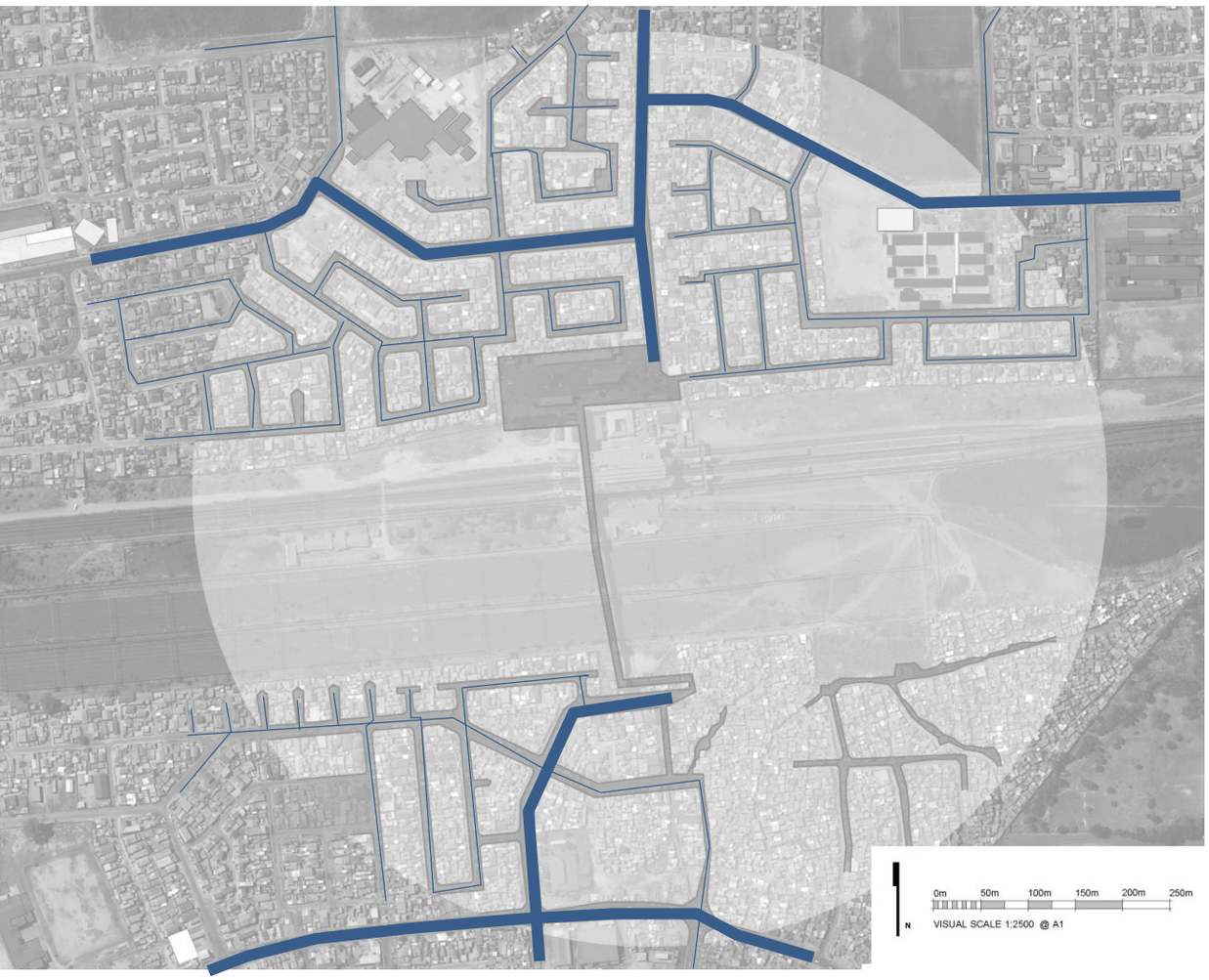
20-40 m (25m)

Boulevard street

Figure 95: Pedestrian vs Vehicular movement

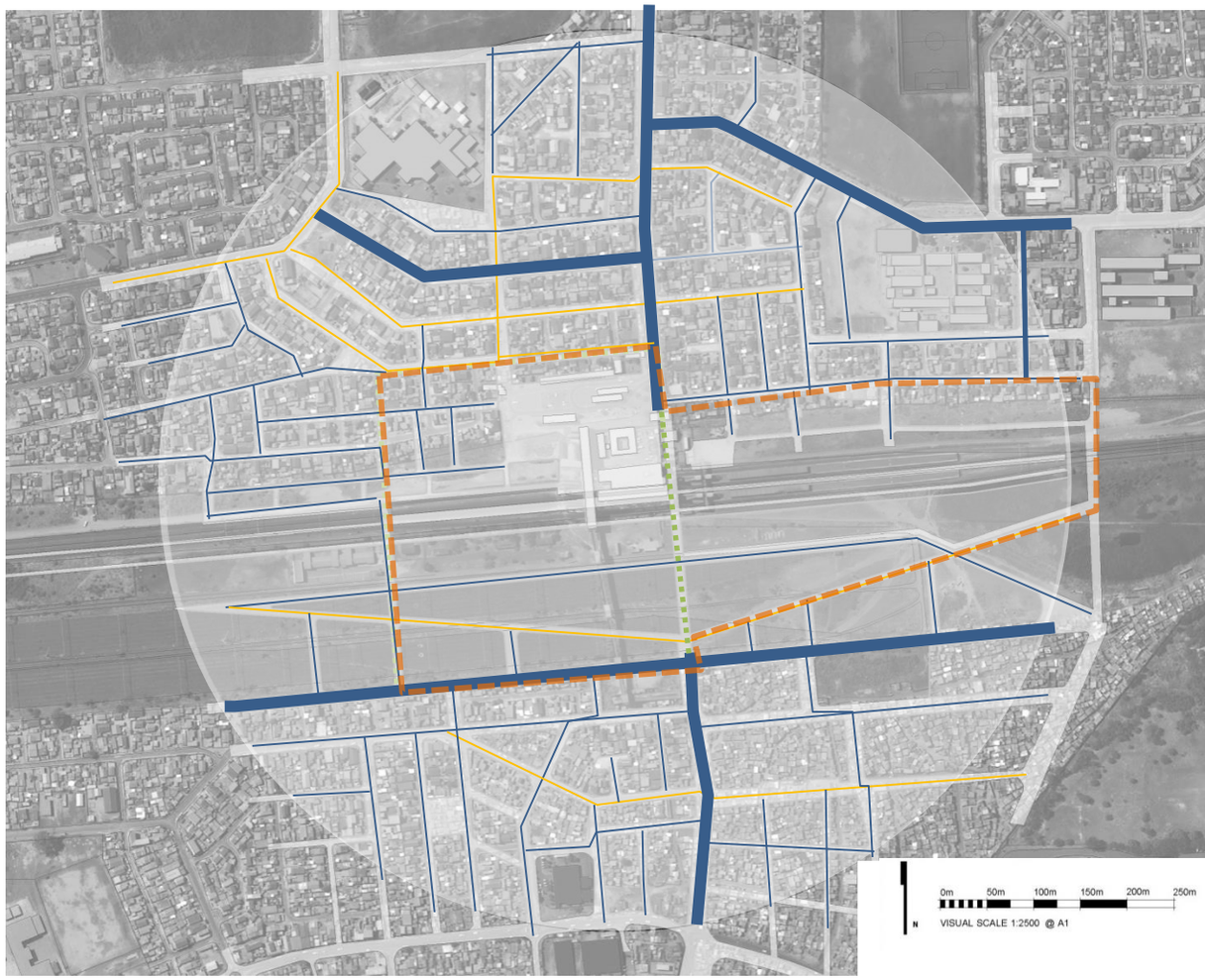
5.6.3. Response to design informants: **Movements - vehicular**

Before



Existing movement network

After



New movement network

Figure 96: Movement network

2. **Hierarchy of movement network** (Dewar)

3. **Civic nodes links with green walks to connect to greater** neighborhood—Trancik, R.
4. **An increase permeability** towards the spine road that leads to transit station

KEY:
- High activity roads
- Medium activity roads
- Low activity roads
- NMT route
- Bicycle loop

5.6.4. Response to design informants: **Land-Use**

Before



Existing Land-use

After



New Land-use

Figure 97: Land use patterns

5. **Land use** patterns designed **towards an integrated neighborhood.**

Key

- High School
- Primary school
- Residential houses (formal)
- Informal settlement
- Community facility
- Green structure
- Railway line
- Street network

KEY:

- Commercial
- Mixed use
- New Residential
- Institutional
- Existing residential

5.6.5. Response to design informants: **Land-Use - Built form & Open Public space**

Before



Existing Land-use

After



New footprint

Figure 98: Built form

6. **Public squares and public centre's** that serves the community (found within active node)—Gehl & Lynch
7. **Removed old railway depot line** to expands the train station's core — Dewar
8. **Densify the activity nodes with housing** (in opposed to the current fine grain for footprint) —Tachieva

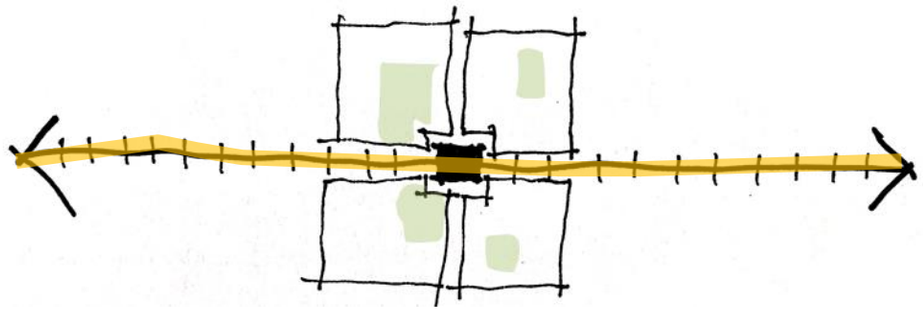
5.8. Conclusion

In reflection to the third sub question: ***Is an incremental and sustainable approach to better integrated communities restricted in areas that surround old railway stations?***

Given the study, there weren't many restrictions in terms of expanding the civic core, with this approach, came about the possibility of enabling compactness around the train station node, due to the underutilised railway depot line, where people currently lie destitute upon.

In terms enabling this expansion, and the development of new precincts, the people currently occupying this space, will undergo displacement, and to encourage trust and guarantee that with the expansion new social housing will be provided.

Incremental housing methods will be used to reconstruct the existing state of backyard living and densify upwards to house more occupants on one erf.



New precincts

Transport interchange design proposal

PROGRAM

KEY

1. Train station
2. Public square
3. Public park
4. Foot bridge
5. New residential
6. New development (Built form)
7. Agricultural land
8. New sports facility
9. Bus terminals
10. Taxi rank
11. New school

Existing

- Primary School
- High School
- Medical facility
- PRASA Building

0m 40m 80m 120m 160m 200m

VISUAL SCALE 1:2000 @ A1

N

Figure 99: Precinct development plan & Program

LAND-USE PATTERNS

PUBLIC SPACES AND TRANSPORT INTERCHANGE



Figure 100: Precinct development plan & Land use patterns

5.7. Stages of intervention

In reflection to the second sub question; ***Can new precincts form in an area surrounding trains stations, where movements, services and accommodation are integrated?***

The transport interchange (figure 101) is the heart of the design intervention. However, to establish a starting point for the entire intervention, it is recommended to start with a pilot phase that will enable future growth and development of the following interventions that will also take the form of sequenced stages.

This process would enable developments such as accommodation to be integrated in between these smaller precinct developments.

Furthermore, Land use patterns designed towards an integrated neighborhood. Where a strong emphasis on pedestrian movement is the top on the list, then comes the positioning of social housing within close proximity to the transit interchange, and the connectivity from the civic node to the greater neighborhood.

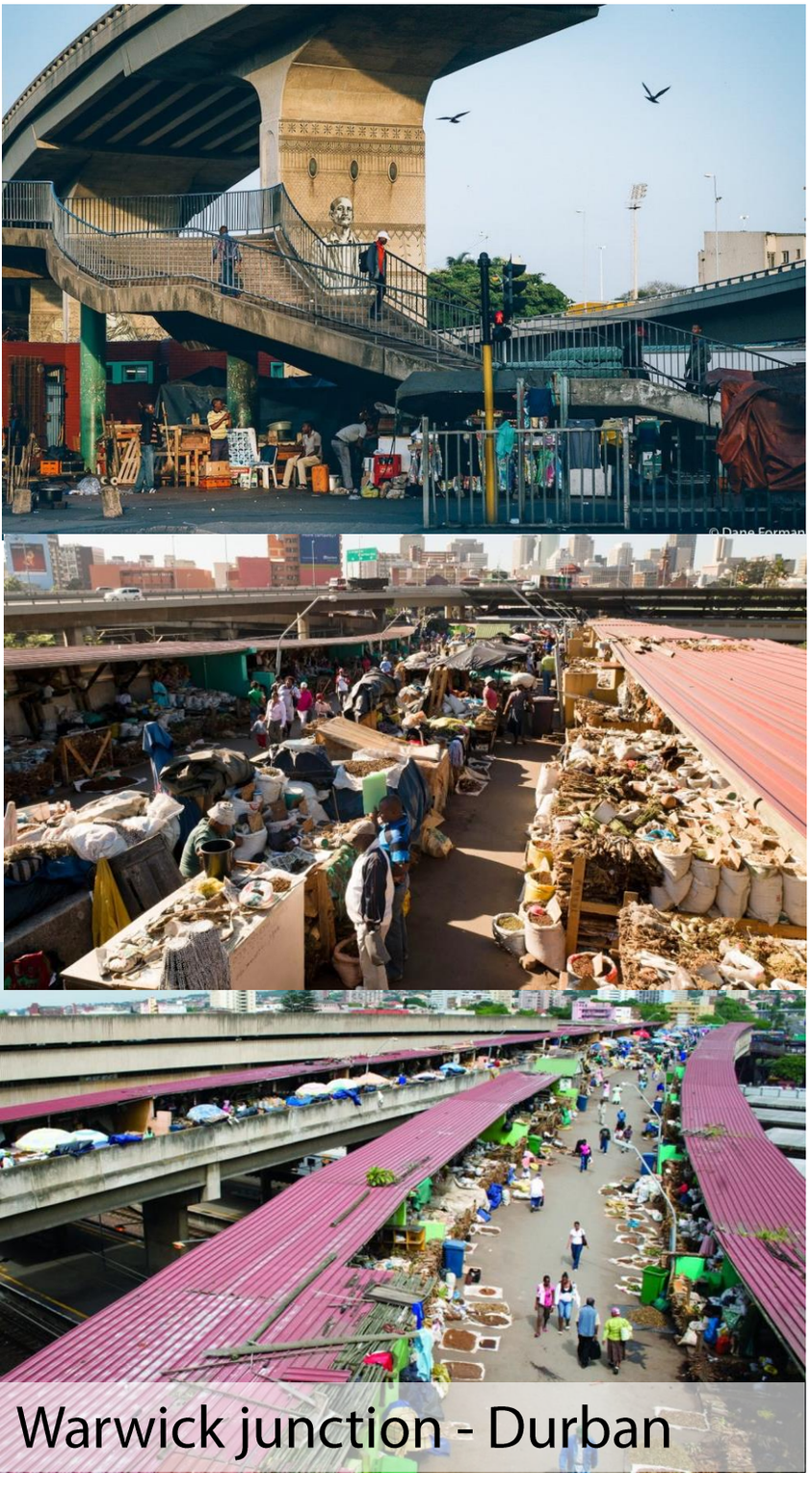


Figure 101: Transport interchange design



Figure 102: Transport interchange design plan

5.7.1. First point of design intervention





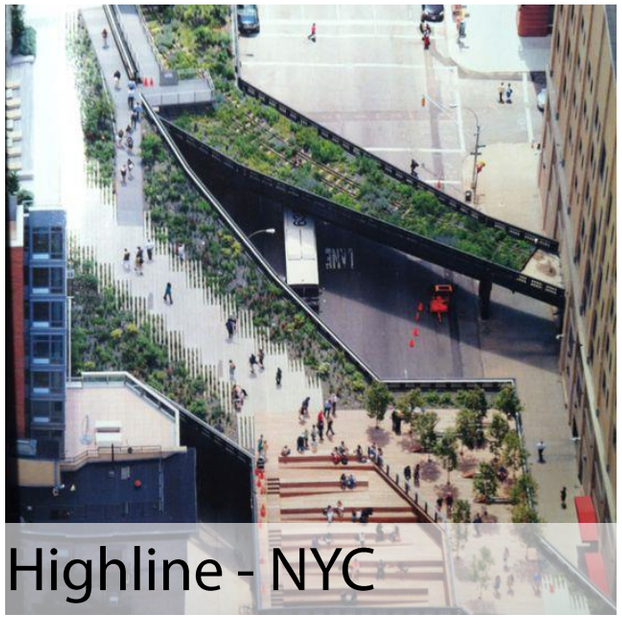
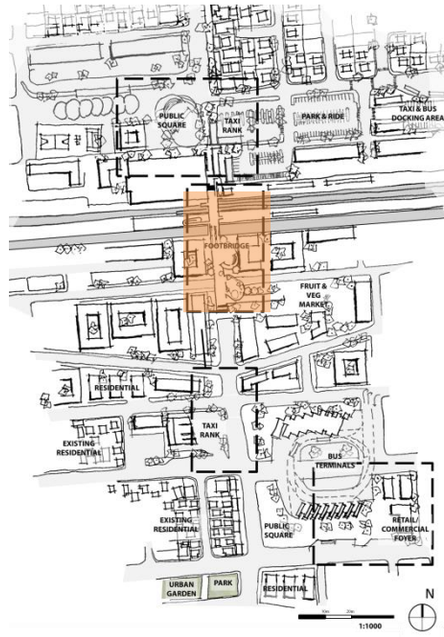


Figure 103: Footbridge precedent ; Seoul, NYC and Durban



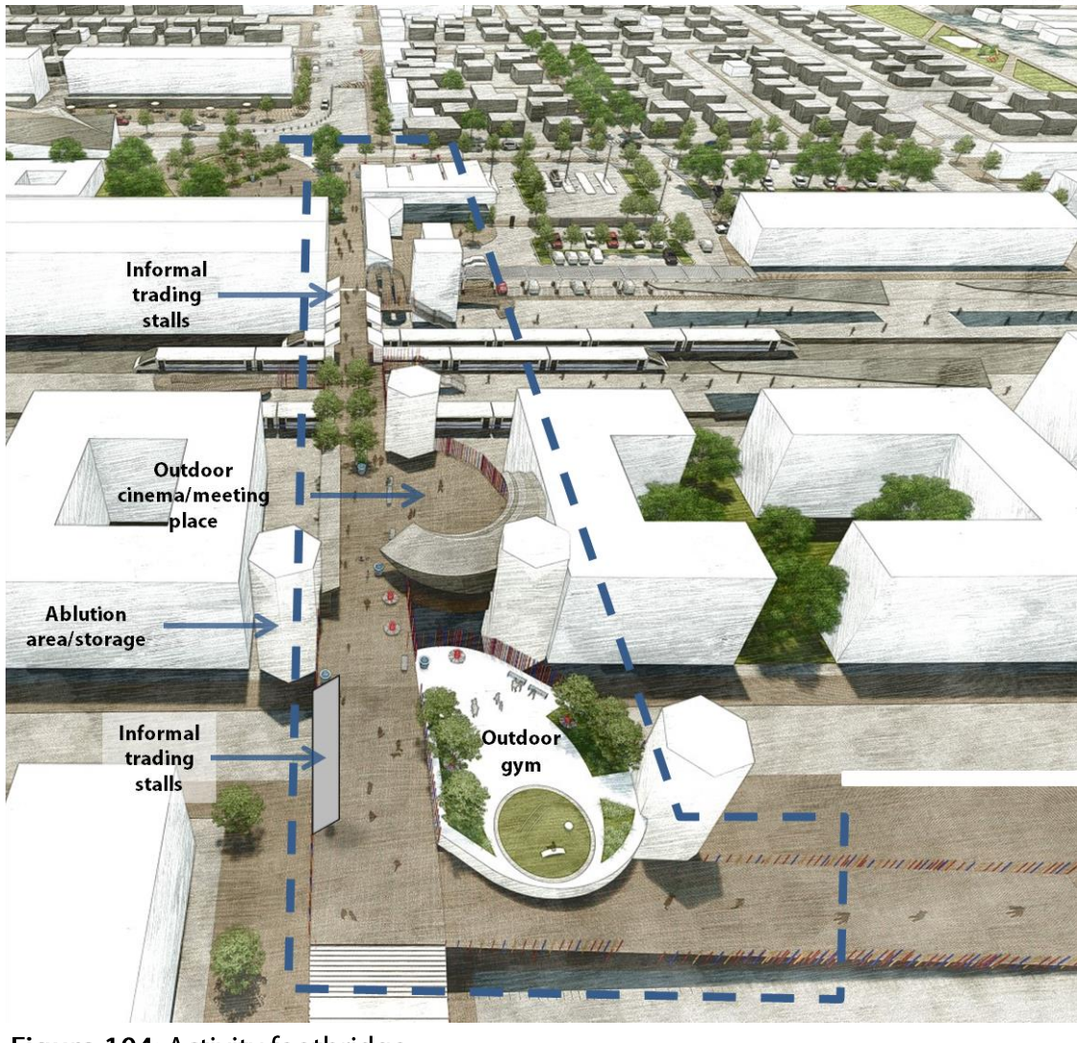
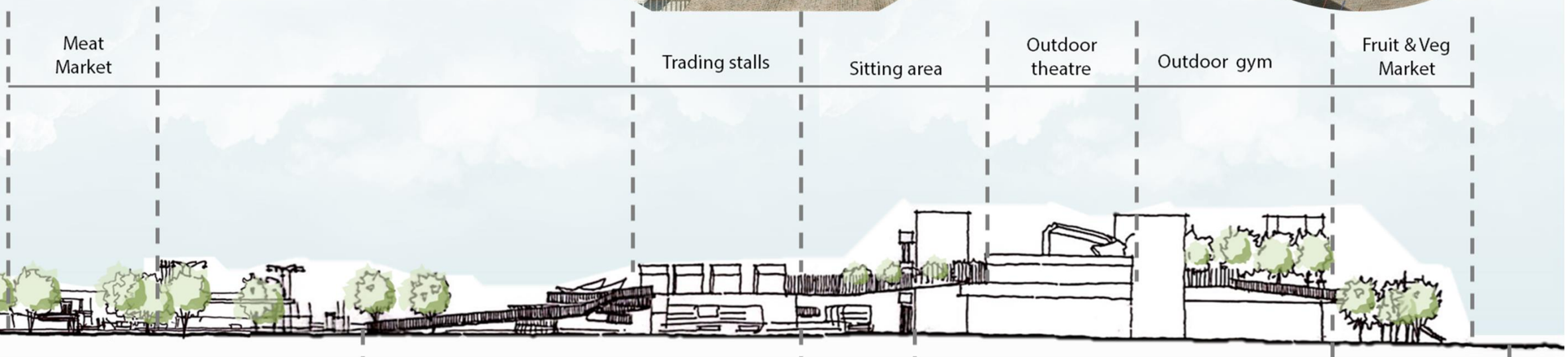


Figure 104: Activity footbridge

As a starting point to the greater scheme of the conceptual design resolution, the strongest point to start with would be the footbridge that links either sides of the railway line. By doing so, the physical connecting barrier will be better connected and allowing for better integrated and more connected link between the two communities.



SECTIONAL Elevation – Footbridge



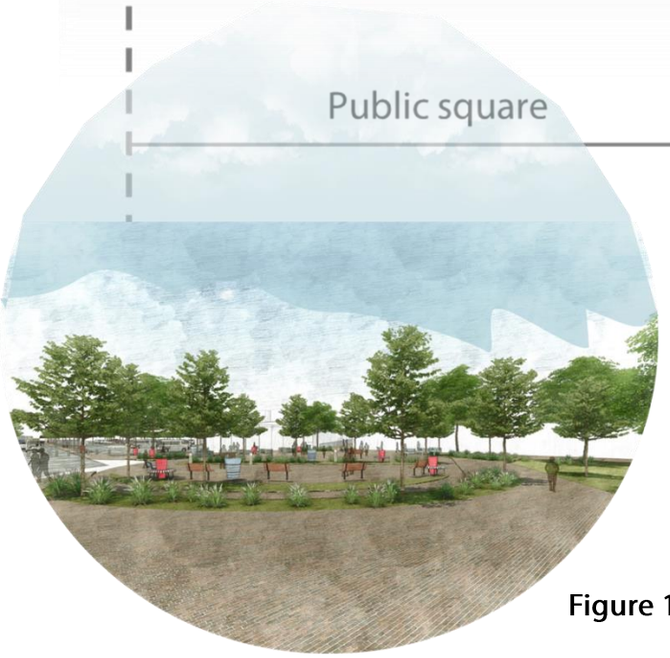
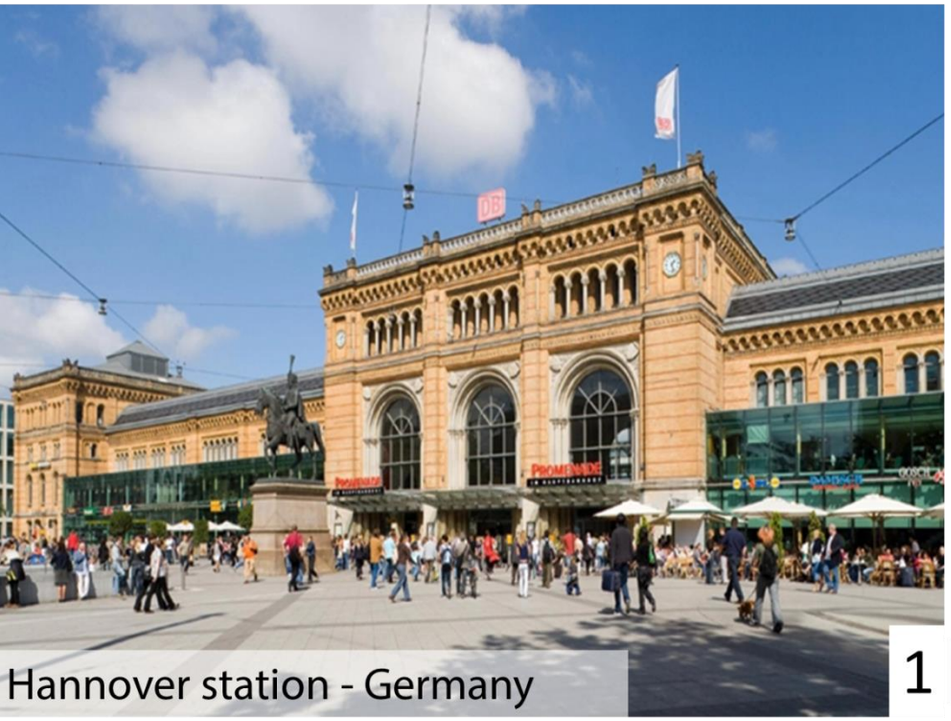




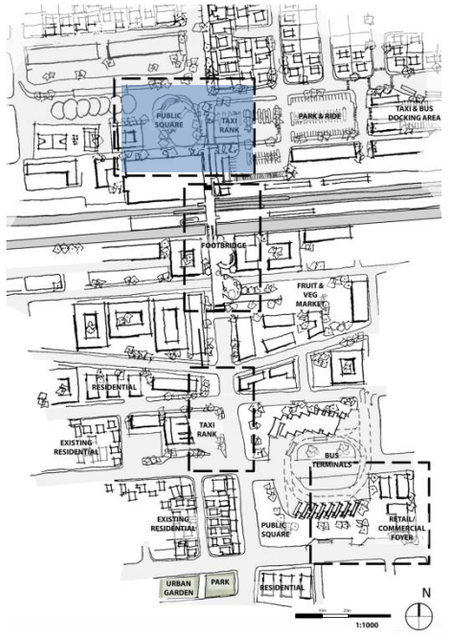


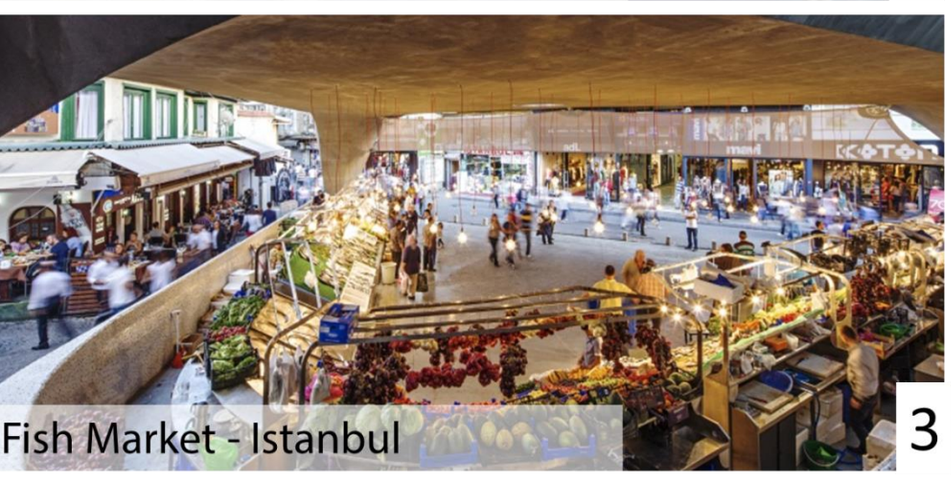
Figure 105: Section Activity footbridge

5.7.2. Second point of design intervention
Train station upgrade and new Public Square

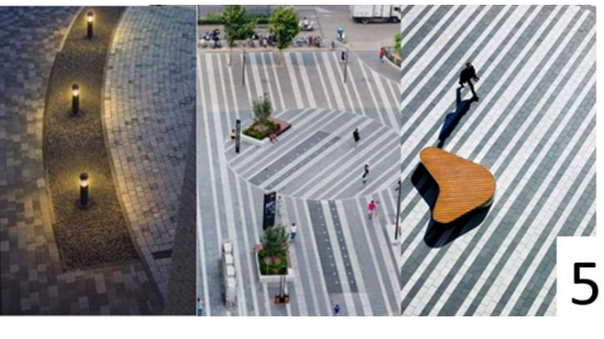














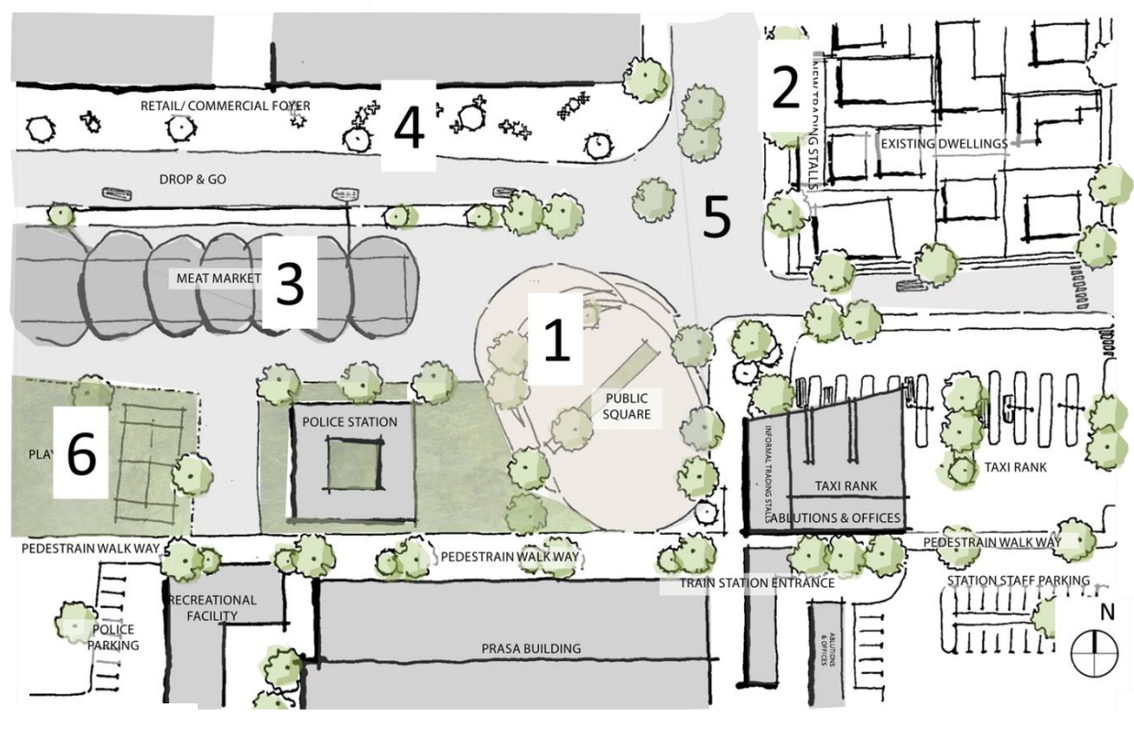


Figure 106: Public square



Figure 107: Public square plan



Figure 108: Trains station Foyer as a public space

5.7.3. Third and Forth point of design intervention

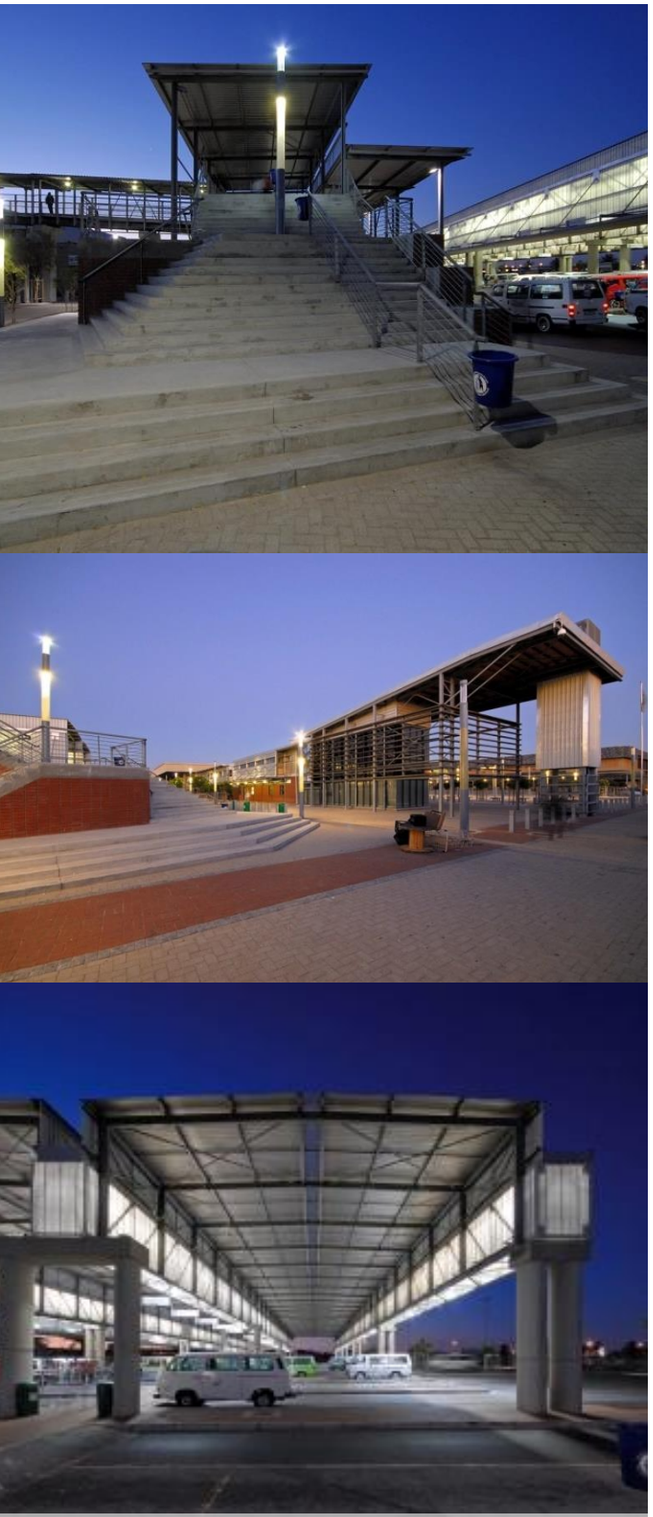


Figure 111: Mitchell's Plain Public Transport Interchange – Cape Town

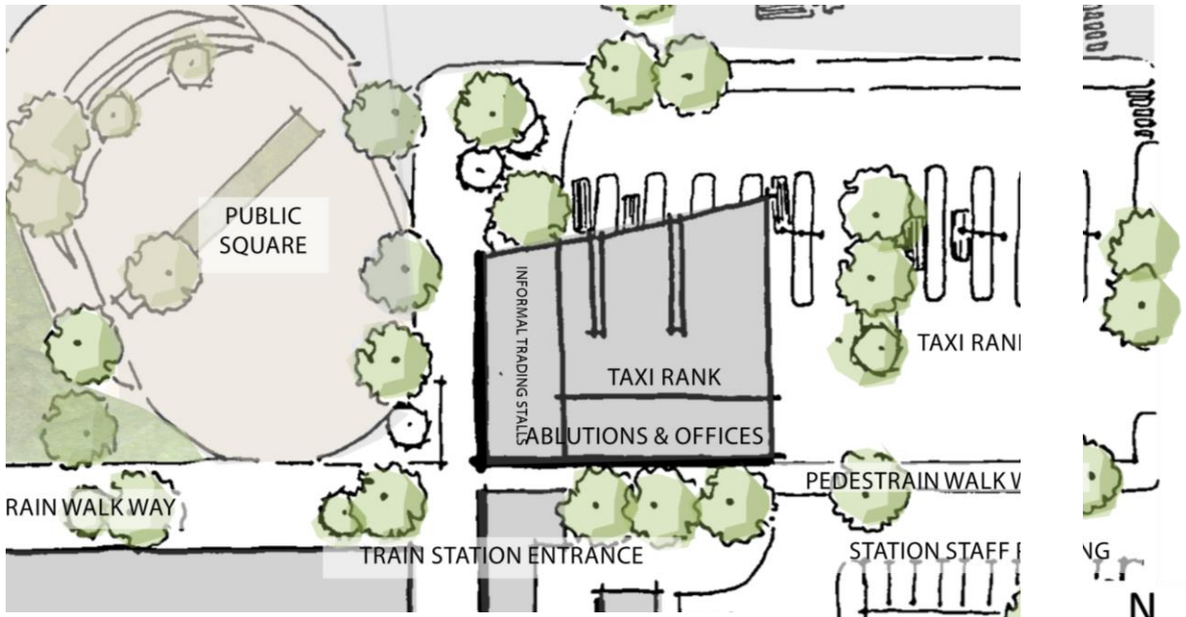


Figure 109: Northern Taxi rank entrance



Figure 110: Northern Taxi rank entrance

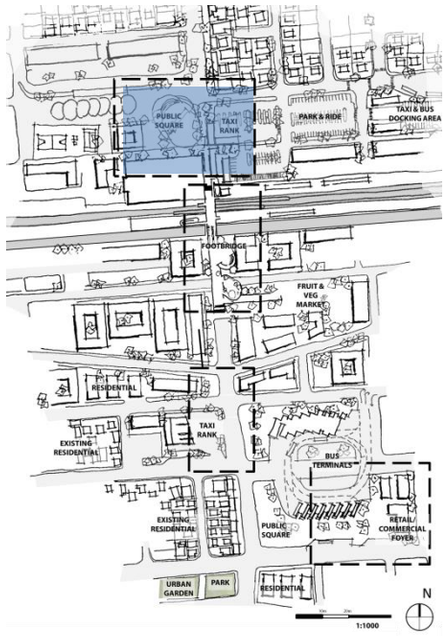




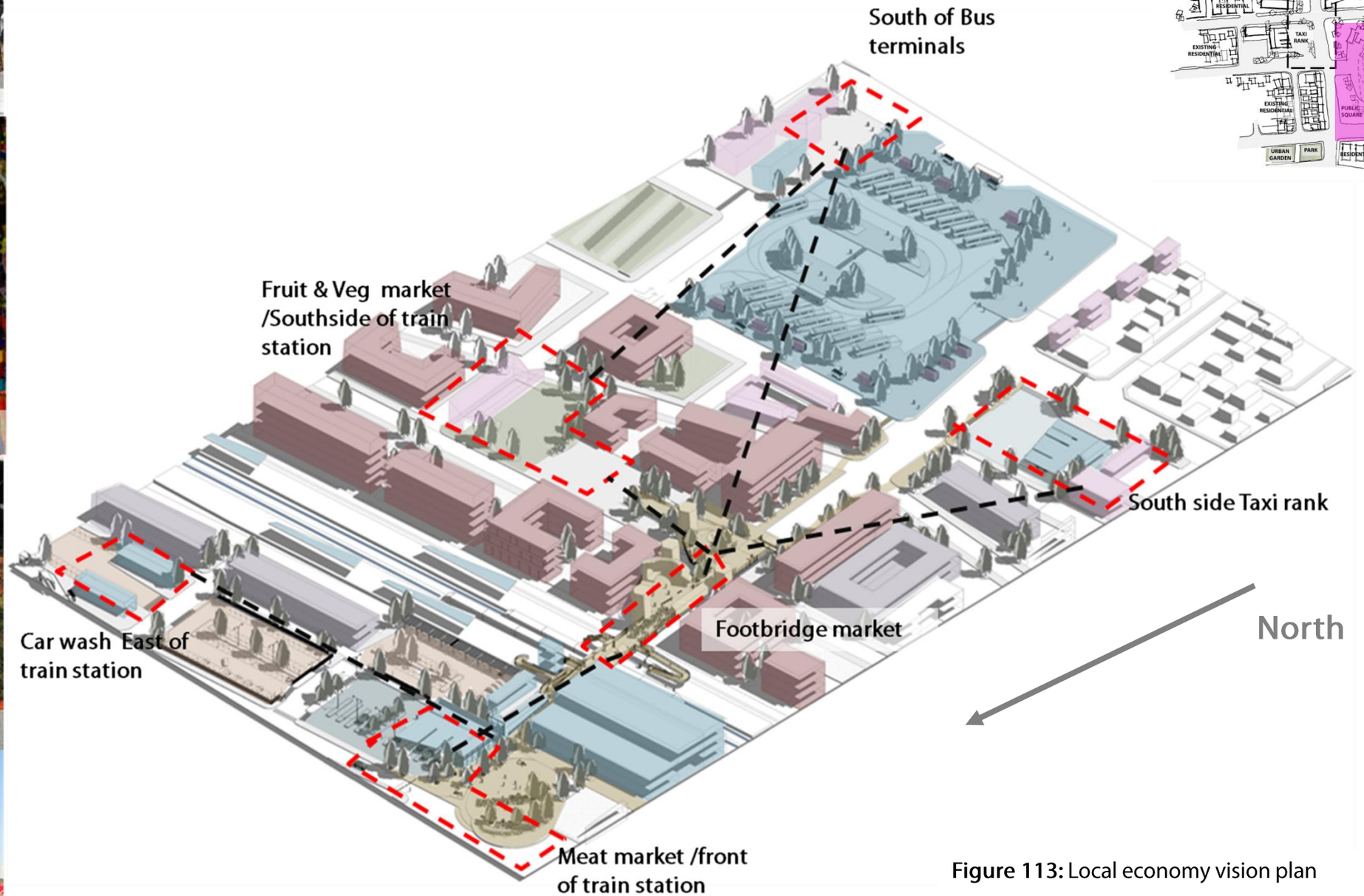
Figure 112: Trains station Foyer as a public space

5.7.4. Fifth point of design intervention

The bus terminals and the Southern Taxi rank will take up the last stage of the transport interchange precinct.



Figure 114: Informal economy narrative



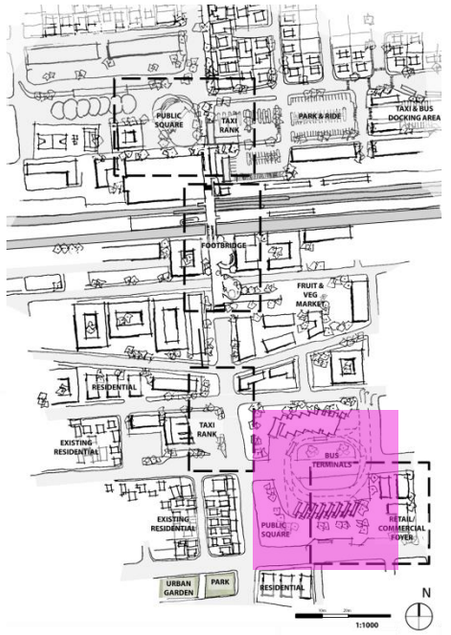


Figure 113: Local economy vision plan



Figure 115: Southern Taxi rank entrance

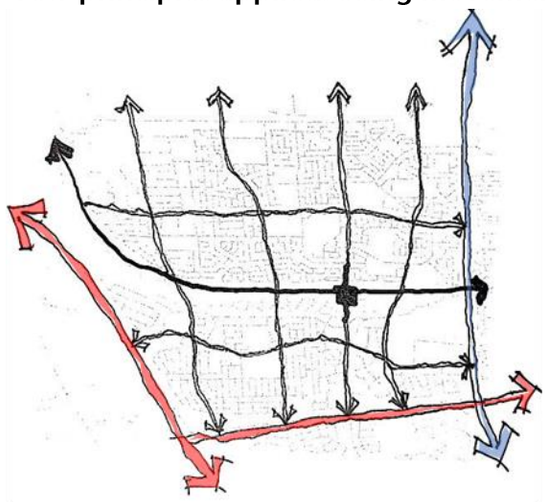


Figure 116: Bus terminal public square

Street network repair proposal

5.8. Street Network repair proposal

TOD principles applied: Using movement and road network as a design element

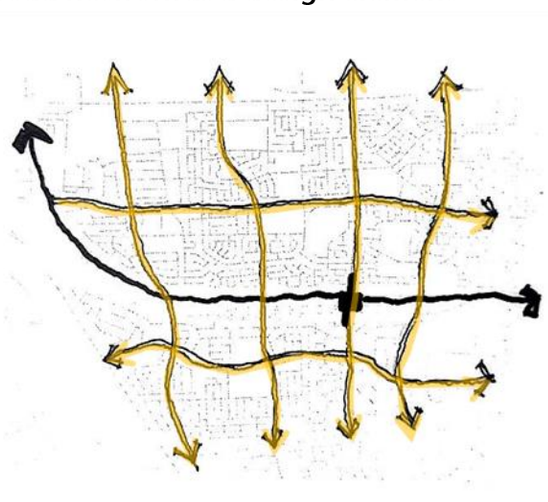


ARTERIAL
- **Transit**

Cars

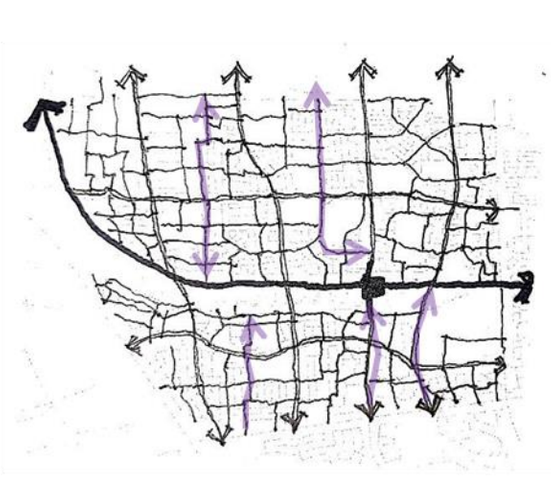
MOTORWAY/
Transit
Cars
Graded separated crossings for pedestrians and cyclists
BRT

CLASS 1 & 2 - Motorway/ Primary Distributor Arterial /
Regional Distributor



SUPERBLOCKS (Medium speed)
- Transit
- Cars
- Bicycle lanes
- Sidewalks

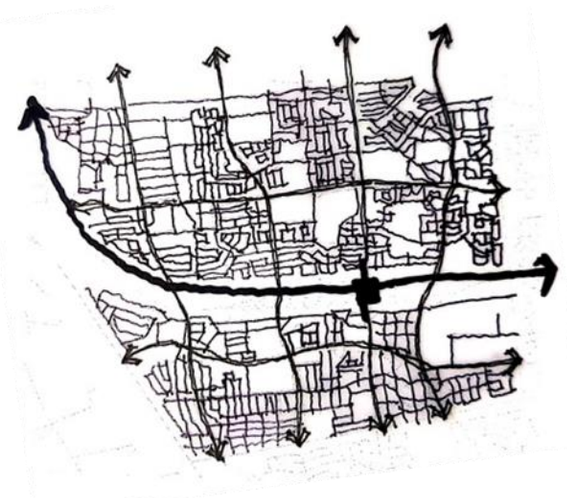
CLASS 3 & 4 - CBD Road / Activity Street / Local Distributor/ Boulevard.
District Distributor



SECONDARY STREETS
Narrow local
Bicycle lanes
Sidewalks

CAR FREE LANES
Some of these streets will terminate into the medium speed street network

CLASS 4 - CBD Road / Activity Street / Local Distributor/ Boulevard
CLASS 6 - NMT Route /Greenway/ Multi Use Pathway



TERTIARY STREETS
- **Narrow local**
- **Bicycle lanes**
- **Sidewalks**

CLASS 5 - Residential Street

N

Not to scale: diagrammatic representation

Adapted from complete streets CoJ

Figure 117: Conceptual diagrams showing different **movement networks**

The train station stands as an anchoring point at the centre of the study area alongside the restructuring of the movement network, . This creates an opportunity to use the train station as the main nodal point and align it to the relevant street networks (figure 117) which filter into the greater neighborhood and helps improve connectivity and promotes Incrementalism and sustainability within the neighbourhood.

MOVEMENT NETWORK

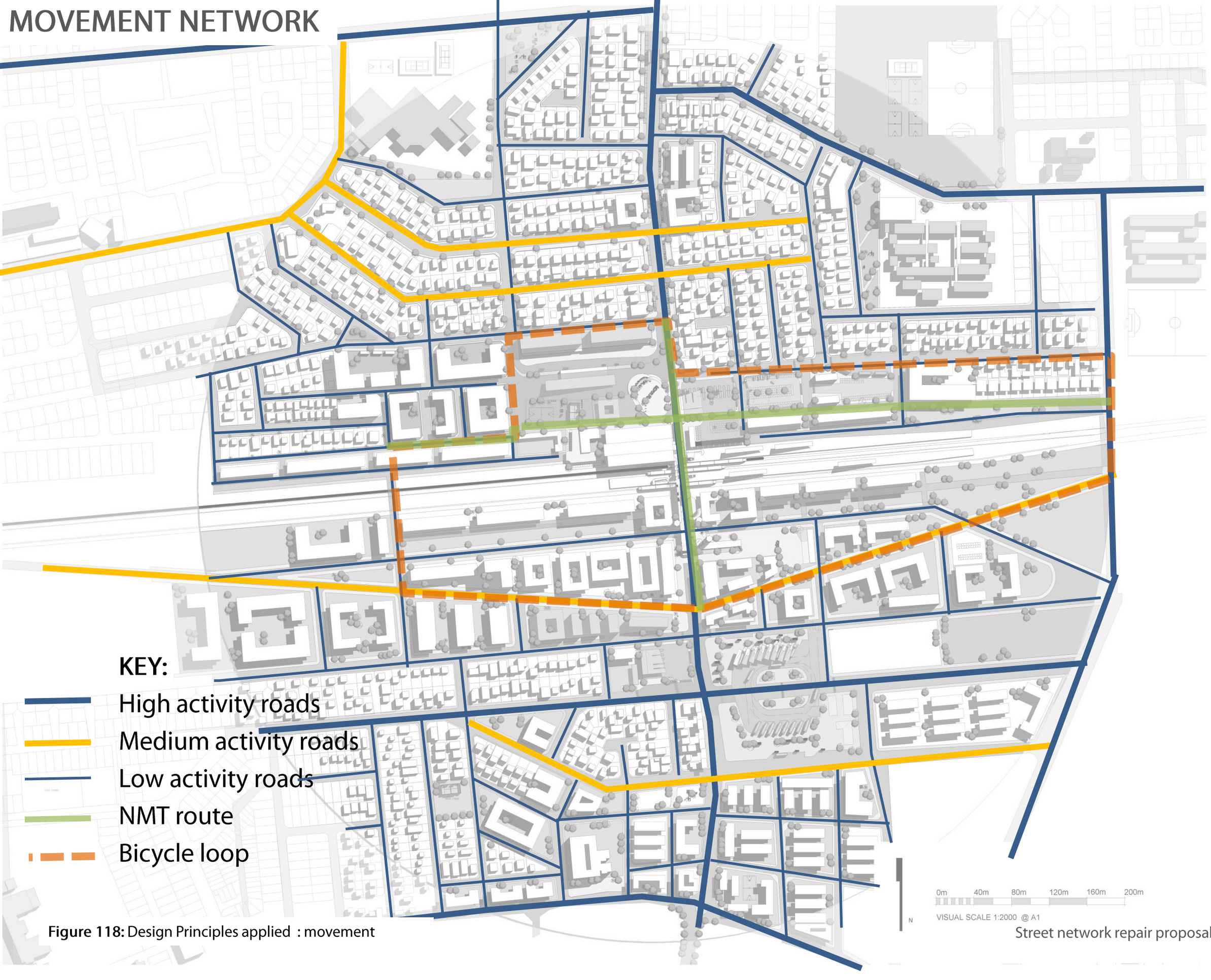
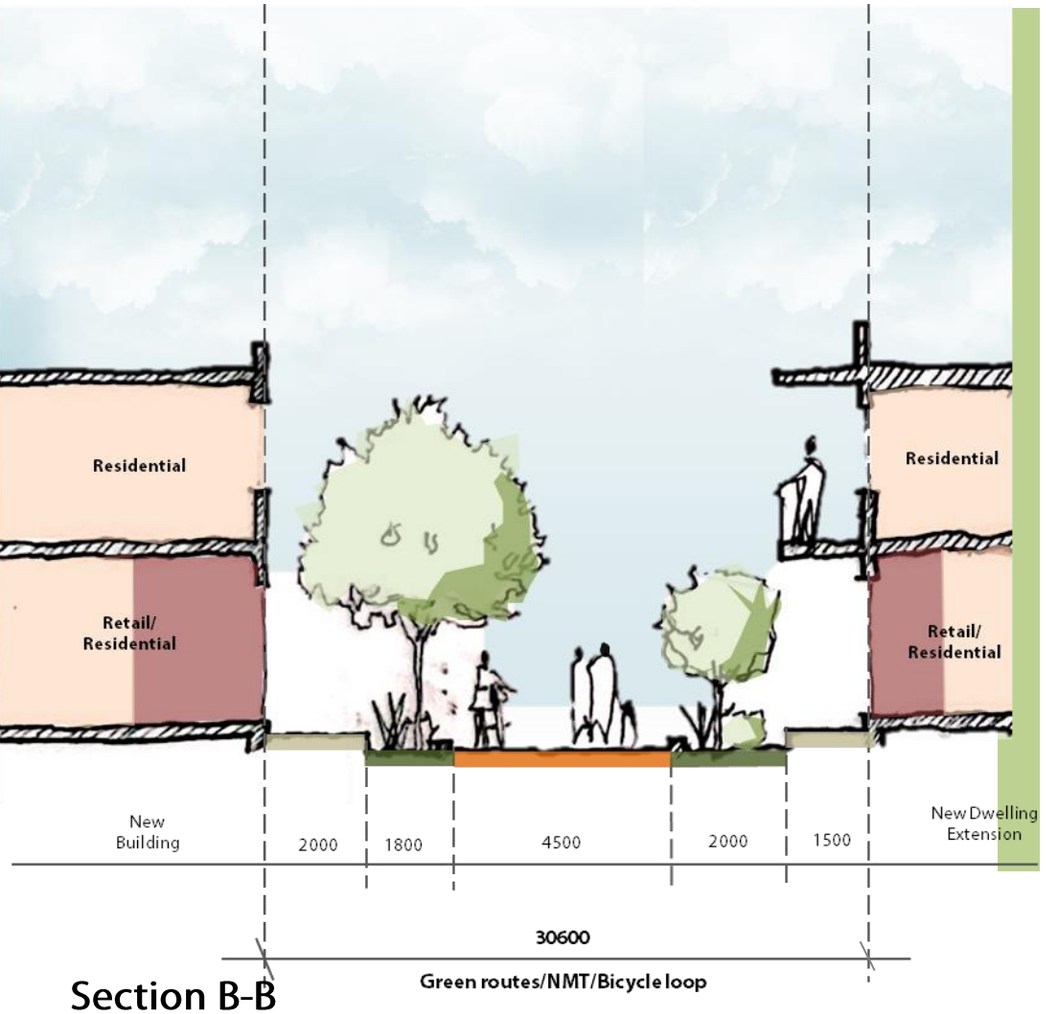


Figure 118: Design Principles applied : movement



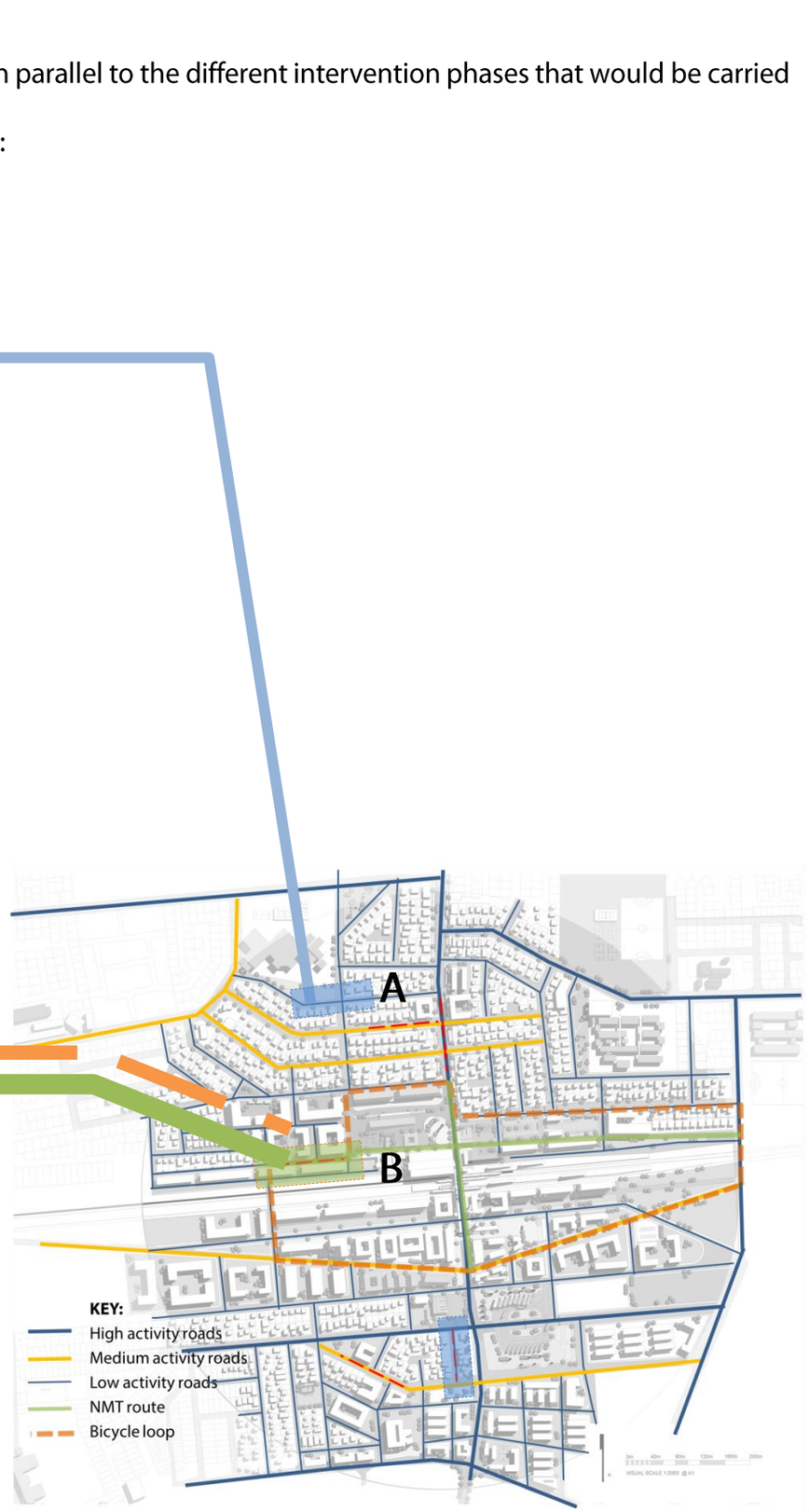
Section A-A



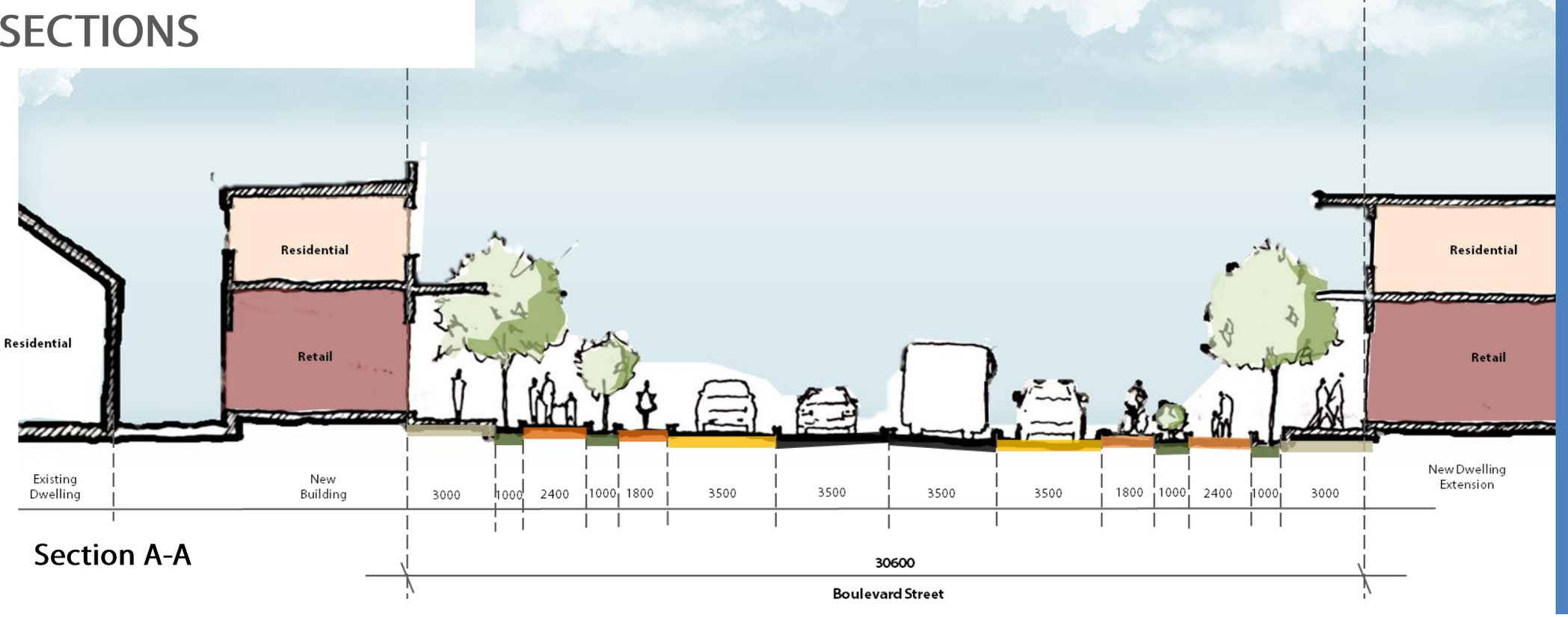
Section B-B

The street network can run parallel to the different intervention phases that would be carried through.
Theses streets will include:

- High activity roads
- Medium activity roads
- Low activity roads
- NMT route
- Bicycle loop



SECTIONS



Section A-A



Section B-B





Figure 120: High streets as a public space

Chapter 6: Key findings

6. Key findings of the location to settle

As urbanisation increase, there is also a transition that takes place during rural - urban migration. From where the person moves from, to where the person moves to? Is often an ambiguous situation to the migrant more especially, if they moving from disadvantaged backgrounds. Most common things to consider, is a place to sleep, eat and be able to generate an income during that stay in the city (Tacoli, et, al., 2015).

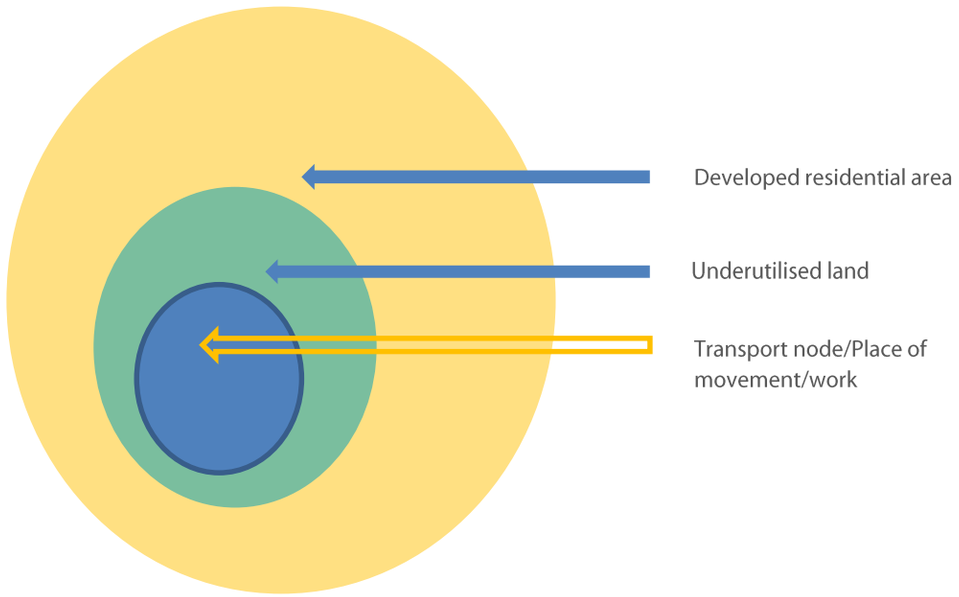


Figure 121 : Illustration by author based on Satterthwaite's (2018) theory.

With main aim being saving money, access to work and school is often the determining point for where the migrant choices to live. The quality of the site (to live in) is disregarded by the migrant. This process of looking for a place to stay could also possibly result in illegal, land occupation to meet the migrants' needs at that moment of time. As a result, costs for rentals are almost non-existent and could lead to the development of an informal settlement that is at the convenience of the migrant.

However, this process comes with threats of evictions, very poor services and infrastructure, living conditions and exposure to crime and health issues (figure 121: Satterthwaite, 2018).

Desired location

Direction or the spatial aspect of migration can be highly influenced by social challenges faced by an individual who migrates from one place to another. Some other aspects could include; wit, poverty and inequality. Furthermore, when the process of rural-urban migration or circular migrations takes place the individual who migrates is often faced with an unequal access to land at their point of arrival. This often clouds the individual's idea of moving to the city and expectation of what one thought they would find (Obeng-Odoom, 2017)

Expectation to the destination is often linked with an oasis of better living conditions, which mainly include new socio-economic conditions and basic infrastructure to maintain a healthy livelihood.

Arrival city

Arrival cities' refers to various realities. The arrival city is that part of the village which has become urbanised. The arrival city is also that part of the already established city where migrants first settle when they move away from their village.

Conclusion

Areas situated in the peripheral location of an urban area, face results of power access to land. Whereby majority of the under privileged migrants end up being regarded as landless peasant, who are often located at the peripheral land of the city (UNDESA,2019).

Chapter 7: Conclusion

Conclusion

Artificial or natural contexts and the nature of urban areas are morphed by how people use urban spaces. This is highly dependent on a network system, that works well for human use, and that successfully contribute towards place-making.

Naturally, humans convert these spaces into community hubs. Which then later take form into formalized purposeful functional spaces. This then emphasizes the importance of inclusivity and place-making when working between the urban context and places of movement. This plays a good role in enabling people to have the opportunity to have an opinion or make a solid contribution towards making their environments better places for living (PPS, 2015).

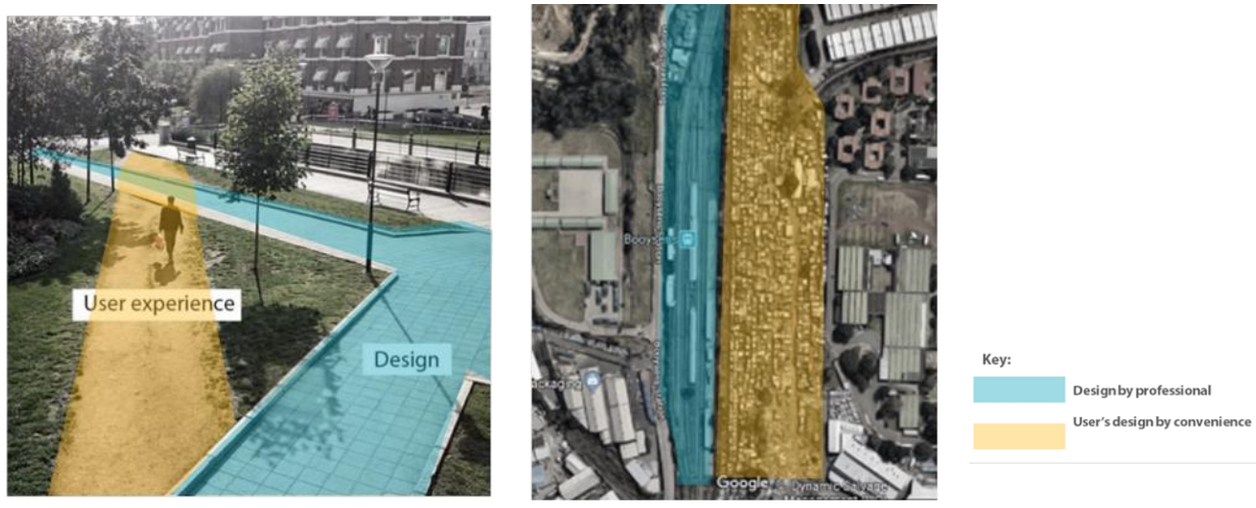
As a result, urban transport planning also becomes one of the many aspects that should be integrated within urban land-use planning to avoid emerging land invasions within pockets of the city that are located near transport facilities.

After looking at the case of Philippi train station, and how a new informal settlements infill took place near train stations (Titisari, et al. 2016). I came to the conclusion that people who interact with a space will naturally, consciously or unconsciously, modify the spatial interventions that occupy an area to better enhance their user experience.

This notion is evident predominantly in public spaces, such as a park, where human activities and patterns suggest new ways to respond to a site as seen in figure below, where users no longer conform to the prescribed design that comes with its physical barriers and rather create their paths. Booysens, in Johannesburg (figure) is one of many other realities of convenience and place-making, just as one would have seen at Philippi Train station.

When looking at creating an incremental approach towards rural-urban migration through the influence of movement. People, streets, public open spaces, shared facilities places of works and places which people call home, have a great impact on the community and how the bulk infrastructure supports the livelihood of the neighborhood.

Using urban design principles such as Transit-Oriented Development. A integrated community can be developed used TOD as a catalyst of upgrading existing infrastructure and helping to create a guide for how different frameworks can be applied to specific needs within the community.



: Desire paths - Natalia Klishina, : Booysens train station

Figure 122 : Desire path narrative - *source on image*

In reflection to the main research question:
Can Philippi train station incorporate Transit-Oriented Development (TODs) principles with a high focus on the need for social housing and publicness as part of its precinct planning?
The opportunities sees the application of TOD as a great possibility to be used as a driving vehicular to such an intervention. However, township communities and the great pressure of urbanisation seem to make such planning challenging to have them executed as clean-cut plan.

The rate of rural urban migration increases constantly, which often expands the informal settlements that are found in townships.

The greatest solution to such a challenge would be to emphases a social housing and arrival incubation component within the TOD elements, that would be specific to places such as township. This might not solve most challenges, however it could help facilitate the process of rural-urban migration yet maintaining a sustainable growing community.

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