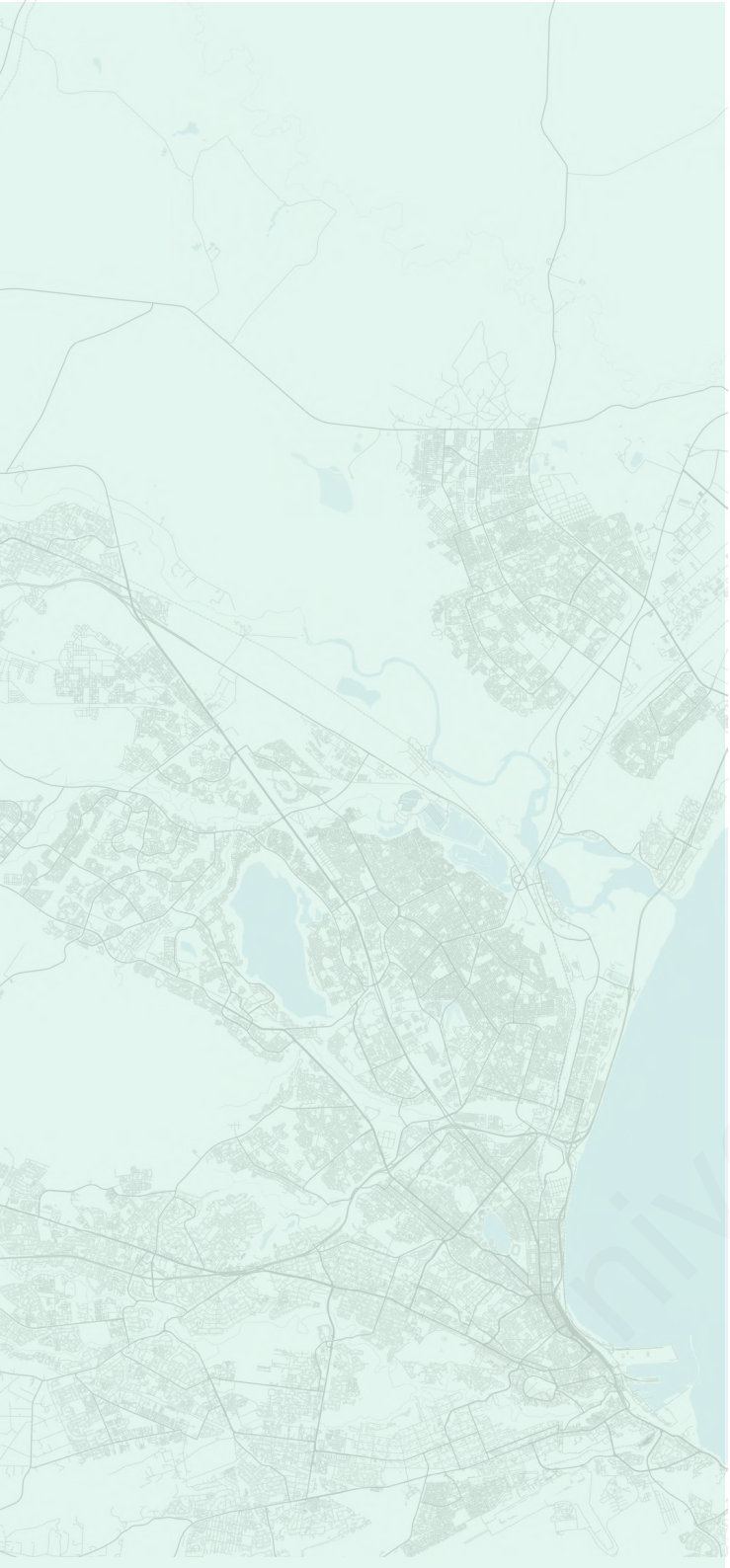

[Re]connected and On Track

Integrating the Nelson Mandela Bay commuter rail line with the Swartkops area through a re-imagined future

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Masters of Urban Design

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University of Cape Town

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[Re]connected and On Track: Integrating the Nelson Mandela Bay commuter rail line with the Swartkops area through a re-imagined future

An urban design research project submitted in partial fulfilment of the requirements for the degree of:
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Abstract

South Africa remains shaped largely by its apartheid past and its associated Modernist planning practices. This has left South African cities as fragmented, disconnected, and inequitable spaces, especially for those who still directly feel the effects of exclusionary planning practices.

The commuter rail line in Nelson Mandela Bay, running between Gqeberha (formerly Port Elizabeth) and Kariega (formerly Uitenhage) is an example of a public transport system that has failed to adapt to changes in where and how people live and move. As such, it is characterised by low frequency, low usage, inaccessible and outdated stations, and antiquated infrastructure. The line is the least used of all the Metrorail systems in South Africa by a large margin, and as such there has been a reluctance to invest into improving the existing system. Many of the stations are far removed from where the majority of the people live, particularly in the township areas of Gqeberha - the most densely populated neighbourhoods in the metro.

The line itself runs, for a large portion of its length, along the Swartkops Estuary and river, a partially protected conservation area.

Various plans to improve the line have been proposed, but numerous factors have led to these not being implemented. A long-term plan has involved the so-called Motherwell Loop, which aims to connect the far-removed township of Motherwell into the existing rail system.

This project looks at how the line can be re-imagined: not just as an infrastructural project - but as an integrated system that adds to the urban life in the metro, and creates a spatially just urban environment. This is done specifically through re-imagining the railway line by rerouting the commuter line to include the township of Motherwell, and by re-imagining the rest of the line as a corridor that connects people to the Swartkops natural system, to allow for social justice in terms of access to the city and to the natural environment.

The focus area in this re-imagining becomes the Swartkops area, and the corridor linking the Njoli Square node to the Swartkops Station, village, and estuary, running through a re-imagined urban campus housing the Nelson Mandela University Ocean Sciences Campus. Currently the Swartkops Station sits isolated from its main users - people from the Kwazakhele township - and sits in an area of intense environmental degradation. This corridor of activity becomes defined by the thresholds it crosses in, and how these thresholds or edges are defined: the township to natural edge, the commerical corridor to residential edge, and the estuary to activity edge.

Through these interventions, the village of Swartkops becomes a focal node in the urban fabric of Nelson Mandela Bay, and is integrated with its adjacent neighbourhoods, though a mobility corridor that links all these elements together through the creation of a safe, walkable and meaningful space, in the pursuit of a more spatially just urban landscape.

Keywords: Integration; Railway; Connection; Spatial Justice; Urban Fabric; Revitalisation; Transportation corridors

Figure 1: Nelson Mandela Bay as seen on a satellite image at the Metro Scale (Source: Google Earth, 2024)

Acknowledgements

I am incredibly grateful to have been given the opportunity to study urban design at the University of Cape Town, and to the people who helped make this possible.

To my parents, for always supporting me wholeheartedly in everything I do.

To Justine, for being there for me during this year and always being willing to help with anything, and for your constant words of encouragement.

To my fellow urban design students - Liz, Gwen, Deidre, Tshepo, Lungelo and Wrixon - I have learnt so much from you this year. I am going to miss the discussions, friendship and comraderie that we had this year, but am sure that it's not the last we'll see of each other.

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To Hedwig, Jani, Janine, Leigh and Claire, I have learnt so much from you all, and from your enthusiasm and energy for the course throughout the year.

And lastly, but most importantly, my thanks goes to God for being with me during this year and for giving me the strength to persevere during tough times.

I would like to dedicate this work to my late grandmother, Dini Jansen, who continues to inspire me every day.

Figure 2: Collage of elements along the Gqeberha-Kariega railway line
(Source: Author, 2024, using images taken on site and from Google Maps)

Table of Contents

GROUNDING

Figure 3: De Mist Station in 2021 (Source: Mbovane, 2021)

Introduction

The rail network of South Africa, particularly passenger rail, has been neglected to the point of becoming largely irrelevant for many South Africans (Pivnic and Lewis, 2020). Besides the issues of a large amount of freight now travelling by road - and the resulting issues of road safety - the decline in the rail network of South Africa has meant that even where these services are still running, they often follow historic routes that have not been upgraded or rationalised to suit current situations.

Rail has the possibility to transport large numbers of people in a low-cost and efficient way, but in order for this to happen optimally, rail services, and particularly suburban commuter rail, needs to exist in a lively urban environment that is safe and accessible to all people.

This research looks at the commuter rail line between Gqeberha (formerly Port Elizabeth) and Kariega (formerly Uitenhage). This single line forms the complete Metrorail system of the Nelson Mandela Bay Metro, and has for many years been neglected in terms of frequency, maintenance and development. As such, the stations along the line are no longer located where the majority of people live and work, and the line skirts around large parts of the city, rather than going through the neighbourhoods, where it would be most accessible to all people.

There have been attempts to reroute parts of the line, or add to the existing line, and to incorporate rail service from other stations that do not form part of the direct line (PRASA, 2016). There are also plans to introduce the new blue “People’s Train” to the line in the coming years, replacing the ageing yellow Metrorail trains.

Regardless of these interventions, the issue of a lack of life and vitality at the stations along the route are issues that require addressing. The existing stations are currently not forming part of an integrated urban environment.

This research looks at ways to incorporate the existing rail infrastructure into the surrounding urban fabric through urban design. The existing line has remained unchanged for over a century. Over this time, the towns of Gqeberha, Despatch and Kariega have grown immensely, with much of that growth occuring under apartheid-era laws such as the Group Areas Act. This has meant that development has occured far from the civic and commercial centres and from other community services.

This research looks to re-imagine the role of the railway line in an holistic way - one that does not focus on its role as just a mover of people and goods, but one that serves a broader role in the integration of urban spaces and communities, and in helping to break down apartheid-era spatial barriers. The relationship of the railway line to its surrounding neioghbourhood, hubs of activity and natural systems is analysed in order to gain an insight into the role that the stations and the line can play into fostering a more inclusive, dense and mixed use urban environment.

Drawing on Warnich and Verster (2004) on corridor development, as well as on creating lively urban space (Dewar and Uytenbogaardt, 1991), the research incorporates the existing literature into the local context to further the aims of the project - to re-imagine the role of the railway line to further spatial justice and create lively urban spaces. Soja’s (2008) notion of spatial justice is a key lens thorugh which the project is viewed - ensuring all decisions are made for the benefit of all - and especially marginalised people.

The research begins by understanding the system as a whole, and the historic reasons for why it no longer functions as well as it once did. Through contextual analysis of the various layers, as well as the previously proposed plans for the system, and looking at precedents, a contextual framework is developed that re-imagines the system itself - one that provides access to crucial mobility for many people living in the most densely populated townships in Nelson Mandela Bay.

Upon the development of a contextual framework, the focus area - the Swartkops node - is interrogated further to understand the system at a multi-scalar level. The confluence of the urban township and suburban environment, the degraded natural system, the rail system, and the estuary system make this area the ideal focus area towards an urban design framework.

All the decisions taken are done through the methods described in this document, which ground the interventions into relevent, real-world solutions for improvement. This research, along with the use of precedent and the writings of others, manifests itself as a series of strategies and interventions that can be applied, as informed by the contextual and urban design frameworks, to create improvements to the quality of life for all people in the area - and particularly in the focus area.

The final result of the research is a strategic framework plan for the Swartkops focus area which unfolds, through implementing a series of principles, with a series of precinct-based interventions in the precinct, through a phased implementation plan which guides the timeline of the project.

This, in turn, hopes to create a series of spaces, and an overall system, that responds to the research question and goes a long way into making the entire system a more spatially just system for all those who live in it.
The process is underpinned by the notion of spatial justice, and in creating a more just and equitable metro - undoing the still-prevalent apartheid city model in search of lively and productive urban spaces in South Africa.

Positionality

This research project has come about from a variety of factors and events. My positionality as a researcher has been integral in the research and in developing the topic.

The research has emerged from a culmination of several experiences, events, and interests, all occuring in a certain timeframe and situation in the South African context. My time as a student at the Nelson Mandela University in Gqeberha / Port Elizabeth developed in me an interest in the city and in the way it worked (or, in some cases, didn't work). Furthermore, while still a student in Gqeberha, a personal interest in the rail system emerged, and reasons for its lack of use in a country where affordable public transport is so sought-after.

These factors, combined with my interest in why South African cities remain so divided and inequitable places to live, culminated in the opportunity for all these aspects to come together through a research project that looks into ways the existing rail infrastructure can be better integrated into the existing urban fabric, and ways to create life around the train stations and connect them into the existing movement corridors.

My positionality can be further clarified by my background. I am a white male South African, nor have I lived directly in the area of focus of the research, and as such, gaining a more holistic and nuanced understanding of the area of study is crucial through on-the-ground research.

My positionality as an urban design student at UCT must also be taken into account. I enter the space through the lens of a researcher, and so I should remain aware of the ways that my experience of a space differ from that of the people that live, work and play in these spaces.

While in Cape Town, I have also seen the possibilities of well-centred and well-connected railway lines, and the value they can add to the urban fabric, with the activity and vibrance of stations such as the Wynberg and Fish Hoek Stations.

Figure 4: The author at a train station (Source: Author, 2024)

Situating the Project

The railway line between Gqeberha and Kariega (then Port Elizabeth and Uitenhage) was completed in 1875 and was for many years the primary movement route for people and goods between the two towns (Martin, 2017).

As the road network improved in the country, there was disinvestment in rail infrastructure, and over time the system has fallen into disrepair and has lost relevance. (*Ibid*.,2017) Since the 1940s, the only major change to the line has been the addition of one more station (the New Brighton Station), with all the other stations remaining in the same position as they have been for over a century. This is despite massive growth of the areas surrounding the line, which includes working class neighbourhoods, industrial areas, townships, and the town centres of Gqeberha, Despatch and Kariega.

The result of these years of decay has been the low status and usage of the line - with many delays to returning it to service after disruptions, and no to very little activity outside the stations along the line.

Looking at the rail system over time and how what is now Nelson Mandela Bay has grown over time, one can see to what extent the railway line has lost relevance in terms of being positioned in a place where it would be most useful to commuters. Originally, the line was placed where it is today for two reasons: the line allowed for most of the neighbourhoods and industrial areas to be connected by the line, and by following a path along the Swartkops estuary, it maintained a very gentle gradient that would not be possible with a more direct route.

The line currently runs through 10 stations: Gqeberha; North End; Sydenham; New Brighton; Swartkops; Redhouse; Perseverence; Despatch; De Mist; Kariega.

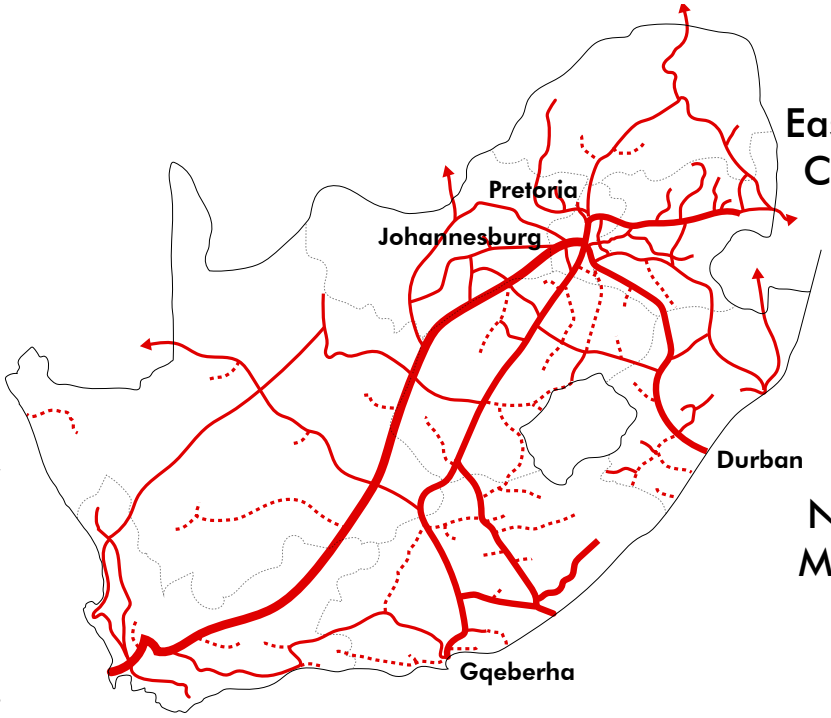

Figure 5: Understanding the rail system of South Africa (Source: Author, 2024)

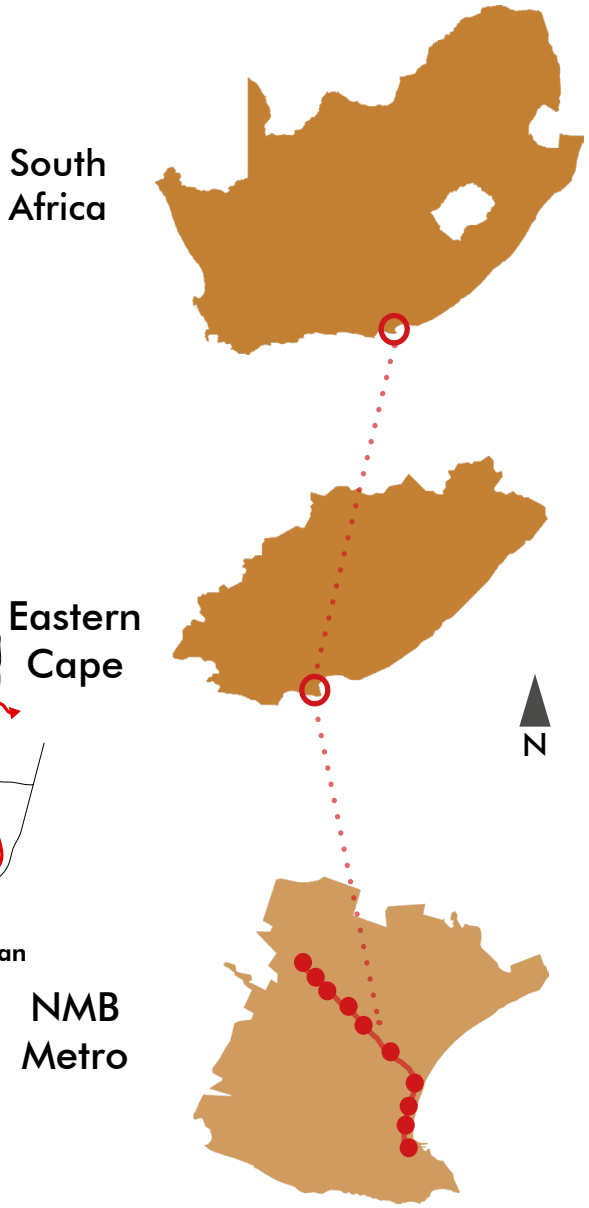

Figure 6: Locating the site within South Africa, the Eastern Cape, and the Nelson Mandela Bay Metro (Source: Author, 2024)

Figure 7: Sydenham Station in the 1950s
(Source: Paxton, c.1953)

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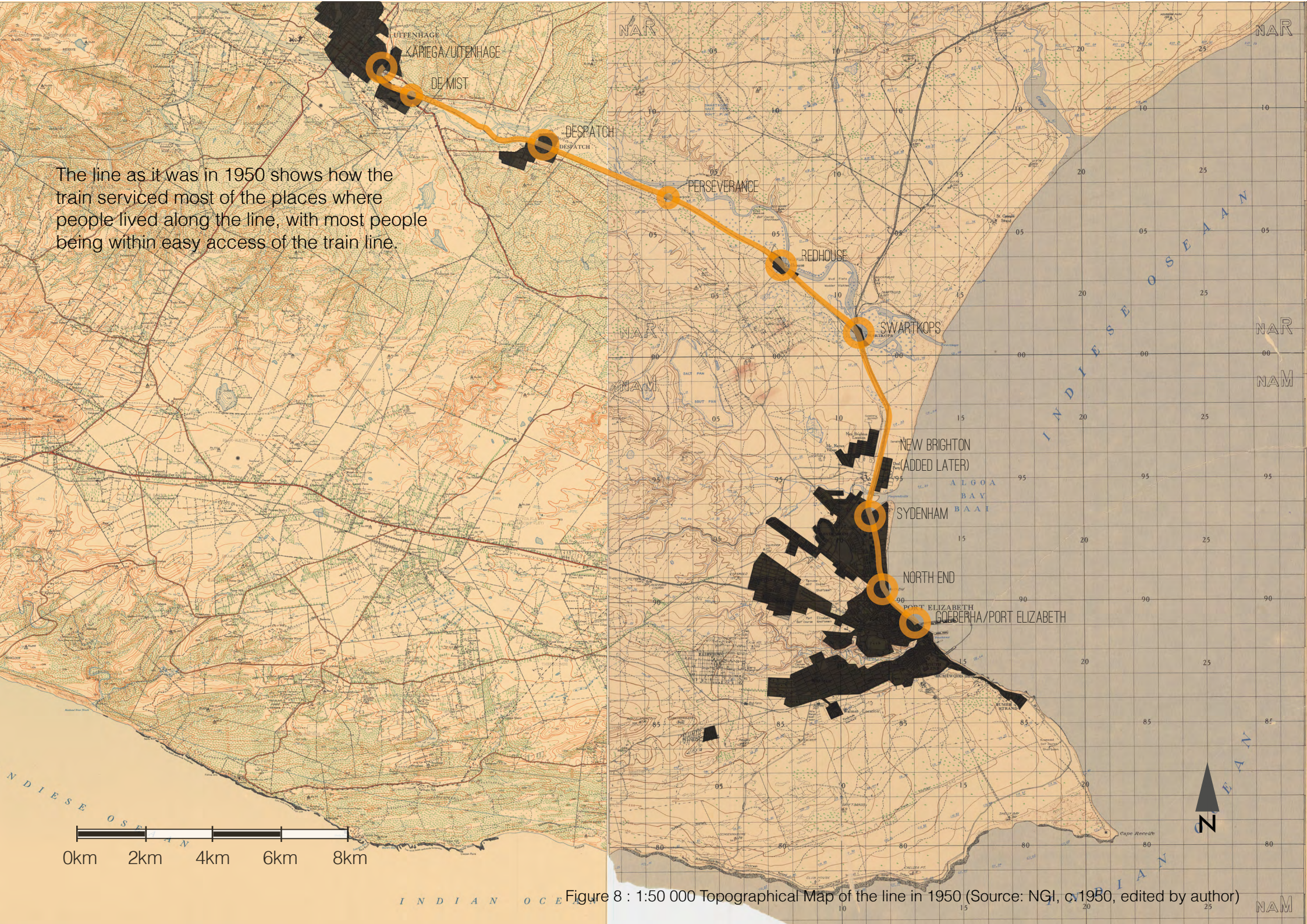


Figure 8 : 1:50 000 Topographical Map of the line in 1950 (Source: NGI, c.1950, edited by author)

1950

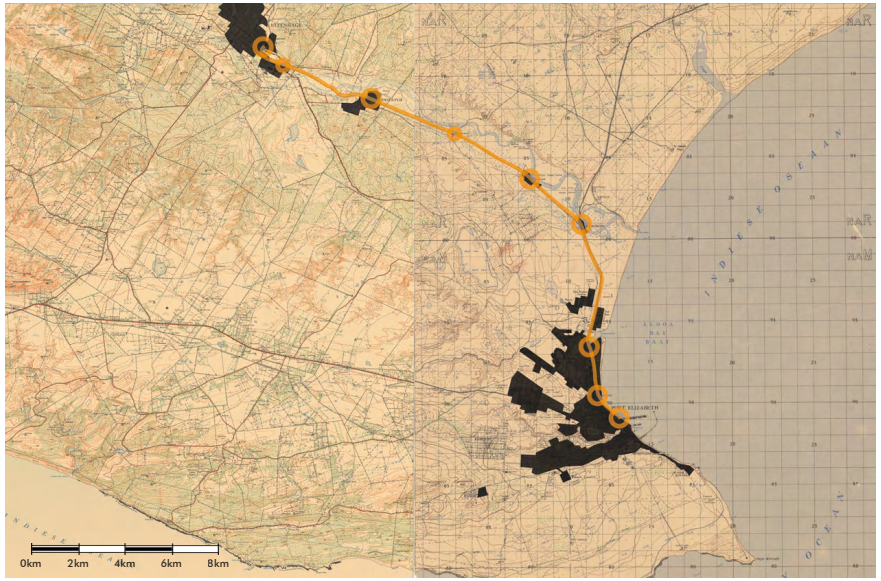


Figure 9: 1:50 000 Topographical Map of the line in 1950 (Source: NGI, 1950, edited by author)

1970

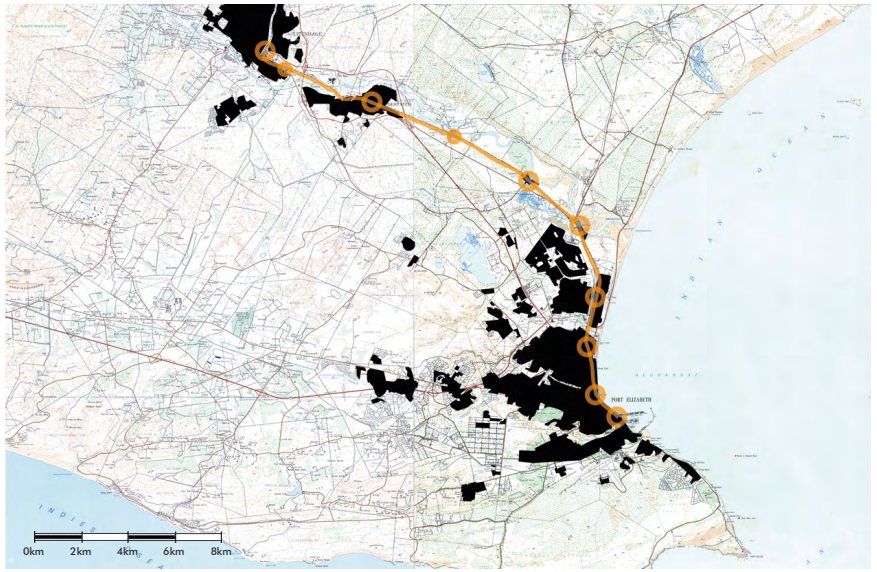


Figure 10: 1:50 000 Topographical Map of the line in 1970 (Source: NGI, 1972, edited by author)

1990

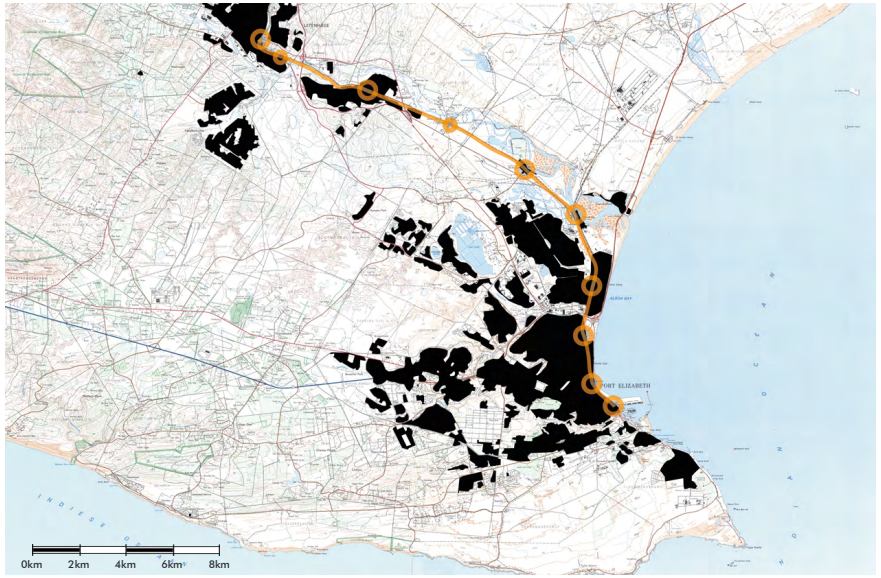


Figure 11: 1:50 000 Topographical Map of the line in 1990 (Source: NGI, 1992, edited by author)

Present Day

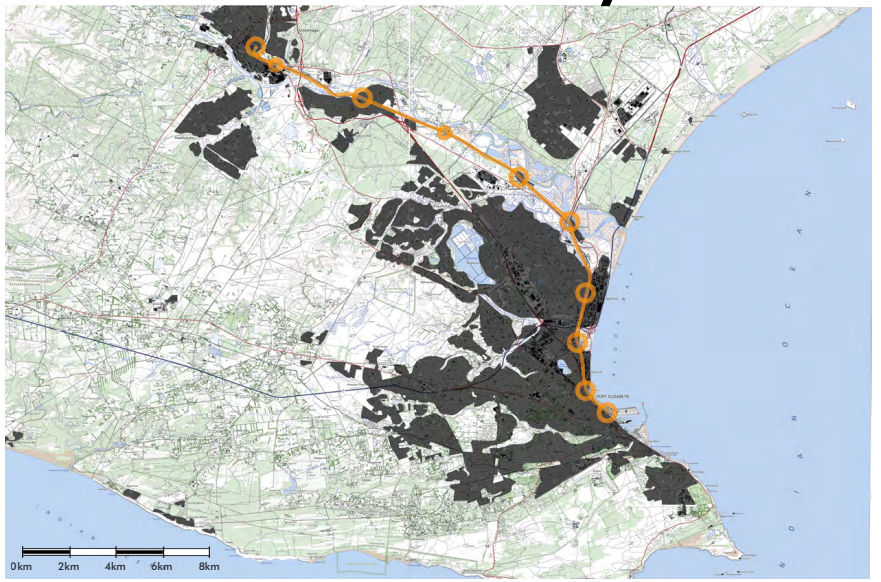


Figure 12: 1:50 000 Topographical Map of the line in the present day (Source: NGI, 2019, edited by author)

From these maps on the previous two pages, it can be seen how, in 1950, the line served its purpose of connecting people between the urban centres of Port Elizabeth and Uitehage (now Gqeberha and Kariega), and connecting the towns of Swartkops, Redhouse and Despatch along the way.

As the city grew, the amount of people living near the line, or near a station, decreased over time. A large reason for this is the fact that the areas around the stations were, according to the Group Areas Act of 1950, white areas, and most of the growth was in the townships, or areas zoned for black people to live. This, combined with the topographic limits of the railway line being set with one edge near the Swartkops River, has led to increasingly peripheral development from the stations and the line, making the line, and its stations, lose their relevance as places of convergence and movement.

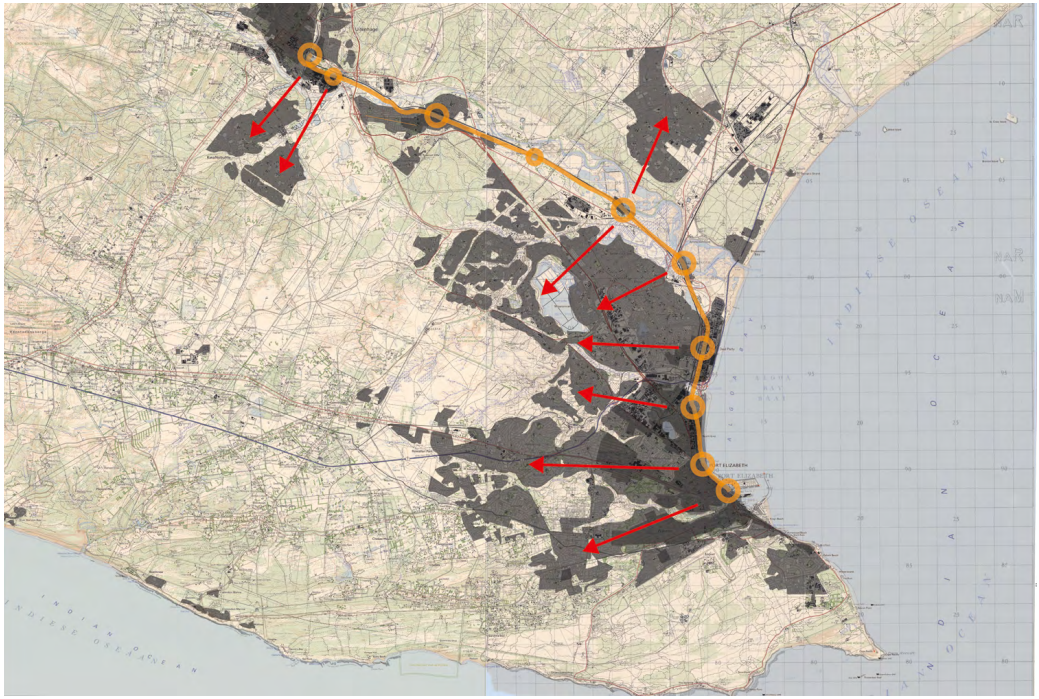


Figure 13: Interpretation map unpacking the research problem of development over time away from the railway line (Source: Author, using NGI maps, 2024)

The line has received less and less traffic, proportionally, over time, with data from the early 2000s - when the line was running far more regularly and efficiently than today - showing that the NMB Metrorail system being the least used commuter rail system in the country by a large margin - carrying less than 5000 passengers on a weekday - compared with the East London system (which is also only made of a single line and is the second smallest Metrorail system in the country) which carried 18 000 passengers on a typical weekday. (Department of Transport, 2005)

This has led to the rail system, despite it being capable of mass transit of many people in a relatively short amount of time, becoming largely irrelevant in the transportation scheme of the metro. Most people travel either by minibus taxi or by municipal bus. (NMBM, 2023)

The shortcomings of the system have been noted by both the municipal and national government, with there being proposals to re-route the line. However, these, despite many years of acknowledging the issues, have not come to fruition and do not look to be implemented in the near future. (NMBM, 2023)

Importantly, there are plans to build a rail link to the Motherwell Township, to allow for this neighbourhood, which is on the north side of the Swartkops River, and thus separated from the rest of the system, to have better access into the city and its opportunities.

Work in developing this route was on track until the Covid-19 lockdown, when it was abandoned, with the locomotives meant for this purpose now sitting in the Gqeberha Station

(Interview with security guards at the station, 2024).

The past and present importance of the Swartkops river in the rail system cannot be overstated. Due to rail systems needing to be as level as possible, the line largely follows the estuary from Swartkops to Despatch, but does not interact with this natural system in a meaningful way. The route, as laid out in 1875, was placed there for practical considerations only.

Since the rail line was placed, the large townships of Kwazakhele, iBhayi and Zwide have grown on the south of the Swartkops river. However, due to both apartheid planning practices, as well as several infrastructural and natural barriers (including a large floodplain due to the flat ground), access to the rail line is not easy for people living in these townships, making the train, even when running optimally, not a viable choice for most of the people living in these neighbourhoods.

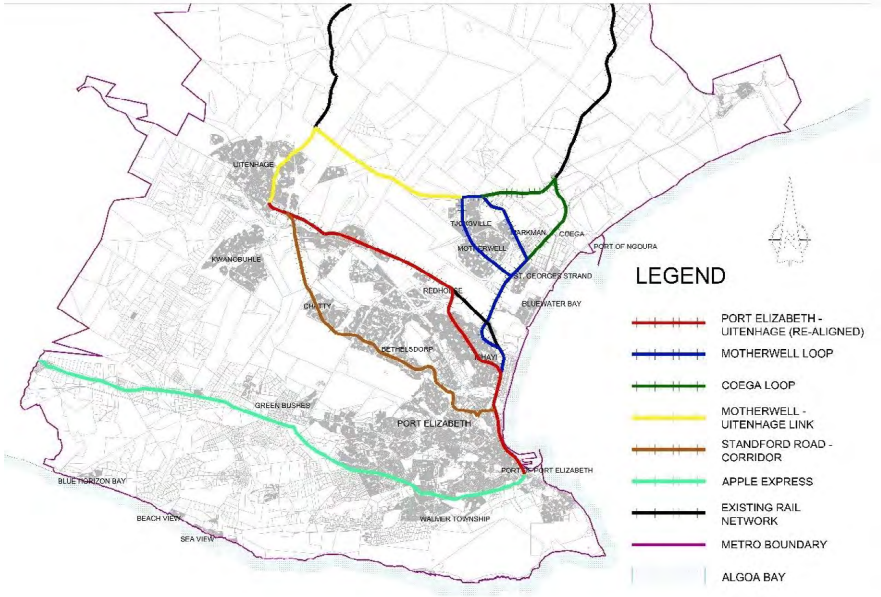


Figure 14: Current proposals as to the changes to be made to the Nelson Mandela Bay rail system, including the Motherwell Loop. (Source: NMBM, 2023)

Figure 15: A passenger train passing through the Swartkops area with the estuary to its right and the power station to its left (Source: Lewis, 1960)

Research Question

The Problem

From an analysis of the morphology of the Nelson Mandela Bay area, it is clear that development has moved away, over many years, from being centred on the railway line. Instead, the primary routes are now by road. The stations have, to a large degree, become shadows of their former selves, and do not serve the community because they are far from where the people are, and are not integrated into the urban fabric. The stations, acting as the interface where the railway line meets people, show just how unimportant the railway line is for the average commuter.

The research problem, then, becomes one of grappling with the notions of how the railway line can be re-imagined to be a catalyst for the creation of an inclusive urban environment - one that fosters the notion of spatial justice and a system that is accessible and relevant to a contemporary South African urban context.

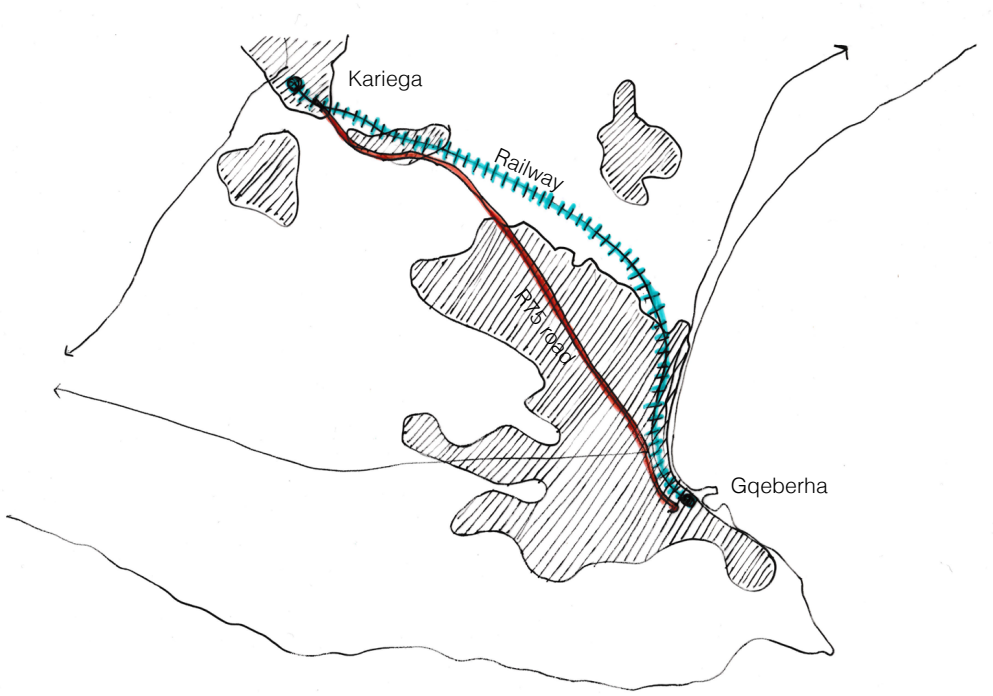


Figure 16: The arterial road between Gqeberha and Kariega is embedded in the urban fabric, while the railway line, for much of the way, clings to the periphery. (Source: Author, 2024)

The Question

How can the Nelson Mandela Bay commuter rail line be re-imagined to ensure spatial justice?

The research question tries to grapple with the idea of reimagining the railway line - not just by looking at the stations - thinking how the system as a whole can be more integrated into the urban fabric. This question is grounded in the notion of spatial justice and overcoming the Modernist and apartheid planning policies that have shaped South African cities over the past decades.

The re-imagining of the line does not necessarily mean that the intervention or interventions end or start with the line - the urban fabric needs to be integrated with the line to allow for the easy movement of people, and for the railway line to not be a barrier to people experiencing the natural system of the Swartkops River.

In grappling with the ideas, a series of models were built to create a visual artifact that grapples with the notions of connection, rejuvenation and integration - to understand the research question and problem from a more principle-based perspective - and to aid in the process of understanding this process of re-imagination.

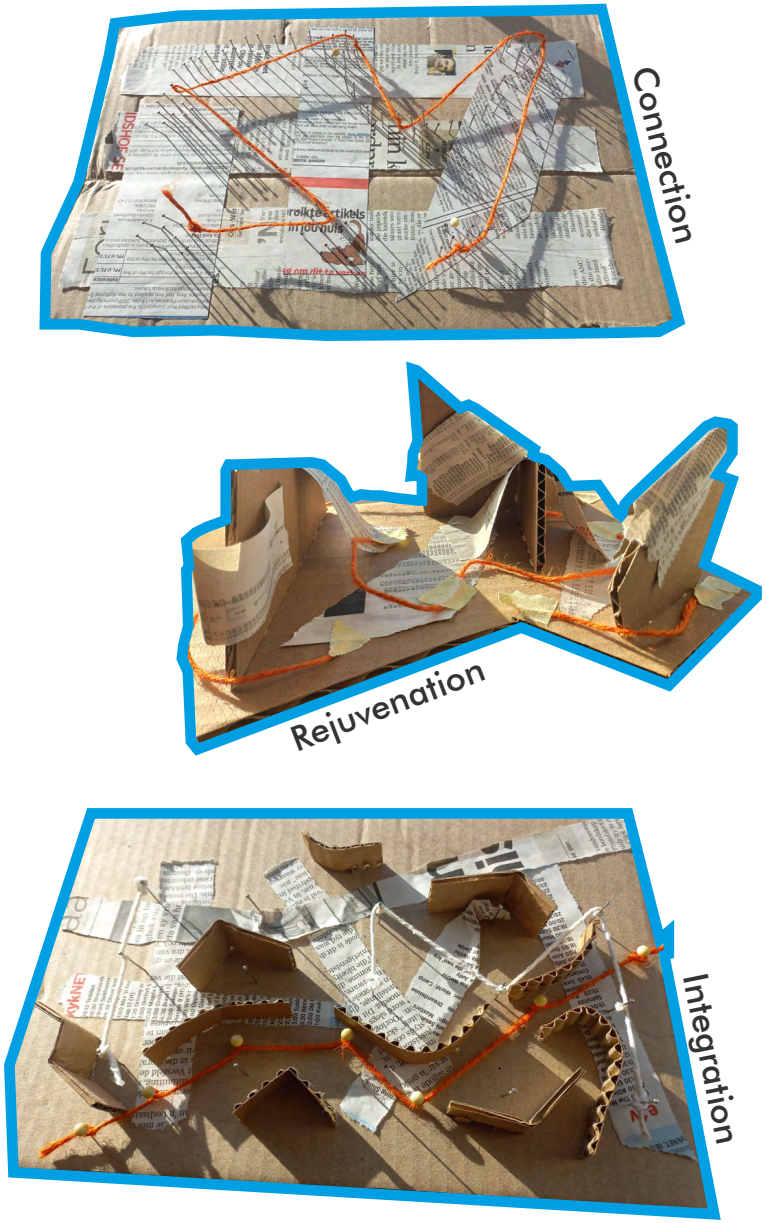


Figure 17: The three artifacts created helped to clarify the research question and some words associated with the project in order to gain clarity (Source: Author, 2024)

Aims and Objectives

The project aims to navigate ways in which the role of the railway system in Nelson Mandela Bay can be integrated into a system which has essentially become a post-railway city which is no longer reliant on the railway system for the vast majority of its transportation needs.

The project aims to develop, through an urban design project, a more integrated railway system to the surrounding urban fabric, and in doing so, ensuring spatial justice in a city still very much bound to the Apartheid-era boundaries.

The project aims to create and strengthen corridors of activity between the railway line - and the main movement corridor or corridors that have essentially replaced the original purpose of the rail line - the arterial routes that now carry the taxis and buses and cars.

The aim of connecting people to the natural systems in the metro, and ensuring that spatial justice of connection to, especially the Swartkops River system is achieved, is crucial in ensuring that spatial justice is not seen as only an issue of access to economic benefits.

Through this, the role of the railway line, and its connection to the urban, will be reinvigorated, and the line will gain a degree of prominence and importance again in the hierarchy of the urban structure. This is envisaged to act as a catalyst and “pull-factor” in the development of the metro.

The objectives of the project are as follows:
To develop a contextual framework for the entire area of study - Nelson Mandela Bay
To develop a urban design framework plan for the focus area - Swartkops precinct
To design interventions at the site scale that address the issues contemplated in the research problem, namely, to re-imagine the way in which the urban fabric, railway system, and natural system interact.
To develop a set of principals and design guidelines to implement the urban design framework.

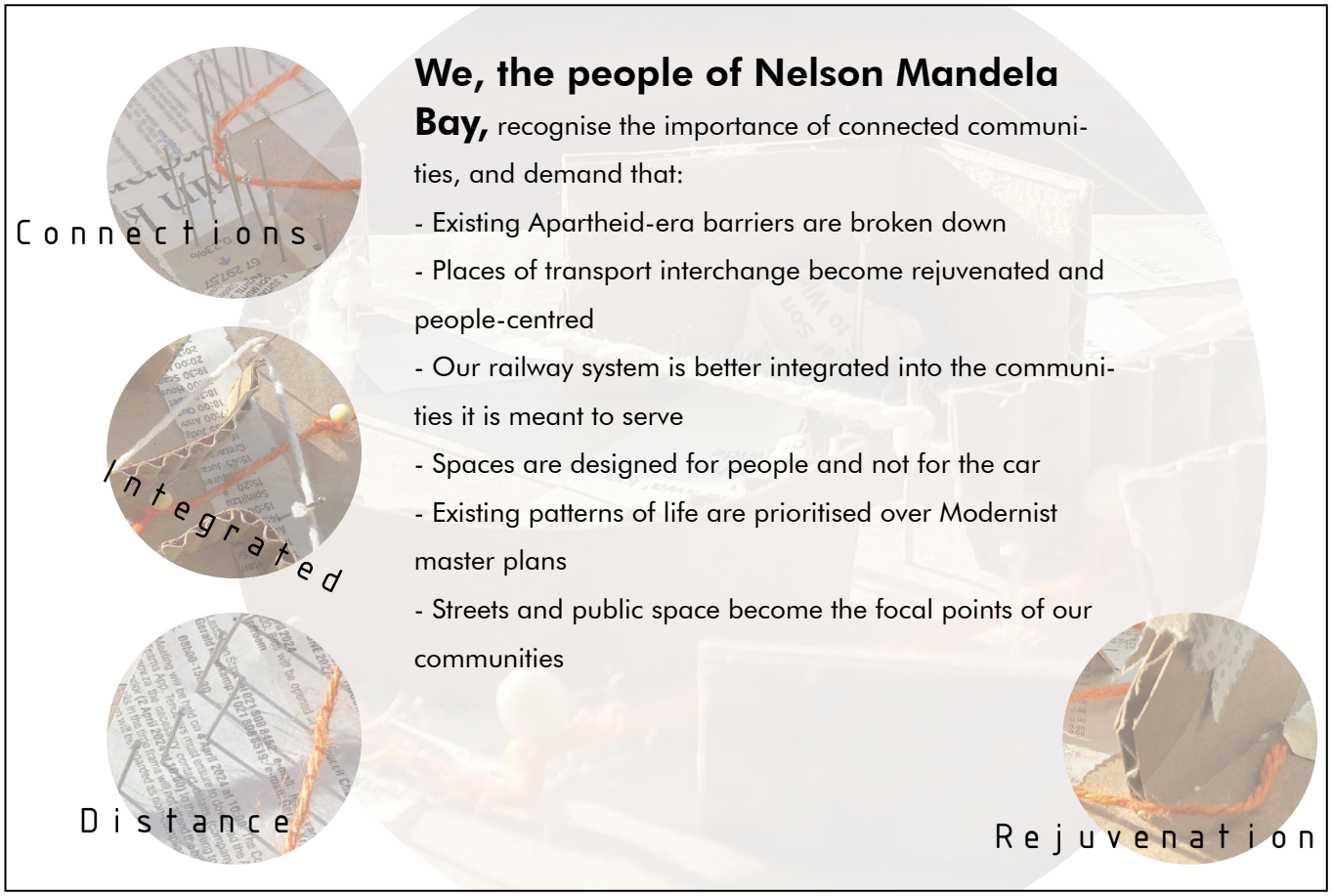


Figure 18: The aims of the project re-framed in the form of a political-type manifesto - as an aid to clarifying the aims of the project (Source: Author, 2024)

Methodologies

This section provides an outline of the methodology followed in doing the research, as well as the methods employed. Qualitative investigation techniques were used to gather the information required for the research: non-participant observation, semi-structured interviews, social mapping, historic mapping, and experiential site visits. Use was also made of precedent in gaining an understanding of relevant and similar situations, in informing a design response.

The methods used were chosen specificially in order to understand the context in terms of the research problem and research question, in order to gain an understanding of the people, natural systems and heritage on the site, which, along with desktop contextual analysis, influenced the contextual framework, which in turn fed into the framework for the Swartkops area. Integral to the final design response were the inferences drawn from the methodologies used in order to deliver an appropriate, and well-considered design response.

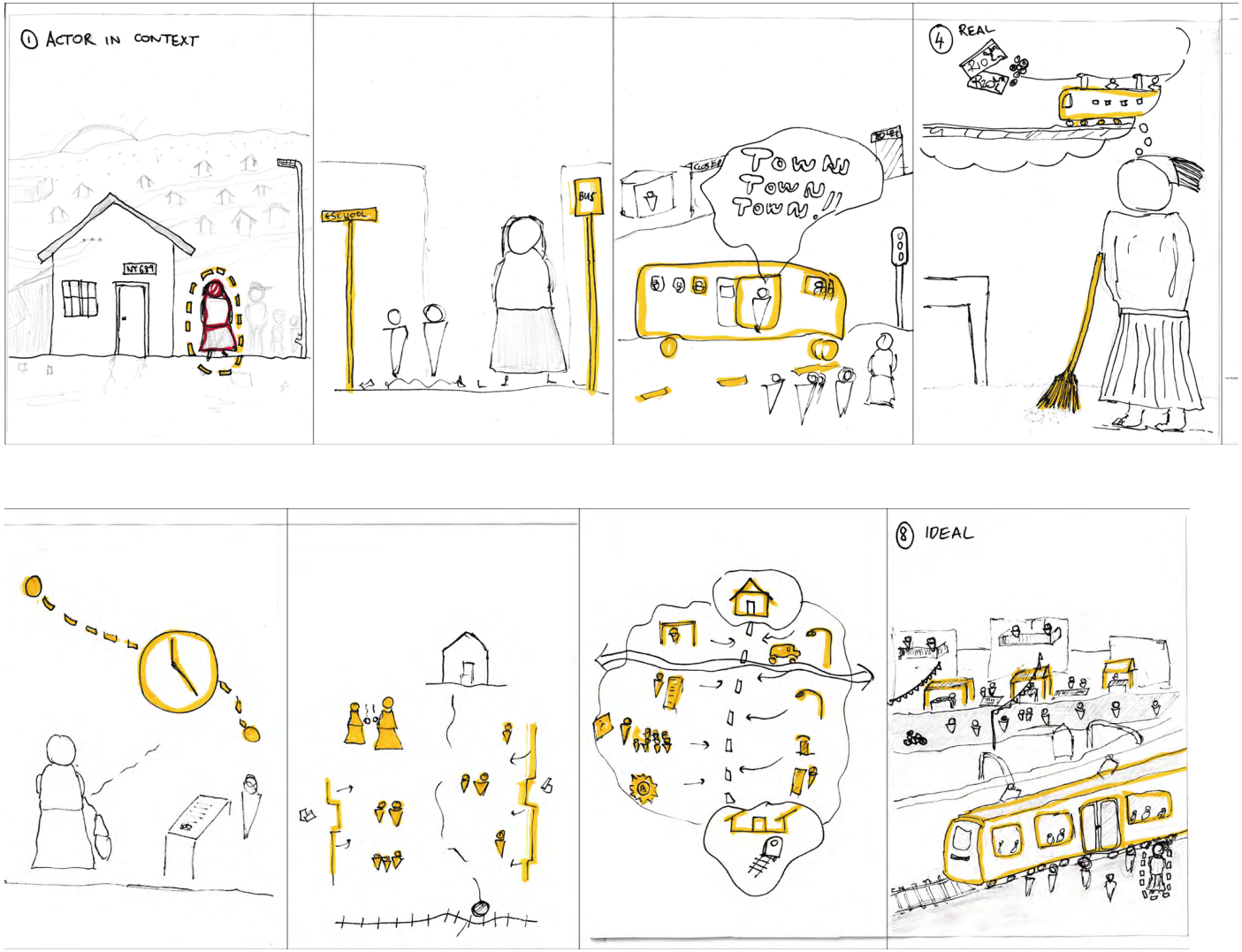


Figure 19: By imagining a person in the project's specific context through the Active Participant exercise, the non-participant observation and semi-structured interviews were developed. The exercise goes through imagining a fictional character, and how she/he goes about their day. In this case, the character was Elizabeth, a lady living in the Kwazakhele township, who words as a cleaner in Gqeberha. She spends much of her money on taxi fare, and has to walk through an unsatisfactory urban environment to get to the taxi. She dreams of a lively street where she could catch the train (which is much cheaper) and where she would see her friends, be able to buy some groceries, and feel safe, on the journey to and from work by train. (Source: Author, 2024)

Non-Participant Observation

The Method

Much can be learnt from a space based on how people use it through observation. This method is useful in that it allows one to see how a space is used without any outside influence. This method allows an understanding of a space to be gained based not on the space itself, but based on how people use the space. The lack of people in a space is just as (or more) telling than a space full of people - there is nearly always a reason why people prefer one route or space to another.

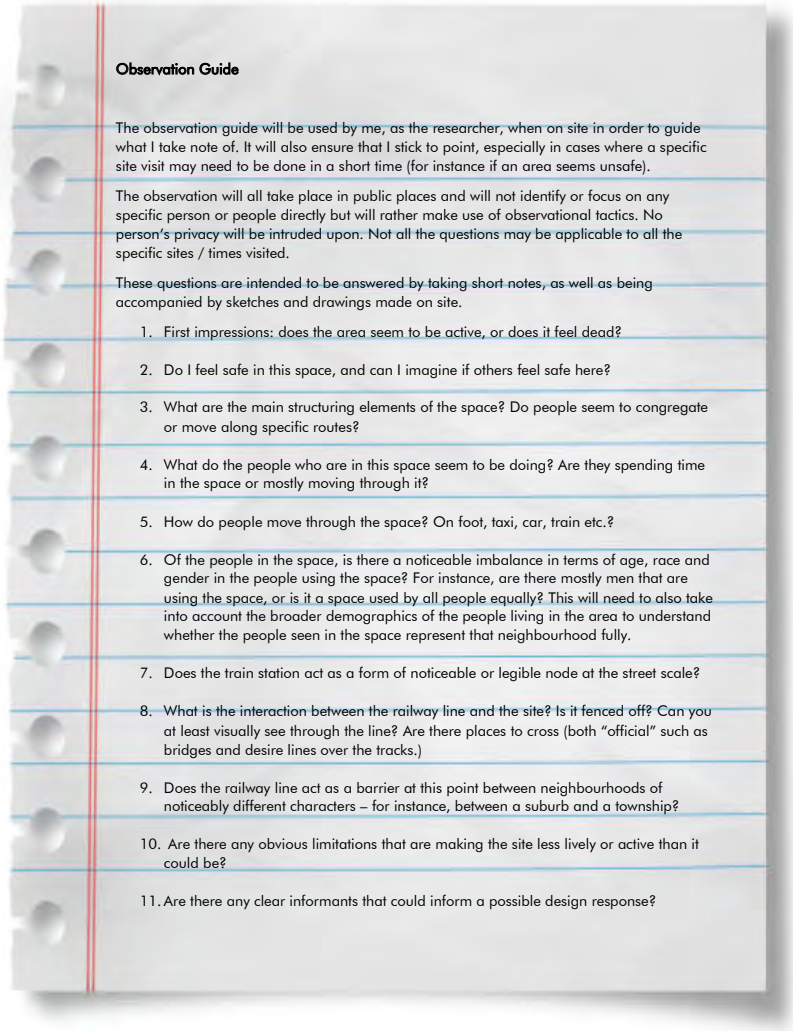
Why is this method used in the project?

This method was used in the project to gain an understanding, first and foremost, of the level of activity at the stations and surrounding areas. It was used as an easy way to get information about the life and activity (or lack thereof) around the railway stations.

How is this method used in the project?

This method was used for two purposes in the project. The first was to see how people move, linger, and spend time in the spaces being observed - the railway stations and their surroundings. This method was also useful in getting a first impression, from a researcher's perspective, of the sites being observed. This method allowed an understanding of how people use the space, and to draw inferences on people's general behaviour - how safe do people feel, what is the age and gender balance of people using the space, and things such as whther the space seems clean and well-used, or whether it is neglected and decaying.

Specifically for the project, there was a lot of value to be gained in seeing which stations and areas were most used in comparison to others - with this method being integral to getting this data. This method is also used in conjuction with the social mapping method in order to gain data of how people use space, interpreted spatially.



Observation Guide

The observation guide will be used by me, as the researcher, when on site in order to guide what I take note of. It will also ensure that I stick to point, especially in cases where a specific site visit may need to be done in a short time (for instance if an area seems unsafe).

The observation will all take place in public places and will not identify or focus on any specific person or people directly but will rather make use of observational tactics. No person's privacy will be intruded upon. Not all the questions may be applicable to all the specific sites / times visited.

These questions are intended to be answered by taking short notes, as well as being accompanied by sketches and drawings made on site.

1. First impressions: does the area seem to be active, or does it feel dead?
2. Do I feel safe in this space, and can I imagine if others feel safe here?
3. What are the main structuring elements of the space? Do people seem to congregate or move along specific routes?
4. What do the people who are in this space seem to be doing? Are they spending time in the space or mostly moving through it?
5. How do people move through the space? On foot, taxi, car, train etc.?
6. Of the people in the space, is there a noticeable imbalance in terms of age, race and gender in the people using the space? For instance, are there mostly men that are using the space, or is it a space used by all people equally? This will need to also take into account the broader demographics of the people living in the area to understand whether the people seen in the space represent that neighbourhood fully.
7. Does the train station act as a form of noticeable or legible node at the street scale?
8. What is the interaction between the railway line and the site? Is it fenced off? Can you at least visually see through the line? Are there places to cross (both "official" such as bridges and desire lines over the tracks.)
9. Does the railway line act as a barrier at this point between neighbourhoods of noticeably different characters – for instance, between a suburb and a township?
10. Are there any obvious limitations that are making the site less lively or active than it could be?
11. Are there any clear informants that could inform a possible design response?

Figure 20: An observation guide was used to guide what was noticed at each place in order to gain an overall understanding (Source: Author, 2024)

Semi-structured Interviews

The Method

Semi-structured interviews are used to get the thoughts and experiences of people, through more than just observation. Semi-structured interviews are more like a conversation than a strict interview using set questions, and allow interviewees to open up about aspects that they want to talk about, such as anecdotes and stories. The use of an interview guide allows the conversation to remain relevant to the project, while having enough flexibility to allow personal viewpoints and anecdotes to be added, adding to the richness of the data collected.

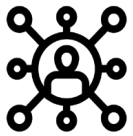
Why is this method used in the project?

This method was an important one in understanding differing views on, for instance, why some people use the train and why some don't, or prefer not to. Given the historic nature of the railway line, this method also allowed people to give anecdotes of experiences that happened in the past, or to someone they know. By asking people for their views and experiences, non-visible traces and aspects of sites are able to be picked up on, which are not possible simply through observation or other methods such as mapping.

How is this method used in the project?

This method was used in the project to get the viewpoints of members of the public, and was done through approaching people near or at various sites near the railway stations. In addition to this, workers, including security guards and ticket salespeople, were also engaged with to better understand the situation around stations, and to get their insights into understanding the spaces.

Social Mapping



The Method

Social mapping is a useful tool to spatialise the use of space and get an understanding of how people use spaces. It allows insights that are not possible with just observational analysis. Social mapping has the power to inform design decisions through an understanding of how people inhabit and move through space, and is a useful method to use in conjunction with non-participant observation.

Why is this method used in the project?

The method was used to gain an understanding of how people move through the railway stations and in the surrounding areas. Specific routes and areas of concentration of social activity and movement are able to be highlighted - with informants leading to a more in-depth understanding of the precincts and areas of interest. An understanding of where people are currently and where people travel from and to is a valuable informant in deciding where to place interventions and design responses.

How is this method used in the project?

This method was used, initially, to get information on the movement patterns of people at stations, as well as how people move between stations using the train. This method, done at both the individual railway station scale and at a larger system scale analysis, was able to inform and strengthen the arguement for the area of focus - the Swartkops precinct.

Historic Mapping

The Method

Historic mapping entails finding old maps, plans and photographs and piecing these together to become valuable design informants. By utilising this method, reasons for why things are currently as they are can be understood through a historic lens, and trends over long periods of time become evident. Historic mapping can also be used to pick up traces of past history that are no longer evident in the present day.

Why is this method used in the project?

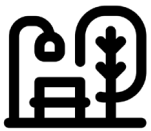
This method was used to gain an understanding of the historic aspects that have led to the current situation - how a historic railway line lost its significance - and to pick up on historic traces that influenced the positioning of the line and the surrounding urban fabric.

How is this method used in the project?

This method was utilised by analysing historic topographic maps of the metro over time, and looking at the development of the urban morphology.

Furthermore, the use of historic photographs was utilised to understand the way in which some of the spaces were used in the past, and to understand the transition that has occurred, in the process of identifying the informants and constraints of the system.

Experiential Site Visits



The Method

Linked to all of these methods, is the method of experiencing the site firsthand. The use of experiential site visits acts as a way to bring all the other methods together.

By incorporating experiential site visits, many aspects are able to be picked up on that would not be possible through desktop research or through the other methods.

Why is this method used in the project?

This method was used in the project to bring in a deeper, real-world experience of the research area. This allowed for a series of first impressions of the research area, as well as providing a feeling of the research area. It also provided a platform through which the methods of semi-structured interviews and non-participant observation could be carried out - becoming a part of the space and interacting with the people in the space.

How is this method used in the project?

This method was used in two specific ways relevant to the project: firstly, it involved experiencing the sites of the stations and their surroundings, gaining impressions, taking notes and photographs, and incorporating the other abovementioned methods.

Secondly, towards the end of visiting all the stations, came the process of taking the train for a trip along the length of the line, experiencing it, the natural landscape it runs thorough, the people getting on and off, and the train itself.

Through combining these two types of experiential site visits, this method was able to provide valuable data in the process of re-imagining the system.

Figure 21: The walk from the town square to the station in Gqeberha (Source: Author, 2024)

FRAMING

Theoretical Framework

The project is one that is, at its core, one based on the values of spatial justice, as viewed through the lens of Soja (2008). The issue of spatial justice presents a way to look at the idea of social justice through a spatial lens, which is crucial in the understanding of South African cities. South African cities are places with many issues stemming from modernist and apartheid planning practises (Dewar and Uytenbogaardt, 1991). This has resulted in South African cities being very spatially unjust places, and ones that are characterised by the principles of separation – of people, activities and movement (Ibid., 1991).

Soja (2008) has a great focus on the territoriality of justice – social justice, in his mind, needs to be become territorialised in order to become real. His concepts are ultimately underpinned by Lefebvre's notion of the right to the city.

This research project, in looking at the way a railway line is integrated into the urban fabric, including how it integrates with other modes of transport, draws on the work of Warnich and Verster (2004) in looking at the notion of corridor development. They note the potential of corridor development as a potential remedy to many of the spatial challenges in Cape Town. The principles, however, are relevant to all large South African cities. Their notion and interpretation of corridor development sees the idea of an activity corridor linked by nodes. At each node is an activity street running perpendicular to this node, which leads to a "local node." These principles can be crucial in re-conceptualising the railway line as one that stands in relative isolation, to one that is integrated into the urban fabric - without, necessarily, moving the position of the actual railway line.

In order to achieve spatial justice, it can be useful to apply Soja's lens through that of Dewar et al (1991), where they describe the qualities of quality urban environments and cities. These qualities, which are desirable in all cities, include meeting the needs of people, which are then developed into a series of programme, which lead to a series of ideas, which in turn leads to consideration of context.

Dewar et al (1991) consider issues of access to be crucial to the idea of urban generation – urban generation being the synergy that occurs from having many people in one place – the very reason for cities existing in the first place. Without access, they note, urban generation cannot thrive to its full potential.

They go on to note the importance of places of collective activities and contact – public places and spaces – both formal and informal – where interaction occurs. This interaction strengthens innovation and diversification in the city. They note, however, that these things cannot happen without equity being in place – which is where their writings coincide with that of Soja. Dewar et al (1991) notes that the

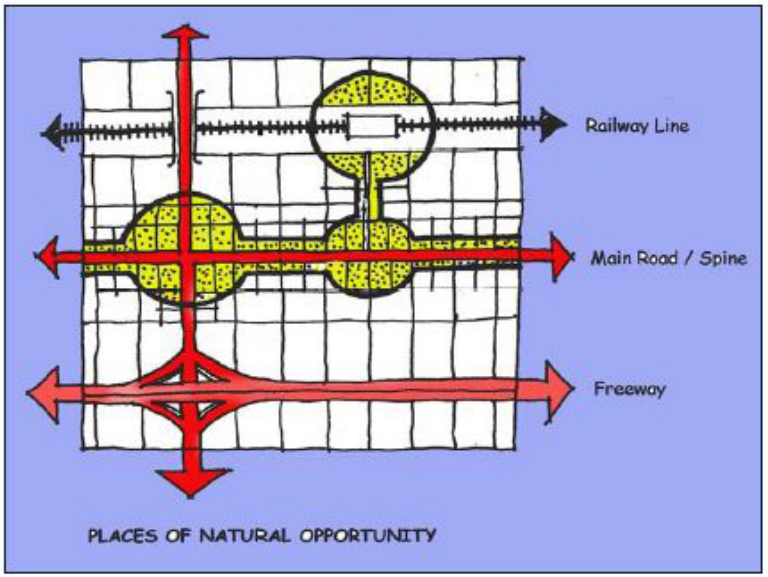


Figure 22: Looking at the possibility of corridor development principles in the Nelson Mandela Bay context (Source: Warnich, 2004)

Figure 23: South Africa remains a spatially unjust country (Source: Time, 2016)

apartheid city plan has made the lack of equity very clear.

Soja provides a solution to this, in recognising that by taking the socio-spatial dialectic seriously – in other words, by recognising that our spatial environments have an effect on us for better or for worse, we can make the necessary changes to ensure that the quality urban environments Dewar et al (1991) speak of, can be realised, thus creating a society that is spatially just. Mostafavi (2010) provides a lens through which one can view a potential re-structuring of urban space, through ecological urbanism.

At its core, ecological urbanism is one in which a paradigm shift has occurred in that the architecture of an urban space (its buildings and streets) is not the initial structuring element in the space, but rather, the natural systems take precedence (Ibid., 2010). Mosafavi goes on to note that it is crucial that this shift occurs in order to address the mounting challenges faced by the world's natural systems. Ecological urbanism provides "a set of sensibilities and practices" to enhance approaches to urban development – through both new and existing means. Mostafavi uses as a valuable example both the projects of the Promenade Plantee in Paris and the High Line in New York City as examples of railway lines that have been transformed as an urban park. This is the result of strong juxtaposition and contrasts, which lends the projects their strengths (Ibid, 2010). The result, he notes, is a relational approach, in which buildings and structures (particularly industrial structures) become the contextual grounding a framing of something new – of a focus on the ecological aspect.
Importantly, this approach, while

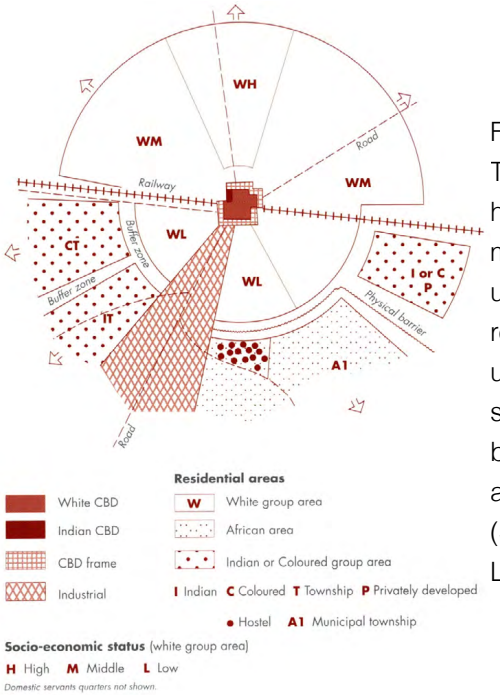


Figure 24: The apartheid city model was used to segregate, often using infrastructural barriers such as rail lines (Source: Louw, 1987)

emphasising the importance of nature and an ecological focus, does not encourage an approach where the existing structures are demolished and the site returned to its original, untouched state, but one in which the existing is adapted in order to be more ecologically sensitive.

In the hopes of creating a more spatially just city, using Soja's notion of spatial justice, the concept of ecological urbanism provides a potential bridge as a method of approaching ways to improve the quality of the South African urban environments, using Dewar et al.'s (1991) principles for developing a more just and spatially equitable urban landscape.

Case Studies

Throughout the world, numerous railway lines that are no longer in use, or which no longer have the importance they used to, have been re-imagined into something else: spaces for people and nature, while still maintaining functional or heritage elements of the past.

These case studies look at case studies that touch on similar topics to the Gqeberha - Kariega railway line: how the line itself can be re-imagined, how rail infrastructure can be re-imagined, how large industrial buildings (such as the Swartkops Power Station) can be re-imagined, how movement corridors can be re-imagined and lastly how railway stations themselves can be re-imagined.

These case studies lead to informants for a design response at a framework and focus area scale, in re-imagining the Nelson Mandela Bay commuter rail line and towards fostering spatial justice.

Re-imagining a Railway Line

A case study of the Charlotte Rail Trail (Virginia, USA)

The Charlotte Rail Trail in Charlotte, Virginia, USA, re-imagines a former rail corridor as a people-centric space, made up of several, phased projects, including public artwork, cyclist linkages, restaurant spaces and public spaces. All these interventions are implemented according to a phased framework plan.

The project is relevant as a case study in understanding strategies in re-imagining a railway line as a people-centric place rather than (just) an infrastructure corridor for trains.

Figure 25 (above right): The Charlotte Rail Trail re-imagines the role of a railway line and its surroundings (Source: CRT, 2016)

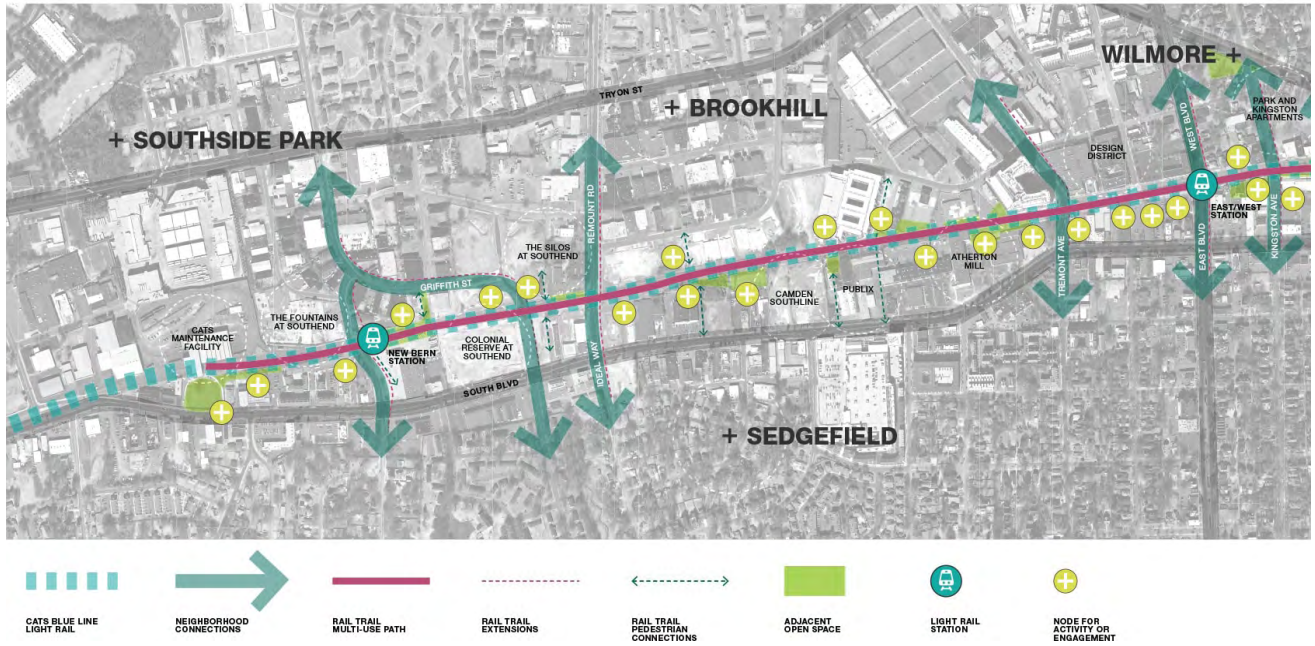


Figure 26 (right): The rail trail project considers connections to the surroundings through a series of catalytic projects (Source: CRT, 2015)

Re-imagining a large industrial building

A case study of the Athlone Power Plant, Cape Town

The Athlone Power Plant is a largely abandoned power plant in Cape Town. It was a coal-fired power plant, which stopped operations in 2003, and has been earmarked for development, as it is well located and includes 36 hectares of land. Plans for its redevlopment are still in early phases but there are proposals for a training centre, conversion to a commercial or industrial precinct, and a multi-use media centre. (City of Cape Town, 2023)

This project has relevance given the programmatic similarity to the Swartkops Power station, and its associated site. However, the Athlone power station is in a more integrated urban environment than the Swartkops power station.

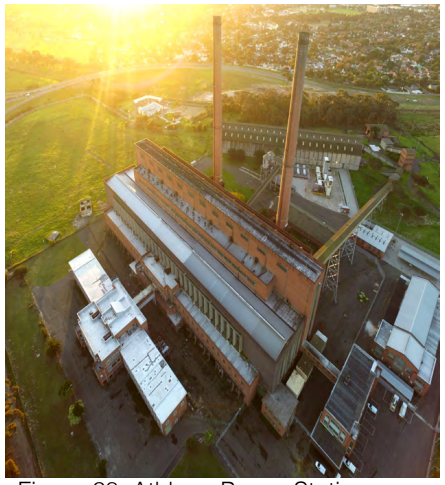


Figure 28: Athlone Power Station (Source: COCT, 2023)

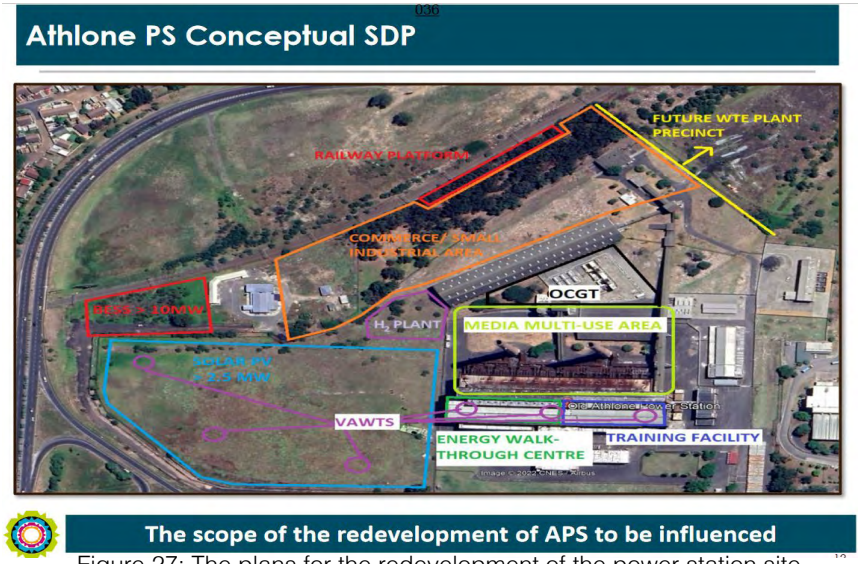


Figure 27: The plans for the redevelopment of the power station site (Source: COCT, 2023)

A case study of the Zollverein Coal Mine Complex

Figure 29: Part of the old coal mine complex re-imagined as a winter ice rink (Source: Lorenz, 2019)

The Zollverein Coal Mine complex in Germany is a UNESCO World Heritage Site, and has been re-imagined as a cultural node celebrating the industrial heritage of the site. Instead of trying to hide the industrial aspects of the complex, these aspects are celebrated, and these former industrial installations and machinery become powerful spaces of gathering and culture.

This project has relevance in its handling of a very large, industrial building, and its sensitive treatment of a building with important industrial heritage, an often-overlooked aspect of heritage.

Figure 30: Part of the old coal mine complex re-imagined as a pool space (Source: Lorenz, 2019)

Re-imagining Infrastructure

A case study of Stimela: The Re-urbanisation of a Ghost Train Station" (UJ M.Arch Thesis - Linda Lesolle)

The Stimela project looked at the possibility of radically re-imagining a piece of abandoned rail infrastructure - a station which had become a self-built neighbourhood - through the provision of services and a strategic integration of the old transport infrastructure into a new, social-based lens. The end result is one in which human rights are dignified, and abandoned infrastructure is given a new life as housing and a social space.

The project is relevant in understanding the potential of radical ways of re-imagining infrastructural elements such as rail lines, and how to use these to further spatial justice, and break down barriers.

Figure 31: The project looks at radically transforming a space not originally designed at a people-scale into a space for people (Source: Lesolle, 2021)

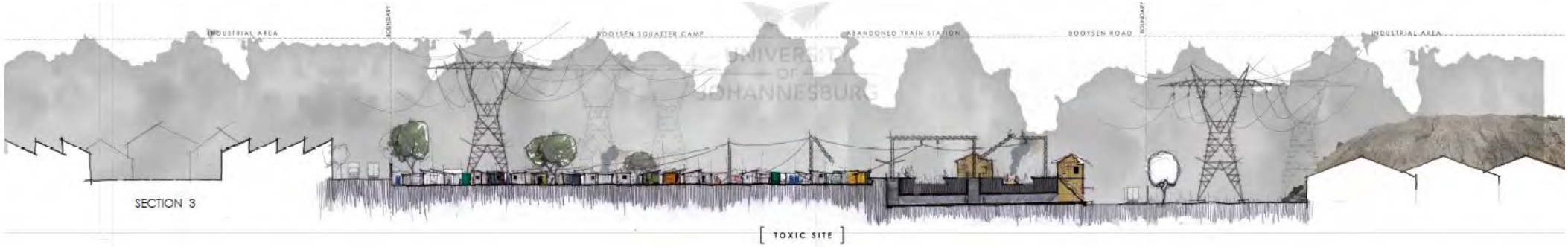


Figure 32: Integration with the surrounding urban fabric is taken into account, as is making use of the existing infrastrutural elements on site to retain elements of the character of the space (Source: Lesolle, 2021)

Re-imagining a Railway Station

A case study of Blue Downs Station, Cape Town

Figure 33 (left): The integrated station precinct (Source: GAPP, 2022)

Figure 34 (right): The framework plan for the station precinct (Source: GAPP, 2022)

Figure 35 (below): Street sections in the station precinct showing the human scale throughout (Source: GAPP, 2022)

The Blue Downs Station, a proposal by GAPP Architects, re-imagines the role of a station, by creating it as an integrated urban node featuring mixed-use activities, and fitting into the broader urban fabric through a framework plan.

This project is relevant in understanding the possibilities of what a re-imagined station precinct could become, and how it can be better integrated into the urban fabric.

Figure 5: Blue Downs Development Framework- Precinct scale

Figure 36: Swartkops Station on a winter evening (Source: Author, 2024)

UNDERSTANDING THE SYSTEM

Understanding the System

The train line between Gqeberha and Kariega sits as part of the national railway system, linking Gqeberha to both Johannesburg (the most-used line) and to Cape Town (which is not used very often). Both these routes pass through Swartkops, after which the line divides. The national rail system is mostly used for freight, with very few long-distance passengers. The White Paper on National Rail Policy (2022) seeks to re-imagine rail as the backbone of the freight and passenger movement systems in South Africa by 2050.

Nelson Mandela Bay is one of eight metropolitan areas in South Africa, being comprised of the former separate municipalities of Port Elizabeth (Gqeberha), Uitenhage (Kariega) and Despatch. (Nelson Mandela Bay Municipality, 2024)

The metro consists of approximately 1,5 million people, most of whom live in the metro's townships. (StatsSA, 2011)

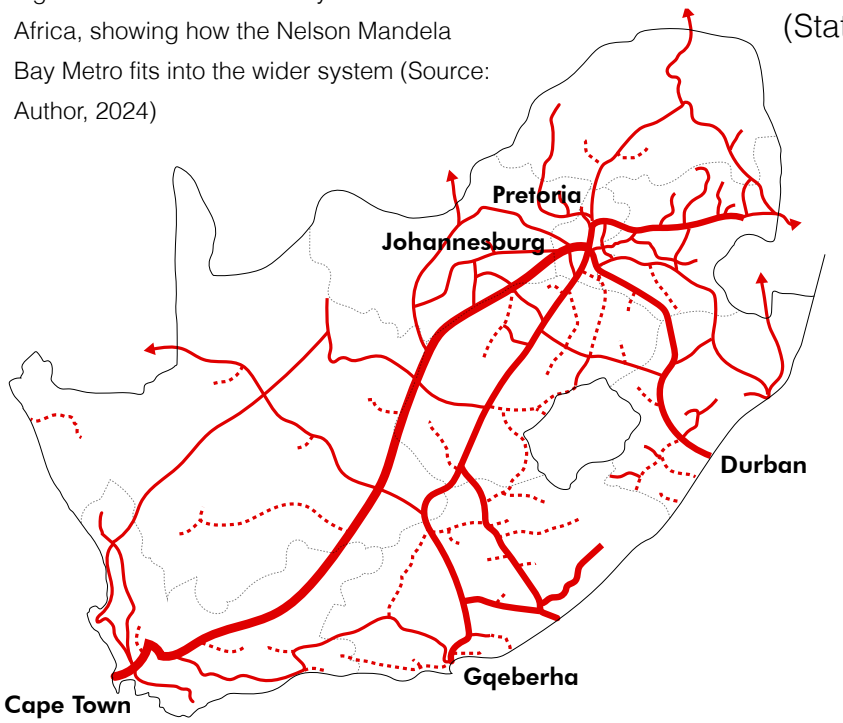


Figure 37: The national rail system in South Africa, showing how the Nelson Mandela Bay Metro fits into the wider system (Source: Author, 2024)

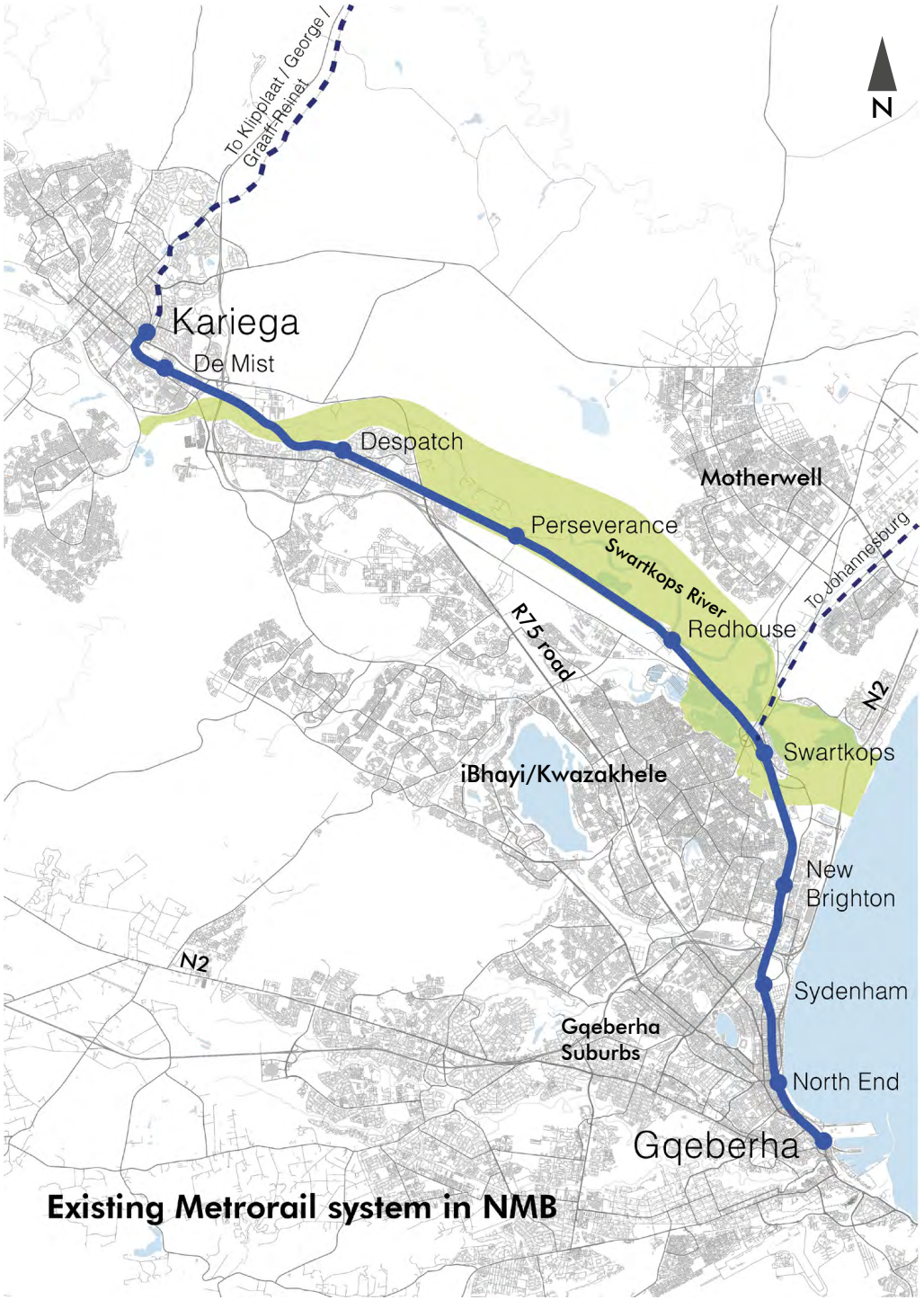


Figure 38 (right): The Nelson Mandela Bay metro and the existing Metrorail line and stations (Source: Author, 2024)

Findings: Forgotten Stations

Figure 39: Gqeberha Station (Source: Author, 2024)

Figure 40: Redhouse Station (Source: Author, 2024)


Figure 41: Despatch Station (Source: Author, 2024)

Figure 42: Sydenham Station (Source: Author, 2024)

Figure 43: Perseverance Station (Source: Author, 2024)


Figure 44: De Mist Station (Source: Author, 2024)


Figure 45: New Brighton Station (Source: Author, 2024)


Figure 46: Swartkops Station (Source: Author, 2024)

Figure 47: Kariega (Source: Author, 2024)

Findings

Experiential site visits formed an important aspect of the data collection. Each station was visited (at various times of day when possible). The overarching first impression was one of desolation. The stations were not areas of activity, but seemed to be areas of desolation, only enlivening for a brief few minutes before and after the once-daily (per direction) train arrived.

The stations were generally neglected, with much evidence of vandalism and theft of roof sheeting, metal fixtures, and fencing. At New Brighton Station, the entire station building has been demolished by vandals, leaving only a shell of the building. The platform roof has also been completely removed, leaving people exposed to the elements.

Upon speaking to the commuters, but also to security guards and ticket salespeople, it became apparent that there are lots of issues currently facing the system. These include the fact that there is only a single diesel locomotive available for the line, which means that there is only able to be one train in the morning (from Kariega to Gqeberha) and one in the evening (in the opposite direction). Due to vandalism during the Covid-19 lockdown, the system was also suspended twice due to damaged infrastructure. All stations were operational to some degree, except Perseverance Station (at which the train didn't stop). Minor repairs and upgrades were being undertaken at Despatch and De Mist Stations.

Figure 48: As part of the experiential site visits method, discarded train tickets were collected to see where people travel to and from along the Metrorail line. Many tickets indicated travel between the Gqeberha and Swartkops area (Source: Author, 2024)

Upon speaking to people through semi-structured interviews, it became clear that many people would use the train, if it ran more often, and if the train stations were more accessible to where they lived. Nearly everyone agreed that the train was safe - which was an unexpected finding - and that it was by far the cheapest mode of transport. However, quite a few people expressed concern at the fact that, while it was safe on the train, the areas surrounding the stations were not, which was a reason some people didn't use the train. People also indicated that they would rather take a taxi or bus for their transportation needs if they did not live near the station - as this involved paying only the bus or taxi fare - rather than paying for a taxi to the train station

and then a train to their destination. It became clear that the stations are not close enough to the population centres in the metro.

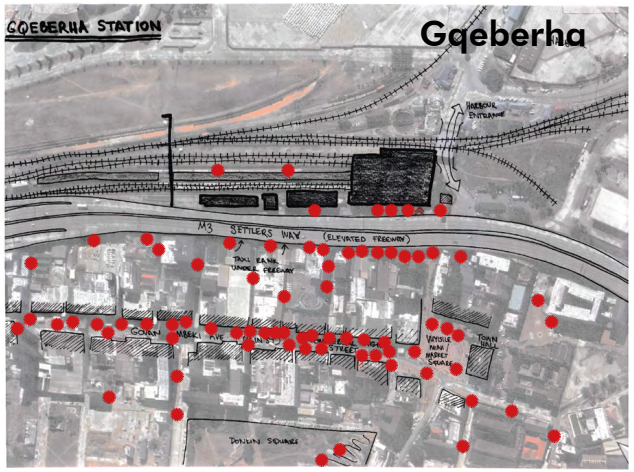
Infrastructural challenges also became apparent when engaging with people at the stations. The line is only electrified up to Swartkops (where it branches off on the main line to Johannesburg) and becomes a single, non-electrified line from Swartkops to Kariega. This means that ageing diesel trains need to be used, and the frequency of the train running is limited by due to there being only a single line - passing trains have to wait in sidings at stations, delaying the travel time.

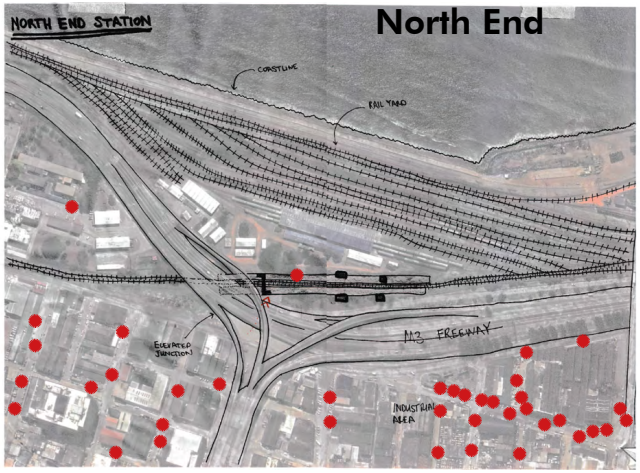
Challenges due to the ownership of the line itself also make it difficult to improve the service. The line iself is owned by Transnet, the state-owned company which owns and manages rail freight throughout South Africa, while the stations and Metrorail trains are owned and managed by the Passenger Rail Association of South Africa - PRASA. This means that there are sometimes delays due to freight trains using the lines at the time the passenger trains are meant to run.

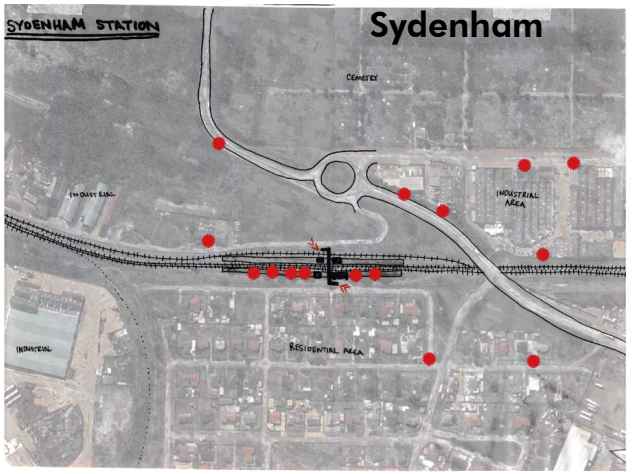
Figure 49: The Swartkops Station, despite being far from the township of Kwazakhele, was, along with New Brighton Station, the most used stations on the route (Source: Author, 2024)

During site visits, discarded tickets were collected, which indicate the station the person travelled from and to, as a way to gain an insight into the way in which people use the line. Currently, due to the unreliable nature of the service, only single tickets are sold, which means that tickets are discarded after each trip. This meant that collecting these tickets provided valuable insight into the journeys being made by commuters. From these tickets, as well as from the semi-structured interviews of those who use the service, and from observations made during the experiential site visits, it became evident that the most-used stations are those between the Gqeberha to Swartkops corridor - those stations nearest the most densely-populated townships in Nelson Mandela Bay. From Swartkops to Kariega, the line became less used, with the train being nearly empty in both directions.

Social mapping was used to provide a snapshot in time of the people in and around the stations, to get an understanding of how busy the station precincts were, and where activity was taking place. By doing this at the same scale for each station, the differing







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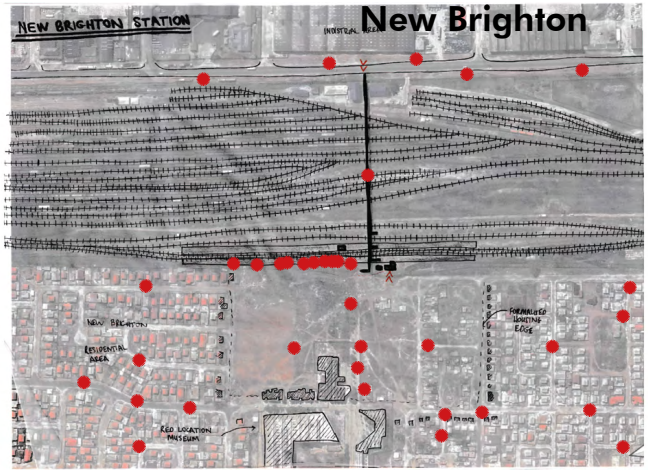

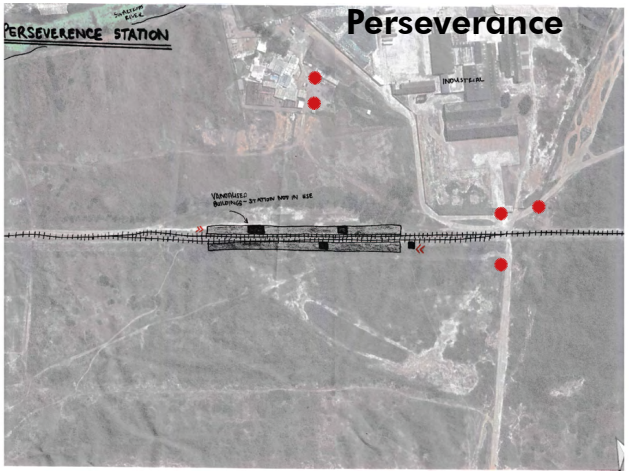

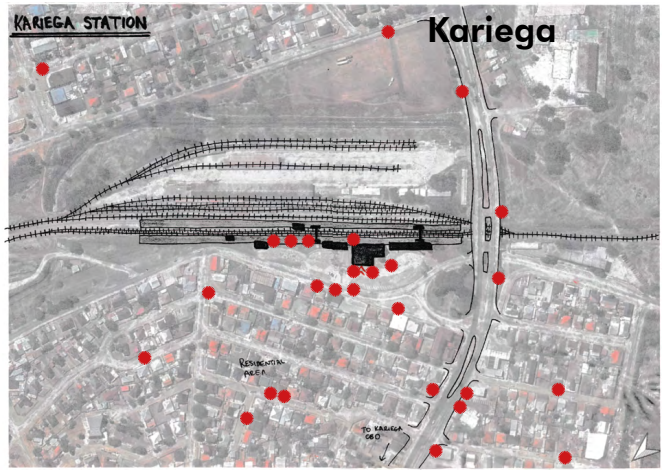

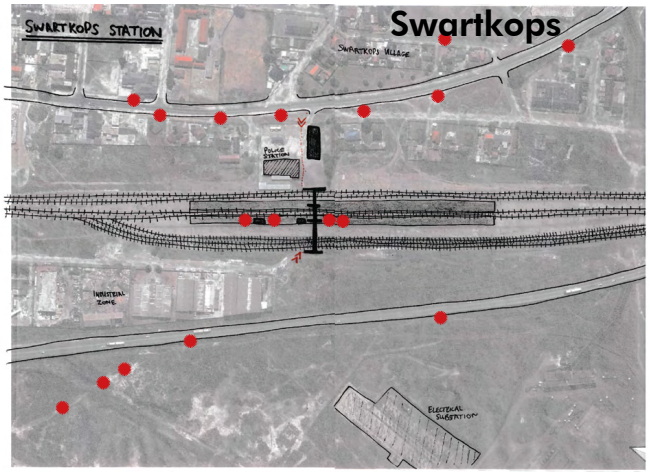

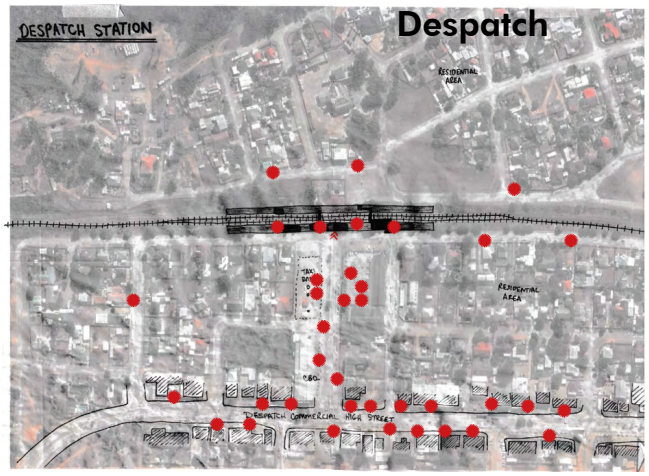

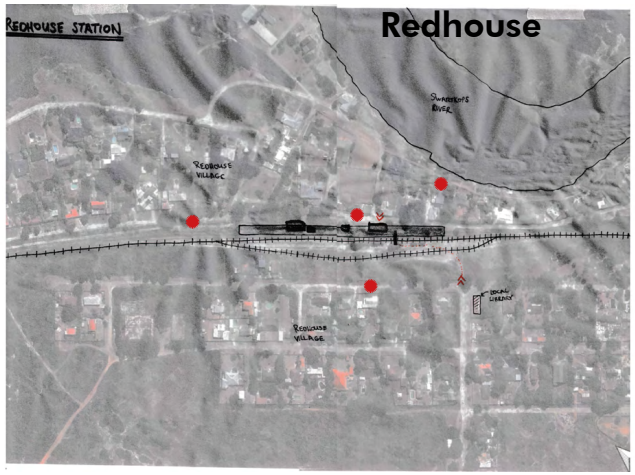

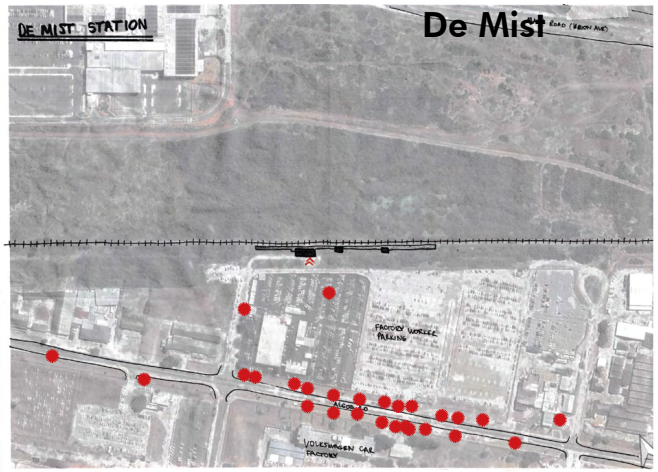

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Figure 50: Each of the stations are shown here at the same scale, and orientated so that the stations are all running in the same direction. The red dots indicate, approximately, where pedestrians were on a typical weekday afternoon shortly before the evening train from Gqeberha to Kariega (Source: Author, 2024)

urban conditions at each station could also be compared, such as the different grain of the built fabric between the city blocks of Gqeberha Station and the individual single homes in New Brigton Station.

The findings provided valuable insight into the line, and gave some ideas for possible interventions and intervention areas based on aspects noticed on the ground.

Contextual Analysis: Nature

The context was analysed based on three layers - linked to both the theoretical background and aspects of importance identified while on site and carrying out the methods of investigation.

These three layers are:

A **natural** layer, which analyses the natural system in the study area, including topography, water systems and green space.

A **people** layer, which analyses where people live and move in the study area, including building footprints, and present-day patterns that have been shaped by past and present factors.

A **memory** layer, which analyses places and spaces of historic interest and importance, specifically in regard to the railway line, and how these historic markers or traces are relevant today.

These layers then build onto each other, leading to an enabling framework that uses these layers to re-imagine the railway line and point to a focus area of intervention.

The natural system at the metro scale, particularly around the area of the railway line, is focused on the natural river system draining out to the sea - the Swartkops River and Estuary. This system manifests in a large river system that shapes the surrounding topography and human settlement.

Because of the flat topography nearest the river plain, the railway line runs along it for much of its length. The river widens as it reaches the ocean, creating a barrier between the two sides of the river.

Because of the flat topography, there are also salt pans and vleis, with the salt pans being commercially exploited. These provide more barriers between the people and the Swartkops system, and thus provide barriers to entry to accessing the natural system.

Figure 51: The railway is situated in the greater Swartkops natural system (Source: Author, 2024)

Key Points

The river system becomes less prominent as you head upstream

A portion of the Swartkops estuary is a protected nature reserve

The Swartkops estuary is prone to flooding and to strong tides, causing occasional flooding in the valley

Salt flats and provide economic opportunities but limit access to the natural system for people

Areas of natural land are severely degraded due to industrial activities over many years

The coastline is another important natural feature that the train line runs along as well

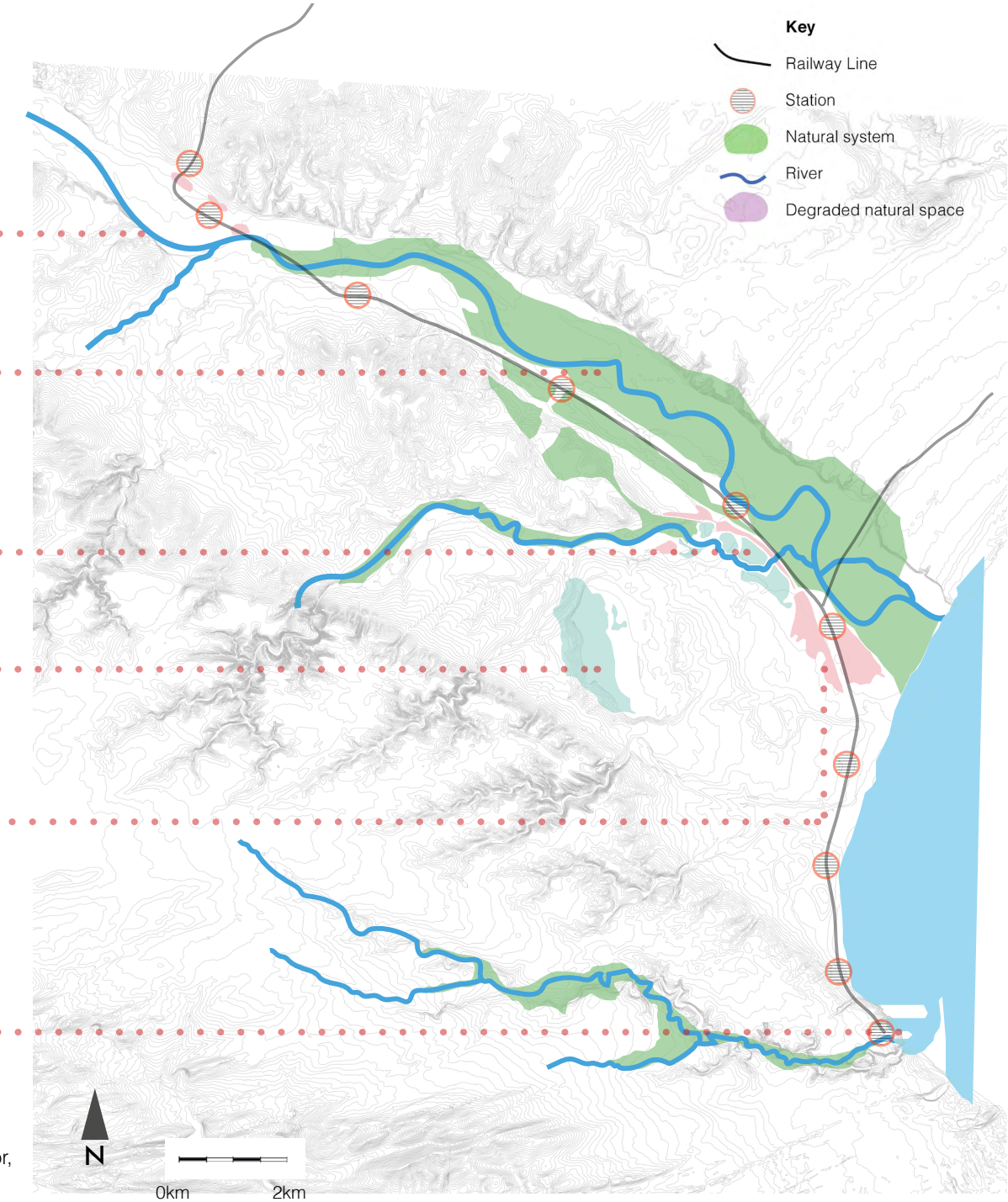


Figure 52: The natural system of Nelson Mandela Bay (Source: Author, 2024)

People

Due to legislation and practices such as the Group Areas Act, the NMB Metro remains largely segregated in terms of race and economic status. The sprawling suburbs of Kwazakhele and Ibhayi are situated on the south of the Swartkops River, with Motherwell situated on the north. These townships were mostly established initially for migrant labour, until they gained a more diverse (in terms of age and gender of inhabitants) and permanent population. Due to historical reasons, these townships are still largely underresourced compared to the area's suburbs.

Today, the two most densely populated neighbourhoods are Motherwell and Kwazakhele, across the Swartkops River from each other. Both of these neighbourhoods have large numbers of people who live in the city and suburbs of Gqeberha, and there is therefore a large demand for public transport to and from the city each day. A much smaller number of people travel from these townships towards Kariega.

Most people live far from the railway line, and so it isn't convenient to make use of the system - even if the trains are running at a convenient time, using them would often entail first using a taxi, which increases time and cost of travelling. Private car ownership in the townships is low in comparison to the suburbs and most people therefore rely on public transport, predominantly buses and taxis (NMBM, 2023).

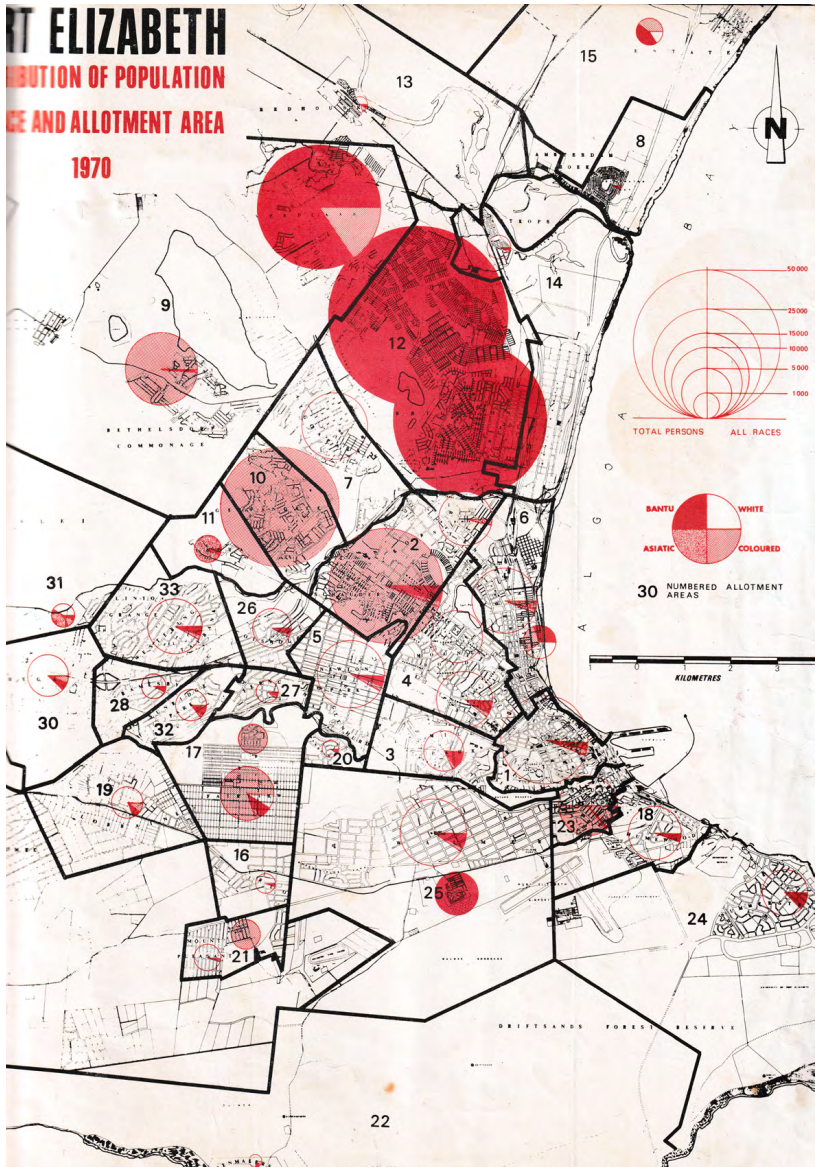


Figure 53: This map showing the neighbourhoods of Port Elizbaeth during the Group Areas Act shows the location of where most Black people lived in 1970 - in the New Brighton - Kwazakhele township. Swartkops, by comparison, is a tiny dot of mostly White people (Source: Davies, 1971)

Key Points

Most neighbourhoods are bound by the main movement route - the R75 road - and use this as the main vehicular route

People live and move far from the stations for most of the route - where the most people live

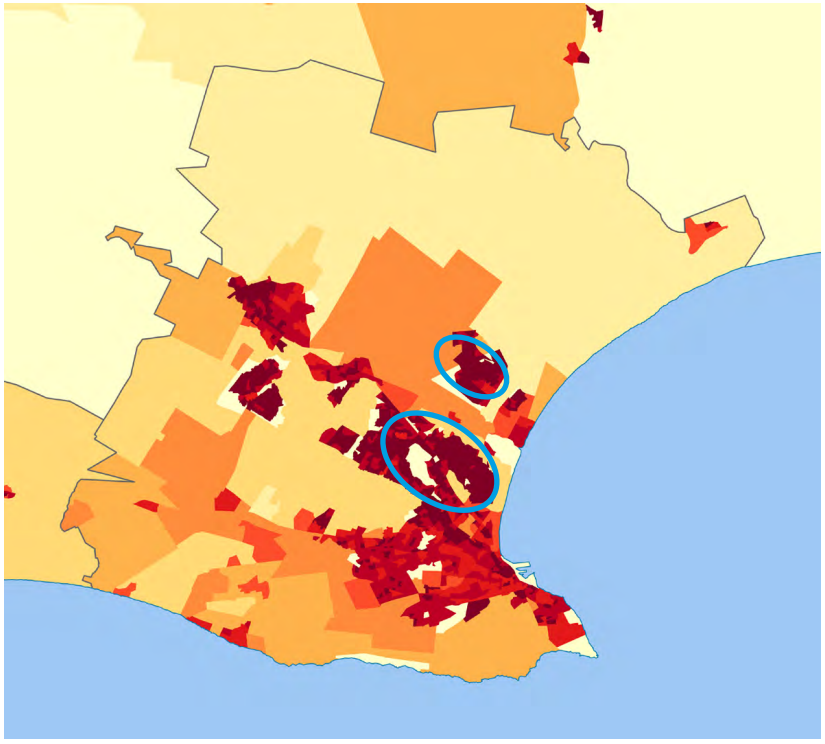


Figure 54: Population density of Nelson Mandela Bay with Motherwell and Kwazakhele circled, showing their high relative densities (Source: StatSA, 2011)

Figure 55: The urban morphology of the neighbourhoods along the railway line (Source: Author, 2024)

Memory

Memory refers both to the tangible traces of history, as well as to less tangible elements of memory.

In Nelson Mandela Bay, and given the pioneering qualities of railway lines in many South African cities, the railway line acts as a convenient “string” to hold several beads of heritage.

These include the linking of the historic centres of Kariega and Gqeberha, with their historic station buildings. It also includes the township of New Brighton, home of many Struggle veterans such as Govan Mbeki, the father of former president Thabo Mbeki.

New Brighton also contains the Red Location Museum and archive which, although currently closed, has the possibility of being a major learning and tourist space in the city.

Swartkops holds its own traces, with the town being over a century old. Its school and church are both still in use, with the school (which is 105 years old) providing schooling to many children from the Kwazakhele township.

The line itself, dating from 1875, provides a layer of memory and trace in the understanding of the growth and morphology of the region.

Figure 56: The stone chimney is all that remains of the brickworks that gave Despatch its name (Source: Stow, 1973)

Key Points

The historic centre of Kariega is one of the oldest towns in South Africa, predating Gqeberha

The original station in Kariega is now a (currently closed) railway museum

The entire town of Despatch owes its name and existence due to the railway line and the fact that bricks made there used to be dispatched by rail, with the old chimney being the only trace of this heritage

The railway line itself dates back to 1875, making it one of the older lines in South Africa

Redhouse dates back to the late 19th Century as an idyllic riverside village

Swartkops as a village dates back to the early 20th Century, with the power station being built in the late 1940s

New Brighton is the oldest township in Nelson Mandela Bay, and houses the Red Location Museum

Gqeberha's city centre dates back to the 19th Century, with the railway station from 1888.

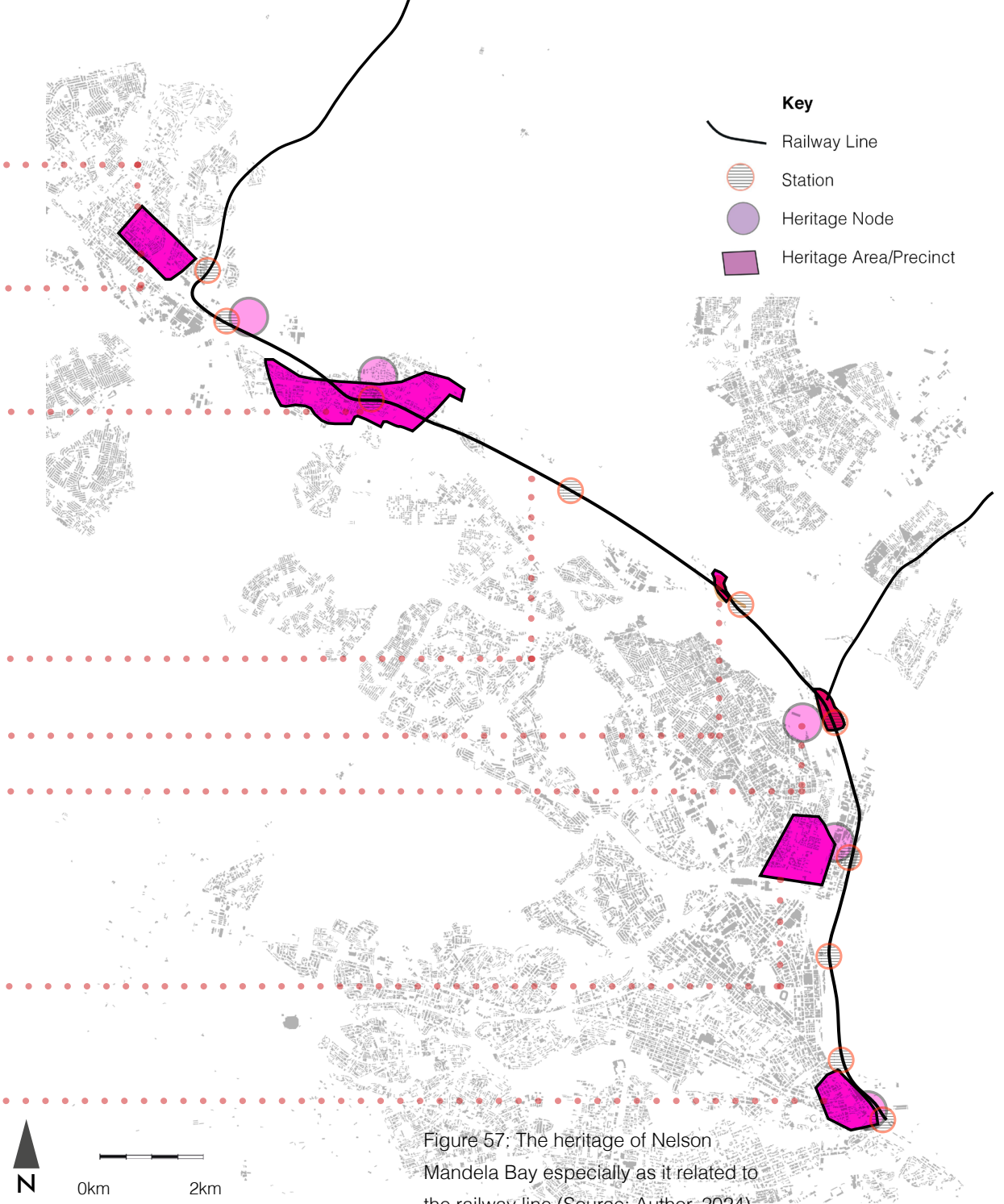


Figure 57: The heritage of Nelson Mandela Bay especially as it related to the railway line (Source: Author, 2024)

An Enabling Framework

Based on an understanding of the three layers unpacked - nature, people, and memory - these layers can be understood together towards an opportunities and constraints map, which leads to an enabling framework, at a metro scale.

Key to the enabling framework is the notion of access to the natural system, through the creation of trails (for hiking and cycling) and better integration into the natural system, providing access to nature for all.

The enabling framework does this through re-imagining the role of the railway line - with it no longer running to Kariega, but rather, a fully electrified, modernised line running from Gqeberha to Motherwell. This creates an important node at Swartkops, where the line takes a turn to Motherwell.

To replace the train service to Kariega (which tends to see much lower demand), a bus system is created that runs through, rather than bypassing, the townships and neighbourhoods through which it runs. This bus system is linked to the Swartkops and New Brighton stations, creating a convenient link between the transport modes.

The railway line between Swartkops and Kariega remains for the occasional freight charter train, but the stations become re-imagined rest stops along the parallel cycle and hiking route, allowing access to the natural system for all.

Figure 58: Exploring opportunities and constraints map at the metro scale (Source: Author, 2024)

Figure 59: Exploring an enabling framework at the metro scale (Source: Author, 2024)

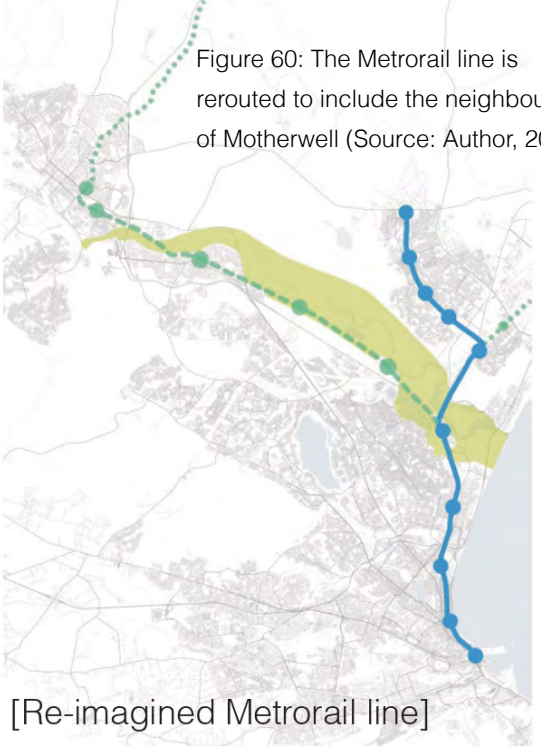


Figure 60: The Metrorail line is rerouted to include the neighbourhood of Motherwell (Source: Author, 2024)

Figure 61: A bus route and hiking/ cycling route replace the existing line for both commuting and recreational activity (Source: Author, 2024)

Figure 62: An enabling framework to unlock the Swartkops precinct as well as the whole line (Source: Author, 2024)

Figure 63: Swartkops Power Station behind the rail yard and station (Source: Author, 2024)

RE-IMAGINING

Why Swartkops?

Swartkops is an area with immense importance in the Nelson Mandela Bay context. It is a riverside village that is an important part of the landscape of Nelson Mandela Bay. The village arose out of the easy access that the railway line provided to the the Swartkops estuary, making it an easy place for a getaway from city life.

However, it also became an important place due to its location on the rail network. Swartkops Station was (and is) the last station before the railway line branches off to either Kariega (and beyond on to Klipplaat, Oudtshoorn and Graaf-Reinet), or, on the other line, off in the direction of Johannesburg. This made Swartkops an important node in the rail network.

The availablility of land in the coastal flat lands, and the closeness to the rail network, made the site one that was chosen in the 1950s for the Swartkops power station. This has since become a very well-known landmark in Swartkops and surrounds, despite it not being in service as a power station since 1996 (Fourie, 2013). It now stands largely disused, and awaits redevelopment.

Since the 1980s, the township of Kwazakhele has developed near Swartkops - but due to, amongst other things, the Group Areas Act, as well as the physical location of infrastructure such as the power station and railway line, the township is not able to access the opportunities available in Swartkops. This, combined with the natural and heritage aspects of the Swartkops area, make it the suitable area for a catalytic node in a re-imagined railway line that runs from Gqeberha to Motherwell, and re-imagining the township's link to the Swartkops green belt and natural system.

Figure 64: Swartkops Station in the early 1900s (Source: McClelland, n.d.)

Figure 65: Swartkops river as a fishing spot (Source: McClelland, n.d.)

Understanding the Focus Area / Analysis

The Swartkops (“dark hills”) area is derived from the Khoi word Zungah, meaning dark hills (Harradine,1996). Its history as a town begins with the building of the railway line to Kariega in 1875. Since this time, the village has been on the main railway line into and out of Gqeberha / Port Elizabeth, having a valuable role as a station for passengers and goods.

The village of Swartkops, on the south side of the Swartkops estuary, was linked in 1871 with a bridge to the north, which is still in use after many upgrades, and was named the Wylde bridge after the engineer who constructed it. This provided a link to the small riverside village of Amsterdamhoek (which, along with Swartkops village, is still a popular spot for fishing and many other recreational activities).

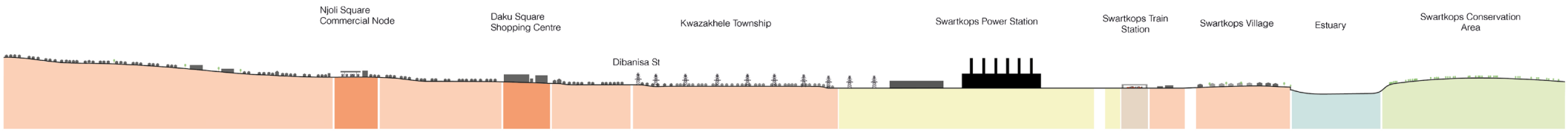
The village of Swartkops grew as a popular spot away from the bustling Port Elizabeth, especially as it was just a short train trip away. The Anglican church and primary school, both of which are still in use, were started in the early 20th Century.

Under the Group Areas Act of 1950, Swartkops was classed as a white area, which prevented non-white people from living there. The township of Kwazakhele, was started in the 1950s as a cluster of hostels for black migrant worker men. It was separated from Swartkops by distance and the natural low-lying green belt of the Swartkops estuary, and by the newly-built Swartkops Power Station. This power station was constructed in 1954 to provide power to the rapidly growing area of Port Elizabeth. It soon became a well-known landmark in the city, even after it was decommissioned in the 1980s due to the high price of bringing coal from upcountry.

Kwazakhele is linked to Swartkops, indirectly, by arterial roads. However, pedestrians cut through the “wasteland” of degraded natural systems to get to Swartkops, if going by foot. Swartkops and Kwazakhele are separated by a considerable gap of “nothingness,” punctuated by the huge power station. The area is largely flat, and can be prone to flooding.

The main road leading from Swartkops through to the heart of Kwazakhele is Dibanisa St, which ends in Njoli Square, an important node at the metro scale for transport interchange and informal trade.

Figure 66: The focus area in section from Njoli Sq to the estuary (Source: Author, 2024)



Existing E-W Section across Kwazakhele and Swartkops

Vertical scale 1:10 000

Figure 67: A satellite image of the focus area (Source: Author with imagery by ESRI, 2024)

Nature

The natural system plays a large role in the focus area, with the estuary and the natural flood plain being natural structuring elements of the landscape. The 100 year flood line is an important structuring element on the west side, given how flat the landscape is.

Much of the natural system is degraded due to years of industrial activity and a lack of conservation efforts around the former power station.

The water from the Swartkops river is also often polluted due to rubbish or sewage, and there is an opportunity to improve the water quality through improving and conserivng the natural wetland systems that exist around the estuary itself, in addition to other mitigation methods to ensure clean water.

People

Kwazakhele is one of the most densely populated neightbourhoods in Nelson Mandela Bay, along with Motherwell. Most of the housing is formalised, with a gridded street layout which makes accessibility fairly easy. Despite the high population density, most homes are single family, single storey homes. The main streets are also designed primarily for cars, making the main streets, such as Dibanisa St, less vibrant than it could be.

Swartkops vilage itself consists of single homes, and is not very dense. Its population is mostly older people who have lived there for a long time. There is a large opportunity of densification in both Kwazakhele and Swartkops. There is also an opportunity to make many of the predominantly residential dwellings on the main streets into mixed use, with shops on the ground storey and housing upstairs, for instance.

This will increase the bulk of the built fabric and will allow for the street to become a more defining urban element than the current model which consists of wide roads with little regard for the street edges.

Figure 68: The natural system of the focus area (Source: Author, 2024)

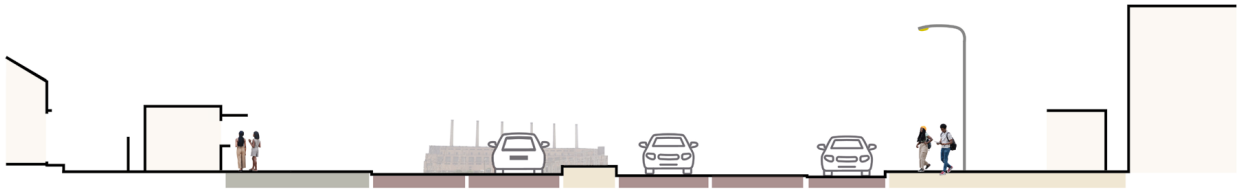


Figure 69: An existing section of Dibanisa St at Daku Square showing the width and lack of mixed use activity and how people use the space (Source: Author, 2024)

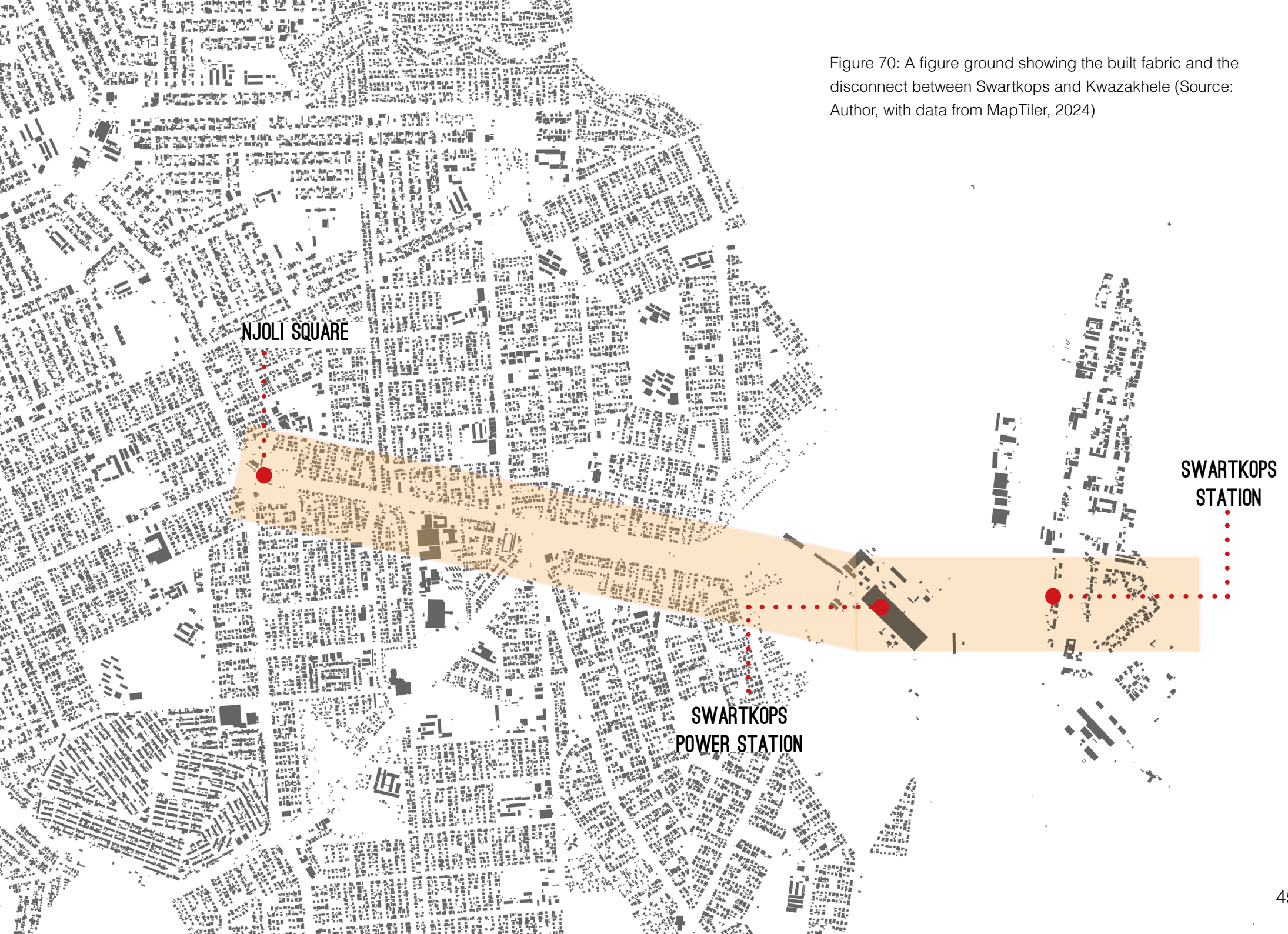


Figure 70: A figure ground showing the built fabric and the disconnect between Swartkops and Kwazakhele (Source: Author, with data from MapTiler, 2024)

Memory

The main feature in the landscape in the focus area is the Swartkops Power Station, which has value as a building with preserved industrial heritage in South Africa, especially given South Africa's historic and current reliance on coal power plants. This building has also become synonymous with the Swartkops area and is a landmark.

The village of Swartkops has history going back over a century, with some of this memory being found in elements such as the school and the church in the village.

Kwazakhele has a more recent history, but does have roots in the 1950s, starting out as a men's dormitory suburb township. It is likely that much of the history and memory from this neighbourhood will be in oral form, given that much of the neighbourhood was developed in living memory.

The train line and Swartkops estuary itself have much memory and history to it as well, with many people having fond memories of these elements. Often this history remains unrecorded.

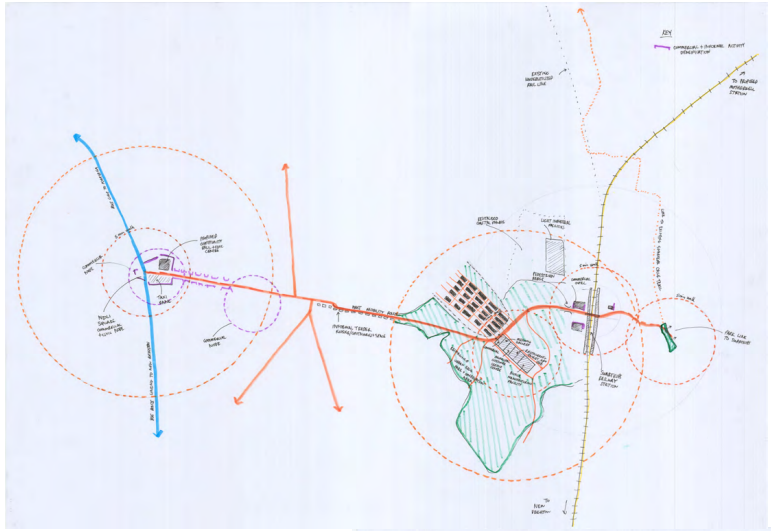
Figure 71: The Swartkops Power Station is a building of significance and heritage and has the potential to be re-imagined to become significant in its use to the community (Source: Fourie, 2013)

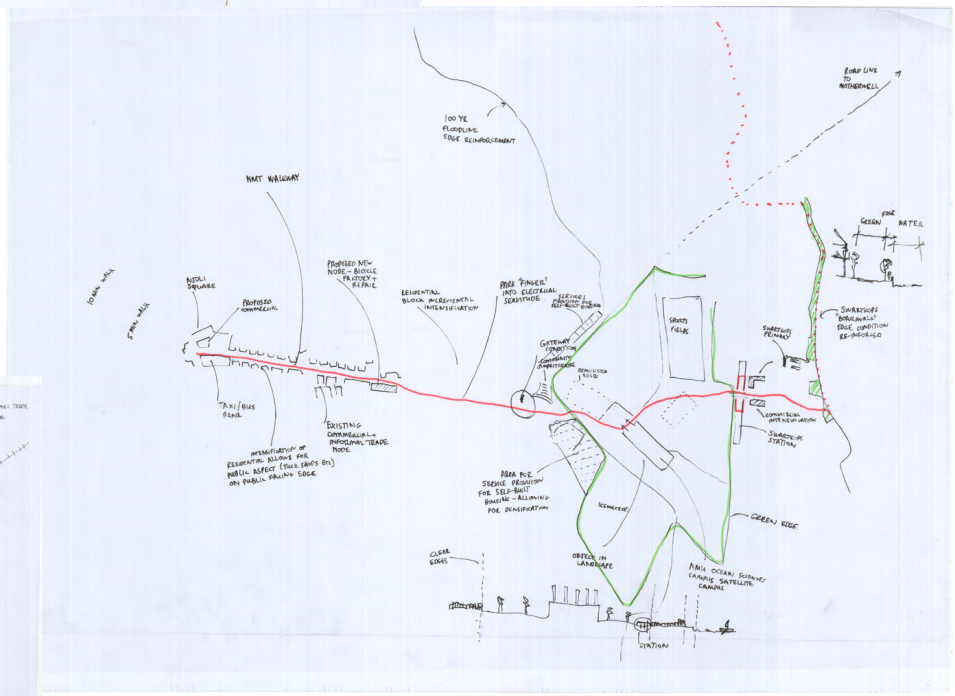
Opening up possibilities

It starts becoming clear that in order to make the railway line viable, it needs to link back into the township. Swartkops and the link into Kwazakhele provides a valuable node at which this can occur, via the Dibanisa St corridor. This corridor is currently a largely car-dominated road, and there is no defined way through the power station precinct to Swartkops.

The possibility exists to create a connection for a non-motorised transport corridor - open to pedestrians and cylists - that connects Kwazakhele - all the way from Njoli Sq and beyond - through the power station precinct and into Swartkops itself, linking through the train station.

The power station then becomes an important node, being a landmark building but also being a space for opportunity to occur.





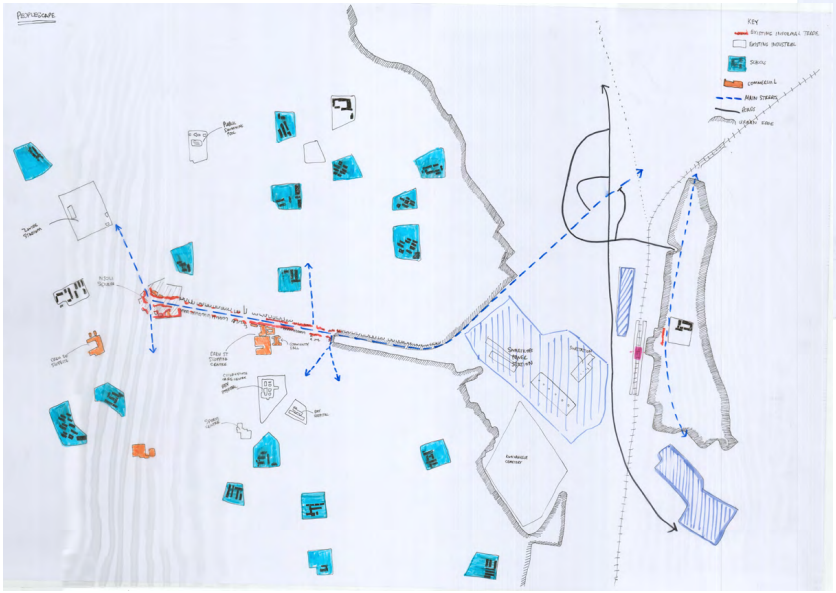
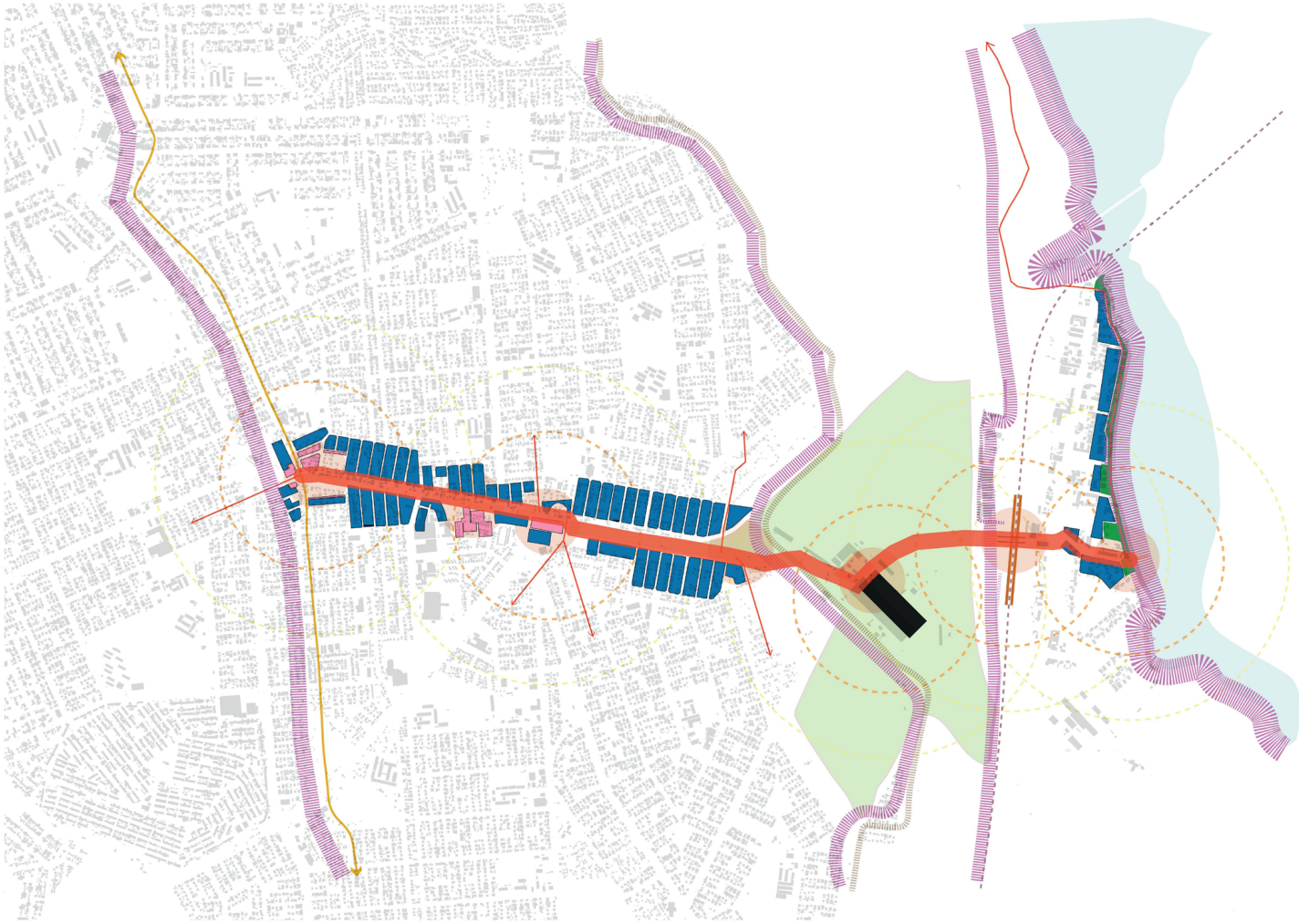


Figure 72: Beginning to conceptualise a link between Njoli Square in Kwazakhele and the railway line (Source: Author, 2024)

Design Intent

Figure 73: The design intent looks at ways of creating a link between the township, railway station and village though an ecological urbanism lens (Source: Author, 2024)

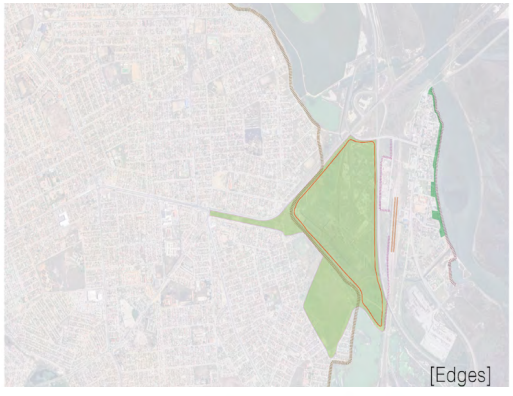


A connective corridor linking Kwazakhele to Swartkops village, passing through the green corridor and the power station, and defined by a series of defined thresholds or edges, to bring Swartkops and Kwazakhele together around a new hub centred around the train station.

Guiding Principles and Strategies

[Principles]

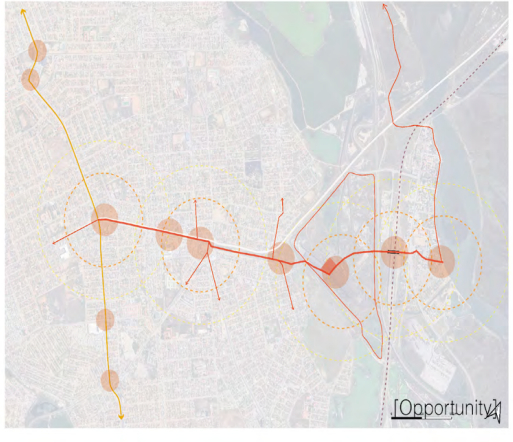
[Strategies]



Holding of Edges

Edges need to be clearly defined through articulated thresholds between urban and natural zones, discouraging sprawling neighbourhoods and increasing resilience resilience of the urban environment.

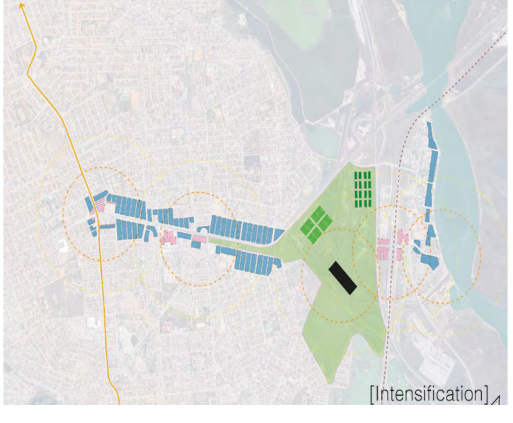
- Pathways as edge
- Vegetation as edge
- Densify edge buildings



Opportunity

Create opportunity for people from the community to:
- access the city and its economic opportunities
- access to the natural system and its recreational opportunities

- Informal trade opportunities
- Accessible non-motorised-movement routes for all
- Public facilites available to all



Intensification

Existing activities are to be intensified through densification of the built fabric, through incremental incentivised upgrades. This should prioritise transforming streets to mixed use spaces accessible to all.

- Promoting mixed use ground storey and residential upper
- Backyard dwelling service provision
- Reduced street setbacks and infill

A Community Accessibility Framework

The community accessibility framework identifies the Dibanisa St corridor through to Swartkops as the focus area in creating a link to both the railway system and a link between the town of Swartkops and the township of Kwazakhele.

This framework is informed by the principles already outlined: namely, intensifying activity along the corridor, creating opportunities - economic, educational and in terms of access to the natural system.

The framework looks at strengthening edges and thresholds, creating a clear divide between the natural and urban environment.

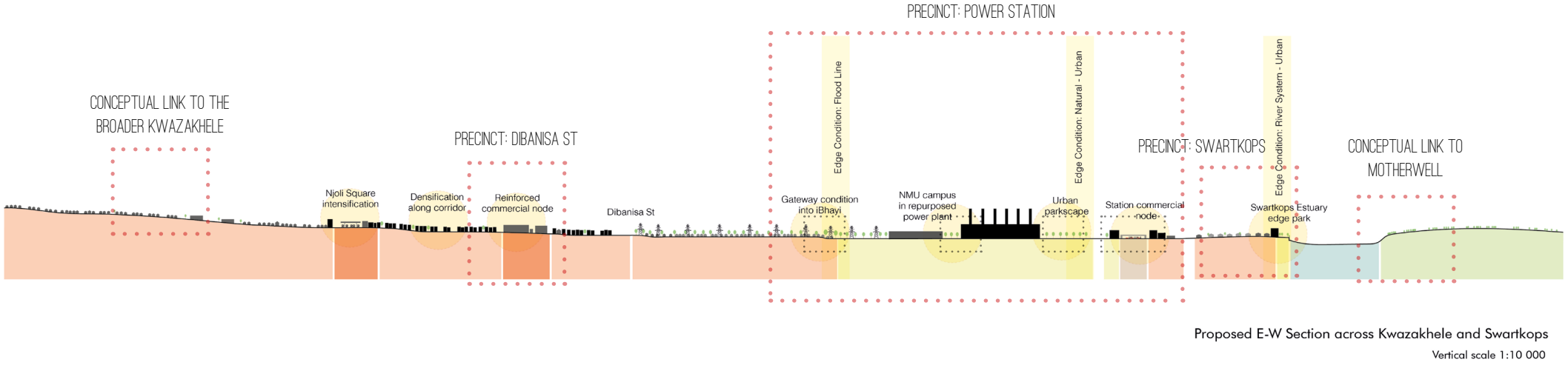


Figure 74: Re-imagining the corridor as one of opportunity, intensification, and clear edges (Source: Author, 2024)

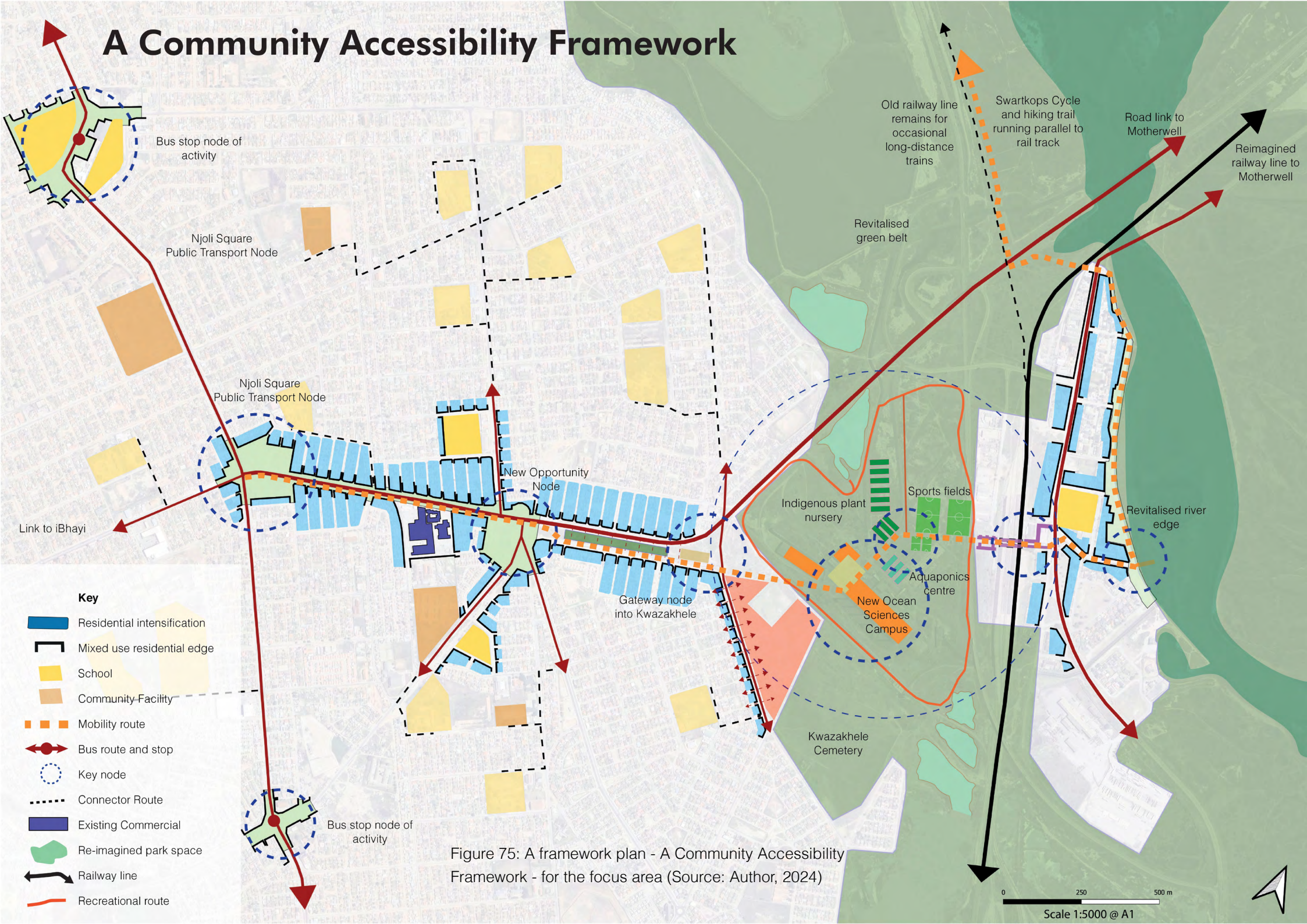


Figure 75: A framework plan - A Community Accessibility Framework - for the focus area (Source: Author, 2024)

Unpacking the Precinct

The main precinct is made up of the Swartkops Power Station and surroundings, namely:

1. The commerical node and **reinforced hub of the Swartkops Train Station** as a gateway to the re-imagined Swartkops/Kwazakhele Precinct

2. A **new gateway into Kwazakhele**, emphasising the entrance condition to this part of the city and acting as a threshold between the natural and urban systems

3. The old **Swartkops Power station now revitalised as a new Ocean Sciences Campus for Nelson Mandela University**, supporting the notion of the space becoming a 'campus for the people'

4. These three elements above are linked by the **natural system being revitalised as a park**, bringing the natural system to the people and linking to the greater natural system.

These four sites form the Swartkops Power Station precinct, linked by the idea of a movement corridor stretching from Njoli Square to the river edge (and beyond).

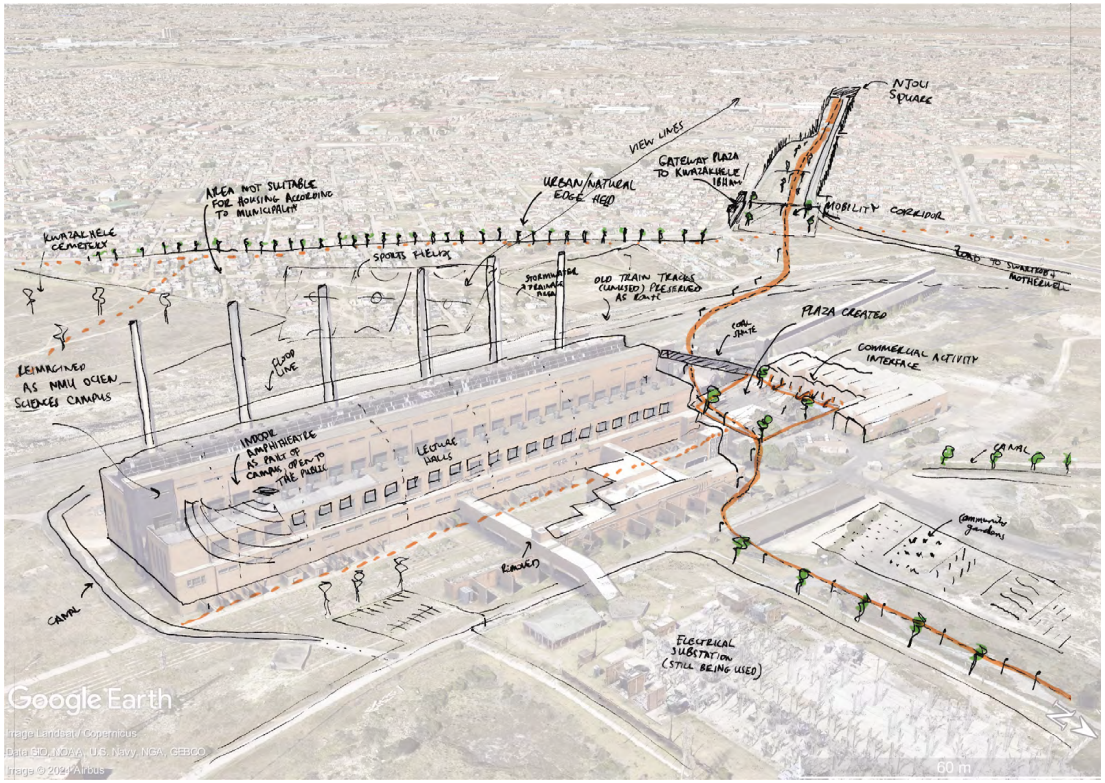


Figure 76: Re-imagining how the power station could become an educational and community hub (Source: Author, 2024)

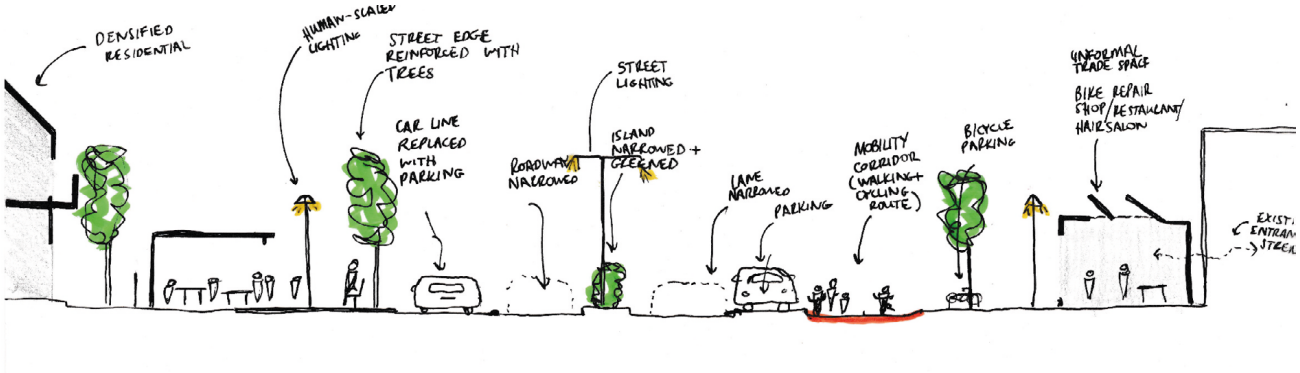
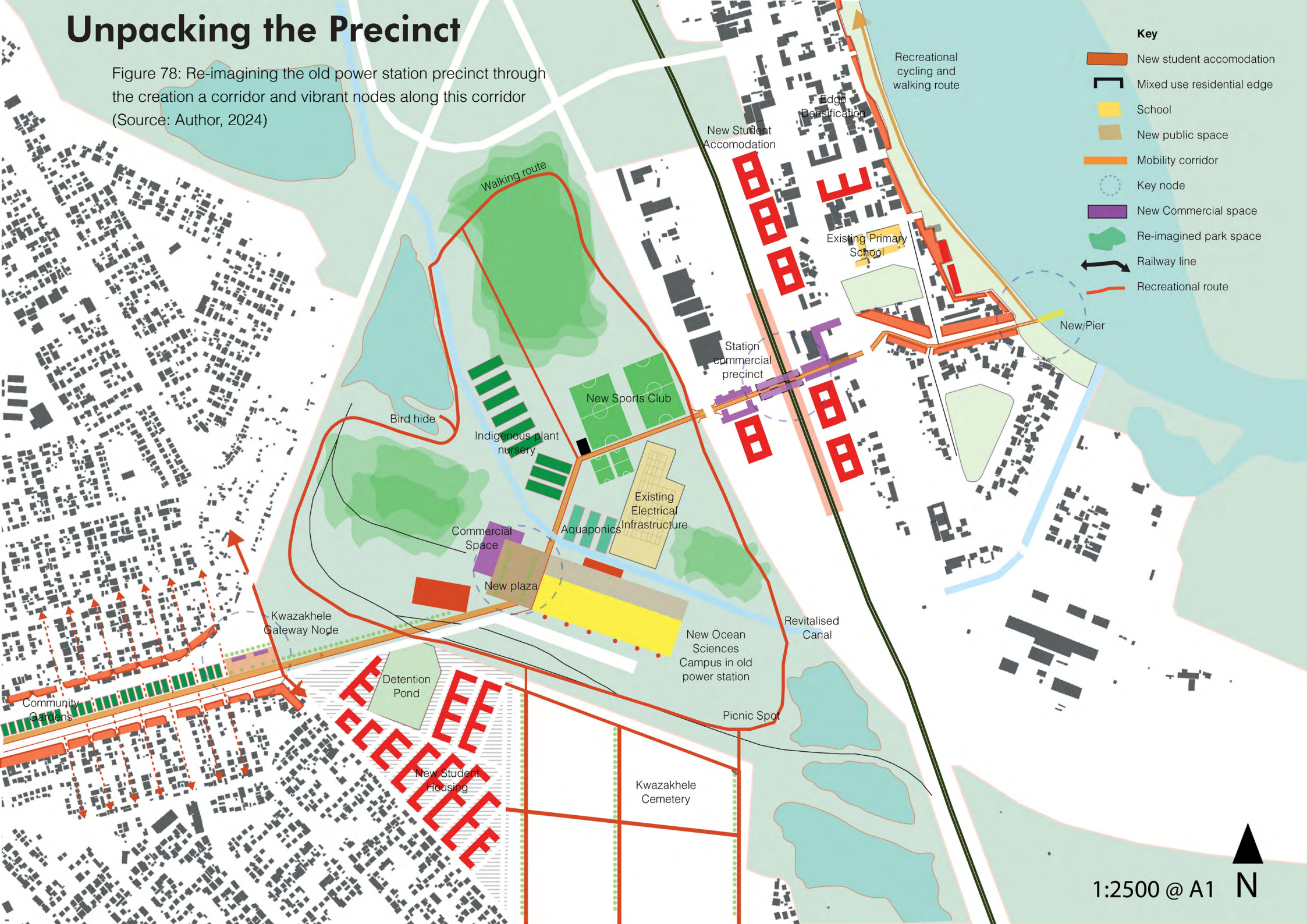


Figure 77: Re-imagining how Dibanisa St could become a more active and opportunity-filled street as part of the framework (Source: Author, 2024)

Unpacking the Precinct

Figure 78: Re-imagining the old power station precinct through the creation a corridor and vibrant nodes along this corridor (Source: Author, 2024)



Interventions

Njoli Square

Existing

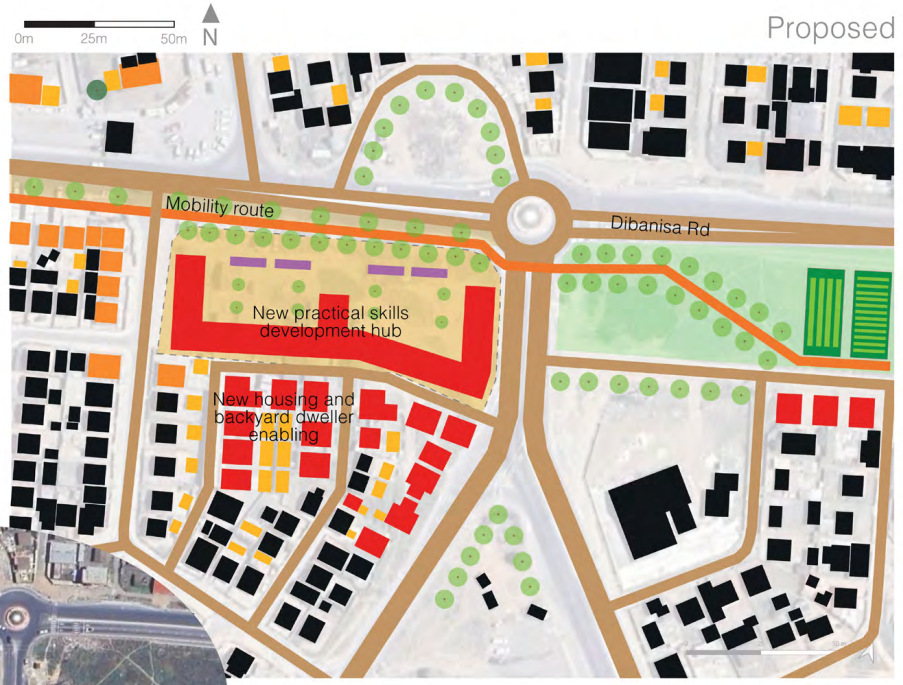
Proposed

Figure 79: Njoli Square, as a link to the rest of the township, becomes an even more important node (Source: Author, 2024)

The opportunity node proposes the creation of a new node with a strong street interface, with a facility to provide economic opportunities for local people, along with creating a more human-scaled streetscape.

Opportunity Node
Proposed Section

Section on A-A
Scale 1:150

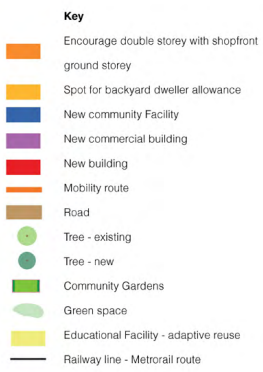


Proposed

Existing

Opportunity Node

Figure 80: The opportunity node on Dibanisa Rd would be able to teach practical skills to local people (Source: Author, 2024)



The Njoli Square intervention looks to strengthen existing activity on site as well as to introduce a multi-purpose community hall where it is very easily accessible to the local community. A new bus stop for the proposed bus route (proposed at the enabling framework level) is also included.

Figure 81: A new gateway into Kwazakhele (Source: Author, 2024)

The Kwazakhle Gateway node aims to create a prominent gateway condition into Kwazakhele, along the proposed mobility corridor. This is done through an appropriately-scaled plaza-type intervention, as well as the introduction of a tourism office to facilitate tourist activity in the area. Community garden are introduced to the west, along a power line servitude which prevents other types of development.

The Swartkops Power Station is transformed into the new home of the Nelson Mandela Bay Ocean Sciences Campus, with other existing buildings becoming a restaurant, to create a vibrant public plaza space, all situated along the new movement corridor running from Njoli Square to the Swartkops River edge. The surrounding parkscape is revitalised and becomes an area of recreation and nature conservation.

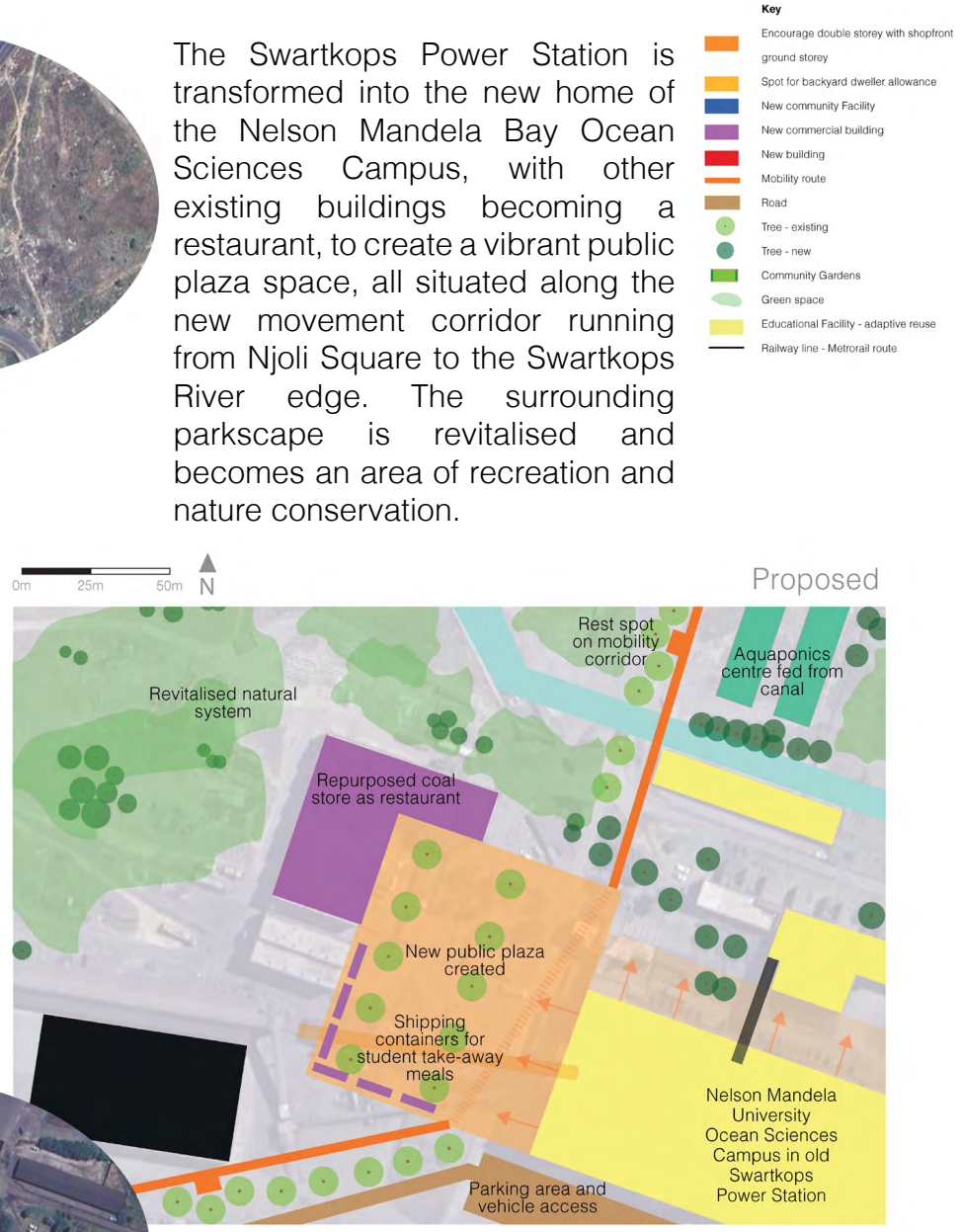


Figure 82: Revitalising the old Swartkops Power Station to become the Nelson Mandela University Ocean Sciences Campus (Source: Author, 2024)

Swartkops Gateway - Station

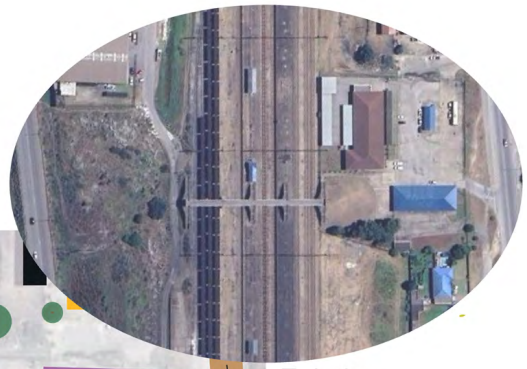


Figure 83: The Swartkops Train Station becomes a vibrant node of interchange, with commerical developments coupled with student housing, to become an important node for the metro(Source: Author, 2024)

The Swartkops Train station node becomes the focal point of the intervention, being a space of interchange and being the gateway to the Swartkops Area. The introduction of commercial activity around and over the train station further strengthens the station's role as a major gateway node to the precinct, with nearby student housing creating a 24 hour vibrant space.

The Swartkops Village and river edge gateway is re-imagined as a student town, with densification not just around the train station, but also along the river edge, emphasising the importance of the river edge. The movement corridor ends in a new pier that creates a visual link with Motherwell, with links to the Swartkops hiking and cycling trails to access the conservation area.

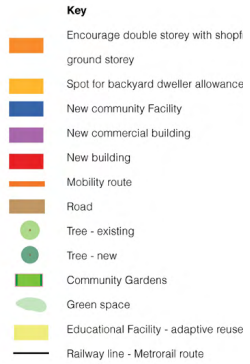


Figure 84: The Swartkops village is densified with student housing, with a new pier ending the movement corridor, and providing a conceptual link to the township of Motherwell across the river (Source: Author, 2024)

Swartkops Village and River Edge

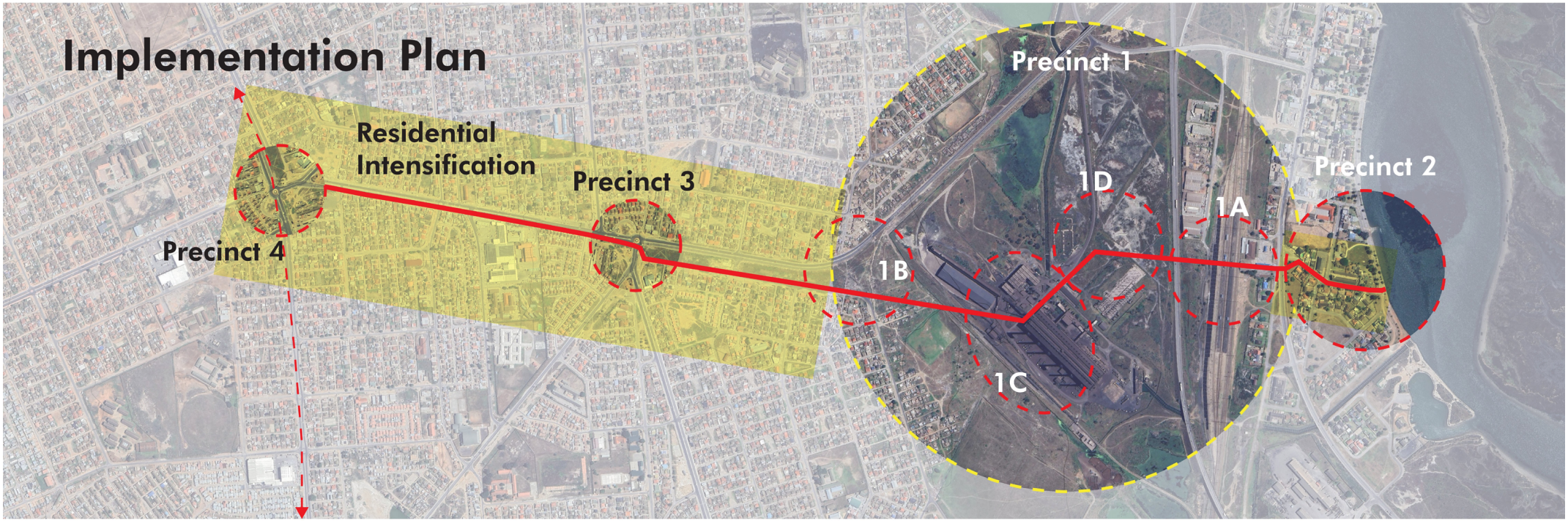


Figure 85: Through a project-based phased approach, the framework plan is able to be implemented incrementally (Source: Author, 2024)

PRECINCT 1 - SWARTKOPS POWER STATION

1A - Train Station
1B - Kwazakhele Gateway
1C - Power Station
1D - Parkscape

PRECINCT 2 - SWARTKOPS RIVER INTERFACE

PRECINCT 3 - NEW NODE IN DIBANISA RD

PRECINCT 4 - NJOLI SQUARE

PHASING PLAN

Phase 1: Rail route to Motherwell completed

Phase 2: Swartkops Station Commercial Development and beginning of incremental residential intensification; bus route implemented

Phase 3: Mobility Corridor from Njoli Sq to Swartkops and Swartkops interface (Precinct 2)

Phase 4: Kwazakhele Gateway and Power Station reimagined as Nelson Mandela University Ocean Sciences Campus

Phase 5: Revitalised land and park developed in power station precinct

Phase 6: Civic node developed in Dibanisa Rd (Precinct 3) and closing off of residential intensification project

Phase 7: Continuous maintenance and evaluation

Conclusion

This project proposes radical changes to the rail system of Nelson Mandela Bay, which, through a phased implementation, will be a catalytic project at re-imagining the role of rail in the twenty-first century post-apartheid South African city.

This has been done through a process of investigation into the context - historic, natural and social - that has shaped the contextual circumstances, as well as an understanding of what others have had to say on the theoretical issues touched upon, and case studies of projects dealing with similar situations.

This led to a re-imagining of the railway line at a metropolitan area scale, with the line being changed to service the dense and populous township of Motherwell, and the line to Kariega being replaced with a more appropriate bus system, and the rail corridor becoming part of an integrated natural system.

In this process of creating a new contextual framework in which the railway line is given a new role, the focal point, and area of greatest opportunity, becomes the Swartkops station, along with the Swartkops Village, old power station, the connection to the nearby Kwazakhele township, and connection to the natural estuary system.

The Swartkops node then becomes re-imagined as a knowledge, commercial, and social hub for the city, creating an activity corridor from the important Njoli Square in Kwazakhele, through all the way to Swartkops, passing through a university and learning campus in the old Swartkops Power Station, through a bustling station precinct, to the edge of the protected estuary.

This catalytic corridor is informed by Soja's notion of spatial justice, and done with the intention of beginning to erase the divisive modernist apartheid planning practices, in the pursuit of a more just and accessible urban landscape, through access to the city (through the train line), access to the natural system (to the estuary and natural system) and access to opportunity (through a lively corridor providing social, economic and educational opportunities).

All of this must, of course come together in a simple question: does the end result answer the research question?

How can the Nelson Mandela Bay commuter rail line be re-imagined to ensure spatial justice?

In conclusion, the Nelson Mandela Bay commuter rail can be re-imagined through a fundamental re-alignment of the line with the current needs of the people, and through the creation of an integral node in the metro that uses the railway station as an anchoring point for a catalytic corridor that creates a series of opportunities through access to the natural system, as well as economic and educational opportunities.

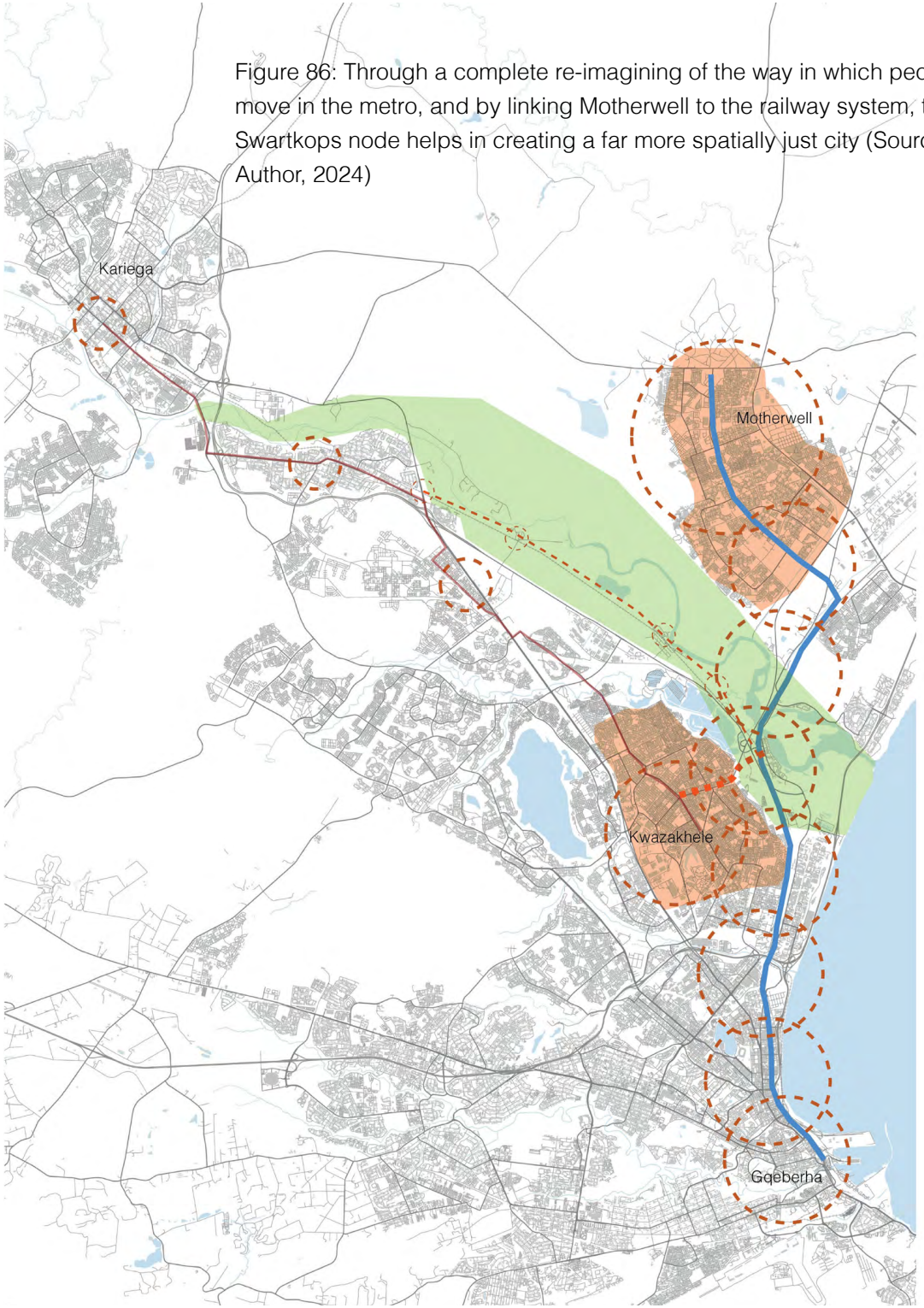


Figure 86: Through a complete re-imagining of the way in which people move in the metro, and by linking Motherwell to the railway system, the Swartkops node helps in creating a far more spatially just city (Source: Author, 2024)

Figure 87: Train tickets for a trip to Motherwell in a re-imagined, more spatially just city (Source: Author, 2024)

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List of Figures

(Source: Lorenz, 2019)
Fig. 31: The project looks at radically transforming a space not originally designed at a people-scale into a space for people (Source: Lesolle, 2021)
Fig. 32: Integration with the surrounding urban fabric is taken into account, as is making use of the existing infrastrutural elements on site to retain elements of the character of the space (Source: Lesolle, 2021)
Fig. 33: The integrated station precinct (Source: GAPP, 2022)
Fig. 34: The framework plan for the station precinct (Source: GAPP, 2022)
Fig. 35: Street sections in the station precinct showing the human scale throughout (Source: GAPP, 2022)
Fig. 36: Swartkops Station on a winter evening (Source: Author, 2024)
Fig. 37: The national rail system in South Africa, showing how the Nelson Mandela Bay Metro fits into the wider system (Source: Author, 2024)
Fig. 38: The Nelson Mandela Bay metro and the existing Metrorail line and stations (Source: Author, 2024)
Fig. 39: Gqeberha Station (Source: Author, 2024)
Fig. 40: Redhouse Station (Source: Author, 2024)
Fig. 41: Despatch Station (Source: Author, 2024)
Fig. 42: Sydenham Station (Source: Author, 2024)
Fig. 43: Perseverance Station (Source: Author, 2024)
Fig. 44: De Mist Station (Source: Author, 2024)
Fig. 45: New Brighton Station (Source: Author, 2024)
Fig. 46: Swartkops Station (Source: Author, 2024)
Fig. 47: Kariega Station (Source: Author, 2024)
Fig. 48: As part of the experiential site visits method, discarded train tickets were collected to see where people travel to and from along the Metrorail line. Many tickets indicated travel between the Gqeberha and Swartkops area (Source: Author, 2024)
Fig. 49: The Swartkops Station, despite being far from the township of Kwazakhele, was, along with New Brighton Station, the most used stations on the route (Source: Author, 2024)
Fig. 50: Each of the stations are shown here at the same scale, and orientated so that the stations are all running in the same direction. The red dots indicate, approximately, where pedestrians were on a typical weekday afternoon shortly before the evening train from Gqeberha to Kariega (Source: Author, 2024)
Fig. 51: The railway is situated in the greater Swartkops natural system (Source: Author, 2024)
Fig. 52: The natural system of Nelson Mandela Bay (Source: Author, 2024)
Fig. 53: This map showing the neighbourhoods of Port Elizbaeth during the Group Areas Act shows the location of where most Black people lived in 1970 - in the New Brighton - Kwazakhele township. Swartkops, by comparison, is a tiny dot of mostly White people (Source: Davies, 1971)
Fig. 54: Population density of Nelson Mandela Bay with Motherwell and Kwazakhele circled, showing their high relative densities (Source: StatSA, 2011)
Fig. 55: The urban morphology of the neighbourhoods along the railway line (Source: Author, 2024)
Fig. 56: The stone chimney is all that remains of the brickworks that gave Despatch its name (Source: Stow, 1973)
Fig. 57: The heritage of Nelson Mandela Bay especially as it related to the railway line (Source: Author, 2024)
Fig. 58: Exploring opportunities and constraints map at the metro scale (Source: Author, 2024)
Fig. 59: Exploring an enabling framework at the metro scale (Source: Author, 2024)
Fig. 60: The Metrorail line is rerouted to include the neighbourhood of Motherwell (Source: Author, 2024)
Fig. 61: A bus route and hiking/cycling route replace the existing line for both commuting and recreational activity (Source: Author, 2024)
Fig. 62: An enabling framework to unlock the Swartkops precinct as well as the whole line (Source: Author, 2024)
Fig. 63: Swartkops Power Station behind the rail yard and station (Source: Author, 2024)
Fig. 64: Swartkops Station in the early 1900s (Source: McClelland, n.d.)
Fig. 65: Swartkops river as a fishing spot (Source: McClelland, n.d.)
Fig. 66: The focus area in section from Njoli Sq to the estuary (Source: Author, 2024)
Fig. 67: A satellite image of the focus area (Source: Author with imagery by ESRI, 2024)

Appendices: Ethical Considerations

As the project involved speaking to people during the research and data gathering phases, including semi-structured interviews with people on-site, the project required ethical approval from the relevant Research Ethics Commitee. This was necessary to ensure that ethical considerations were taken into account in carrying out the methods, and to ensure that no one's human rights were compromised during the carrying out of research.

As part of the ethical considerations, participating in any aspects of the research - particularly in the semi-structured interviews - had to be completely voluntary. Participants also had to be made aware that they could opt out of the process at any point, and that there was no benefit to their participating in the process, nor was there any downside to not participating.

All of these aspects were outlined in an informed consent form, which was explained to all interviewees before they could choose to sign it.

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA · UNIVERSITEIT VAN KAAPSTAD

2024/06/05

EBE/00851/2024

RE: Research Ethics Committee Project Approval Letter

Dear Robert Hill,

Your application for ethics review of your project titled

Disconnected and Derailed: Re-imagining the role of Nelson Mandela Bay's commuter rail line through integration with its surrounding urban fabric

has been reviewed and evaluated by the

Engineering & Built Environment Committee.

You may proceed with your research project titled:

Disconnected and Derailed: Re-imagining the role of Nelson Mandela Bay's commuter rail line through integration with its surrounding urban fabric

Expiration date of approval: 2024/12/31

Please note that should:

(i) any serious or adverse effects to participants occur and/or,

(ii) aspect(s) of your current project change and/or

(iii) any unforeseen events that might affect continued ethical acceptability of the project occur then you should immediately report this to the approving REC. You may be required to submit an amendment to this application, in order to determine whether the changed aspects increase the ethical risks of your project.

Based on the information supplied your application has been successful and is approved.

Please note the following additional conditions associated with this approval:

(i) No further conditions.

Regards,

Engineering & Built Environment Committee.

Informed Consent Form

University of Cape Town

Statement to be read out to an interviewee about to undertake an interview for the purposes of research, as a request for permission for the name and/or identity of the interviewee to be revealed in an urban design research project.

A copy of the form can be given to the respondent should they request it.

My name is **Robert Alex Hill**, and I am studying urban design at the University of Cape Town. My contact number is 079 111 4043 and my e-mail address is HLLROB031@myuct.ac.za.

I am doing research on the **commuter railway line between Gqeberha and Kariega** as part of my master's degree programme and I would like to ask you some questions to help me with my research.

You may at any time withdraw from this interview with no consequences. You will receive no benefit by participating in this interview.

I would like to use your name, designation, and possibly direct quotations in my research project.

Please indicate "yes" or "no" below to give or withhold your permission for me to use your full name and/or designation and/or words in my research project.

Yes ☐ No ☐

Do you agree for the interview for the interview to being recorded and/or filmed and the use of your voice and image/face?

Yes ☐ No ☐

Please note any restrictions on the use of these recordings:

_____

_____

_____

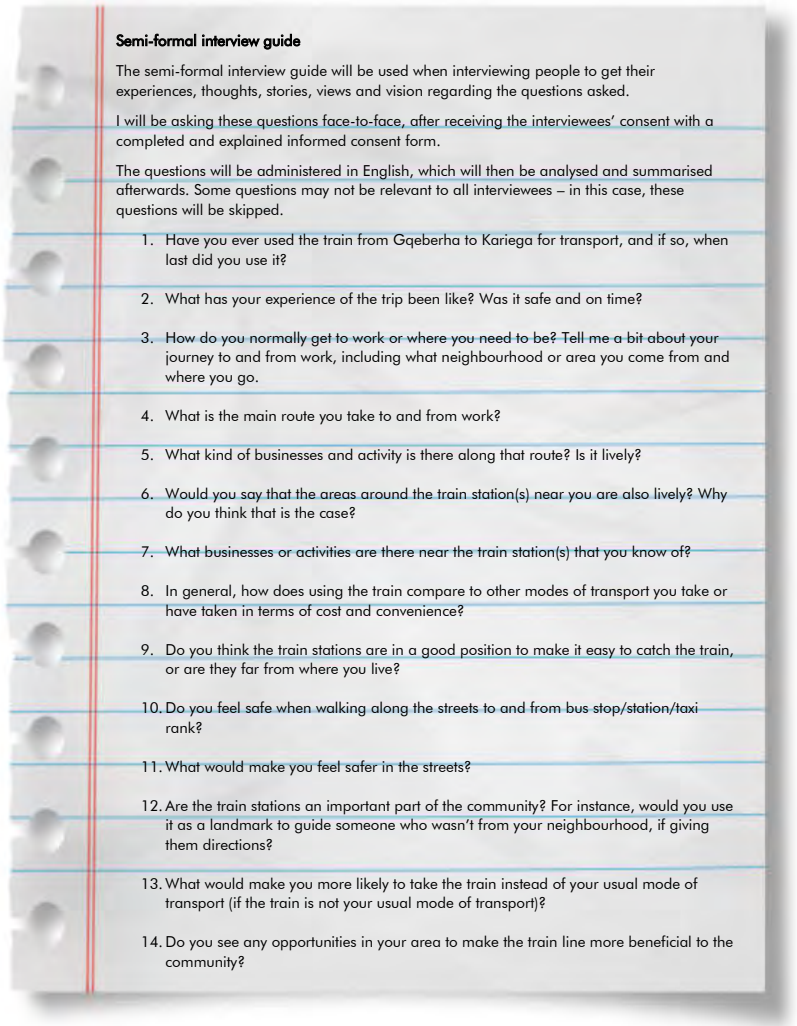
If you wish to end the interview at any point, you are free to do so. If you have any concerns about the research, you can contact my supervisor. Her name is Dr Kathryn Ewing, and her e-mail address is Kathryn.Ewing@uct.ac.za.

Participant or Representative name and signature:

_____ **Date:** _____

Student name and signature:

_____



Semi-formal interview guide

The semi-formal interview guide will be used when interviewing people to get their experiences, thoughts, stories, views and vision regarding the questions asked.

I will be asking these questions face-to-face, after receiving the interviewees' consent with a completed and explained informed consent form.

The questions will be administered in English, which will then be analysed and summarised afterwards. Some questions may not be relevant to all interviewees – in this case, these questions will be skipped.

1. Have you ever used the train from Gqeberha to Kariega for transport, and if so, when last did you use it?
2. What has your experience of the trip been like? Was it safe and on time?
3. How do you normally get to work or where you need to be? Tell me a bit about your journey to and from work, including what neighbourhood or area you come from and where you go.
4. What is the main route you take to and from work?
5. What kind of businesses and activity is there along that route? Is it lively?
6. Would you say that the areas around the train station(s) near you are also lively? Why do you think that is the case?
7. What businesses or activities are there near the train station(s) that you know of?
8. In general, how does using the train compare to other modes of transport you take or have taken in terms of cost and convenience?
9. Do you think the train stations are in a good position to make it easy to catch the train, or are they far from where you live?
10. Do you feel safe when walking along the streets to and from bus stop/station/taxi rank?
11. What would make you feel safer in the streets?
12. Are the train stations an important part of the community? For instance, would you use it as a landmark to guide someone who wasn't from your neighbourhood, if giving them directions?
13. What would make you more likely to take the train instead of your usual mode of transport (if the train is not your usual mode of transport)?
14. Do you see any opportunities in your area to make the train line more beneficial to the community?

Plagiarism Declaration

Plagiarism Declaration:

1. I know that plagiarism is a serious form of academic dishonesty.

2. I have read the document about avoiding plagiarism, am familiar with its contents and have avoided all forms of plagiarism mentioned there.

3. Where I have used the words of others, I have indicated this by the use of quotation marks.

4. I have referenced all quotations and other ideas borrowed from others using the APA referencing method

5. I have not and shall not allow others to plagiarise my work.

Signature: Signed by candidate

spes bona