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Review, Update and Consolidation of the Stellenbosch NMT Masterplan & Cycle Plan

Project Report

December 2020

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SUMMARY SHEET

Report Type	Project Report
Title	Review, Update and Consolidation of the Stellenbosch NMT Masterplan & Cycle Plan
Location	Stellenbosch Municipality
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ABBREVIATIONS

BNG	Breaking New Grounds
CWDM	Cape Winelands District Municipality
DC	Development Charge
ITP	Integrated Transport Plan
MBT	Minibus Taxi
NLTA	National Land Transport Act 5 of 2009
NLT Amendment Bill	National Land Transport Amendment Bill, 2016
NMT	Non-Motorised Transport
OLS	Operating License Strategy
PT	Public Transport
SDF	Spatial Development Framework
SDP	Site Development Plan
SM	Stellenbosch Municipality
TIA	Transport Impact Assessment
WCG	Western Cape Government

1 INTRODUCTION

1.1 Background

Stellenbosch Municipality (SM) prepared a Non-Motorised Transport (NMT) Masterplan for the municipal area and a separate Cycle Plan for Stellenbosch in 2015. The Municipality expressed the need to review and update the two plans into one comprehensive municipal NMT Masterplan, also taking cognisance of recent development initiatives. These include public transport planning, the housing roll-out, the initiatives of the Stellenbosch University, and private developments in and around town.

The Spatial Development Framework (SDF) of Stellenbosch also places a strong emphasis on walking and cycling as alternative modes of transport in the town. One of the SDFs principles is to "Pursue balanced communities", which inter alia refers to equal mobility options; i.e. ensuring a safe environment for NMT users by providing adequate infrastructure for cycling and walking.

1.2 Definition of NMT

NMT includes all forms of movement that do not rely on an engine or motor for movement. This includes but is not limited to, walking, cycling and animal-drawn vehicles and wheelchairs[1]. Walking and cycling are the more common forms of NMT usage in Stellenbosch and this is reflected in the municipal NMT Masterplan of 2020. People with 'special categories of need' are also considered[2] which includes people with physical disabilities, the elderly, pregnant women, young children, tourists, women, and load carrying passengers. Skateboarding/ longboarding has recently gained popularity among students and is incorporated. The use of animal-drawn carts such as donkey-carts is not an expected transport mode within the urban area of Stellenbosch and is therefore not addressed.

As the transport industry and urban transport environment changes, so do the mobility choices of pedestrians and cyclists. As a result, there has been an increase in the popularity of electrically assisted cycles and electrically powered personal vehicles such as electric bicycles[3] and e-scooters. Worldwide such mobility devices with a supportive power unit have become part of the urban streetscape. Potential implications thereof within the context of Stellenbosch are addressed in Section 4.6.6 of this report.

Figure 1 schematically depicts the definition of NMT used in this report.

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1 Department of Transport, NMT Facility Guidelines, 2015.

2 National Land Transport Act, 2009.

3 The term electric bicycle is generic and includes pedelecs, e-bikes and combinations of these types. Pedelec refers to a bicycle with a motor that only functions on condition the cyclist pedals, whilst e-bike means a bicycle with a motor that functions by turning the throttle, so irrespective of the cyclist pedalling.

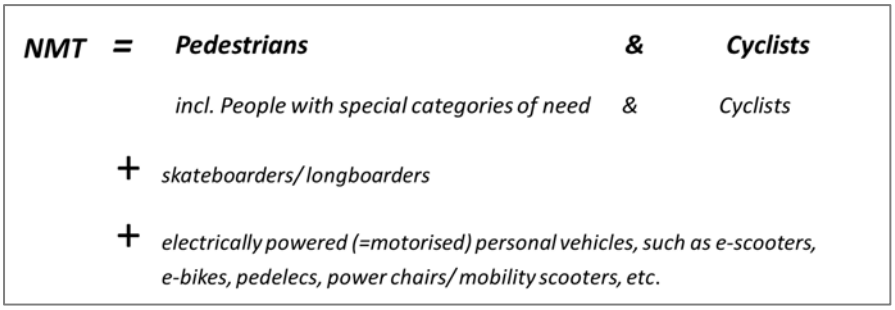


Figure 1: Definition of NMT

1.3 Project Objectives

The primary scope and objective of the project is the consolidation of Stellenbosch's NMT Masterplan and Cycle Plan (both prepared in 2015), the update thereof and the development of an implementation plan, as well as the preparation of NMT strategies and policies.

1.4 Study Area

SM is a local municipality of the Cape Winelands District Municipality (CWDM). It is landlocked within the Western Cape Province with the City of Cape Town bordering on the southwest, the Drakenstein Municipality to the northeast and the Helderberg Mountain Range along the east.

The study area comprises the boundaries of the Stellenbosch Municipal area. Stellenbosch town is the primary urban centre within the Stellenbosch local municipality.

The study area for the development of the NMT Masterplan covers Stellenbosch town which includes Kayamandi, Cloetesville and Idas Valley in the north, as well as Jamestown in the south, and the smaller outlying towns such as Franschhoek, Klapmuts and Pniel. Refer to Figure 2.

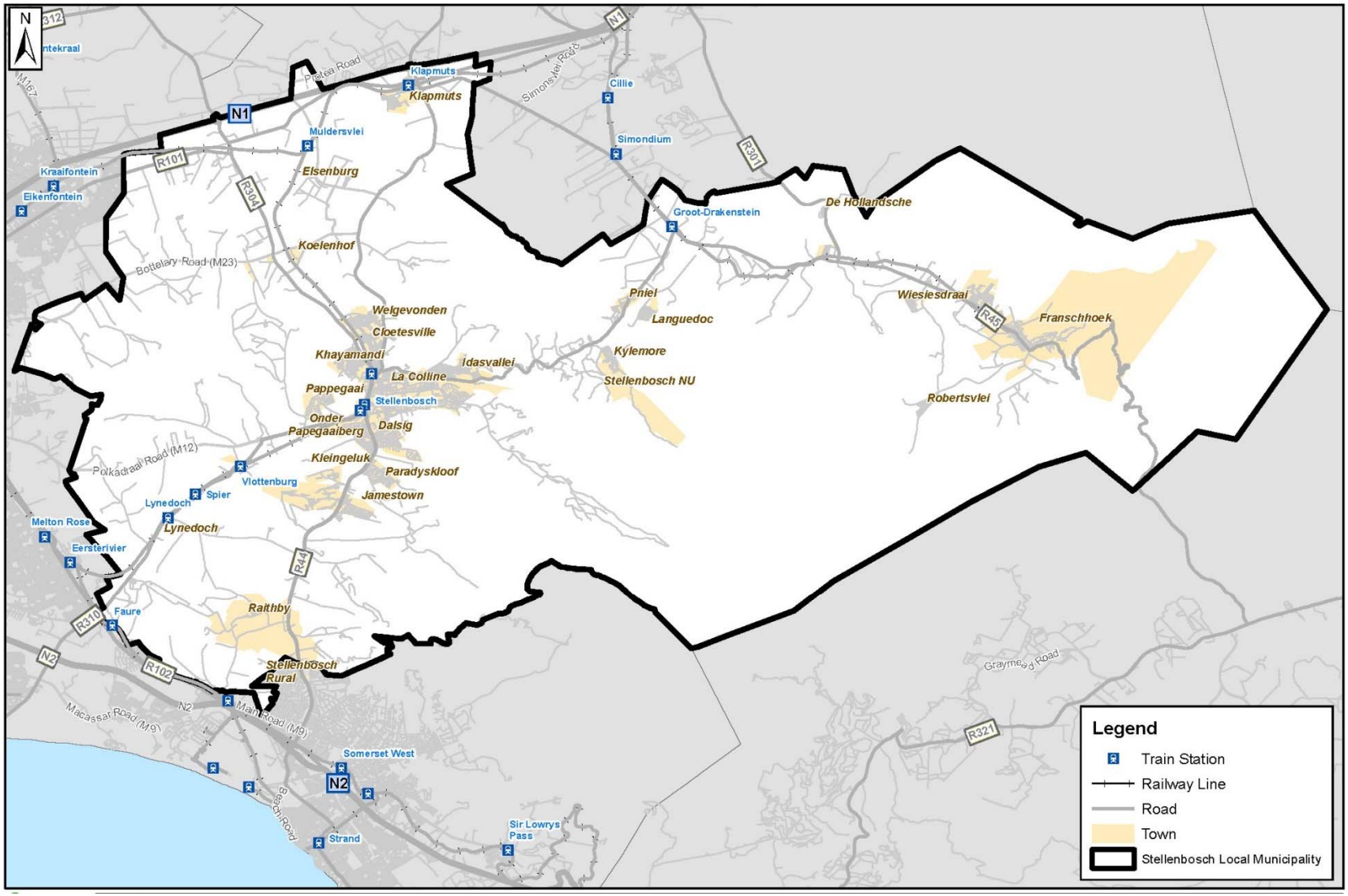


Figure 2: Map of Stellenbosch Municipality

1.5 Report Structure

The report outlines the

- Project **Methodology** (Chapter 2),
- summarises the findings of the **Contextual Analyses** (Chapter 3),
- describes the **Vision and Strategies** (Chapter 4),
- documents the principles of the **Network Development** (Chapter 5),
- details the **Implementation Plan** and provides a cost estimate thereof (Chapter6), and
- concludes with a **Summary** (Chapter 7).

2 METHODOLOGY

An integrative approach was adopted for the review and consolidation of the NMT Masterplan. Various projects and plans have been ongoing for a number of years in SM. With this project the approach was to review all, assess and compare with recent planning and development trends, for inclusion in the NMT Masterplan 2020.

In particular, the recent trends in the spatial development of Stellenbosch as encapsulated in the Stellenbosch SDF as well as the strategic intent of the Integrated Transport Plan[4] pushing Stellenbosch' transport future towards sustainable transport modes, were used as a reference. The role and place of NMT users in the transport system are strongly influenced by the approach and intent of spatial and land use planning initiatives.

2.1 Stakeholder Consultation

Various stakeholders and role-players were approached to identify issues and concerns, as well as opportunities of NMT in SM. Consultation for this project was undertaken at various levels and included the following role-players

- Discussion with the various line departments of SM to discuss current integration with NMT and to identify future collaboration.
- Discussion with Province about pedestrian and cyclist treatment along provincial roads.
- Meetings with the Stellenbosch University.
- Workshop with the Stellenbosch NMT Forum including a site visit.
- Project Team Meetings with the client.
- Discussion of NMT Policy and Strategies at the Municipality's Transport Forum.

The form of consultation was impacted by the national lockdown due to Covid-19 and discussions were held virtual.

2.2 Desktop Study

Planning for pedestrians and cyclists in the SM has come a long way, which inter alia includes the SM NMT Master Plans (first prepared in 2009 and updated in 2015), the NMT Framework prepared by the Cape Winelands District (also 2009), the Cycle Plan for Stellenbosch town (2015), and the Stellenbosch University's (SU) Transport Plan (2017) and SU SDF (Draft 2020). The NMT Masterplan of 2020 presents the consolidated, reviewed and updated network of the previous work.

The following information was collected and served as informants:

- Stellenbosch Municipality: NMT Network Plan, 2015
- Stellenbosch Municipality: Cycle Plan for Stellenbosch town, 2015

[4] Stellenbosch Municipality, CITP, 2020 update - currently under review

- Western Cape Government and Stellenbosch Municipality: Non-Motorised Transport in Stellenbosch Municipality, NMT Inventory and Infrastructure and Upgrade Priorities (as part of the Provincial Sustainable Transport Programme (PSTP)), Draft Report, October 2018.
- Stellenbosch Municipality: Roads Master Plan, August 2019
- Stellenbosch Municipality: Transport Safety Master Plan, 2015
- Stellenbosch Municipality, Spatial Development Framework, November 2019
- Stellenbosch Municipality, Non-Motorised Facilities in Jamestown, May 2020 (prepared by AECOM)
- Stellenbosch Municipality: Disability Accessibility Study on Municipal Buildings, Infrastructures & Procedures, 2015
- Stellenbosch Municipality, Pedestrian and cyclist traffic counts of 2019.
- Stellenbosch Municipality: Housing pipeline, 2020
- Stellenbosch University: Spatial Masterplan, Draft May 2020
- Stellenbosch University: Integrated Transport Plan, 2017
- Stellenbosch Municipality: Neighbourhood Urban Design Guideline for Dennesig, August 2019
- Adam Tas Corridor Plans and other private development initiatives

2.3 Site Visits

Site visits were also undertaken on various occasions to identify the current state of infrastructure and the NMT desire lines. The Municipality had commissioned audits and assessments of all existing pedestrian and bicycle infrastructure, these audits were an important source of information when determining of the extent of the NMT network. The municipality is current in the process of documenting and mapping the type, condition, and location of all existing pedestrian and bicycle facilities.

3 CONTEXTUAL ANALYSES

3.1 Spatial Structure and the Crossing of Infrastructural Barriers

The legacy of apartheid spatial planning in SM is that of poor black and coloured communities are located on the periphery of Stellenbosch, resulting in long and unsafe travel distances to the places of work, schools, shops and recreational opportunities.

The highest pedestrian activity in Stellenbosch Town is observed **in and from the neighbourhoods of the historically disadvantaged communities situated on the outside of Stellenbosch** (Kayamandi, Cloetesville, Idas Valley) towards the CBD. They are located well within walkable distances (2-3km) from the CBD and streams of people can be seen walking to and from the CBD. The main pedestrian movements are predominantly commuters travelling towards the CBD thereby having to cross or walk along significant roads and intersections. Some of the critical intersections, which were highlighted as pedestrian hazardous location in the consulting process, are for example: the Adam Tas/ Bird Street intersection, the Helshoogte/ Cluver intersection, the pedestrian desire line from Kayamandi to the schools located in the nearby Cloetesville at the R304), and the Van Rheede/ Strand Rd (R44) intersection. People from Jamestown have to travel further (approx. 5km) and also have to walk along a major mobility route (Strand Road/ R44).

The pedestrian desire line from Kayamandi to the CBD and Bird Street, across the railway line, is currently the most direct route to get to the CBD. This route is along Rand Street and across the railway line, passing a local shopping hub, a local market, an informal public transport rank at Du Toit Station, making it very desirable. However, the informal crossing of the railway line is unsafe (refer to Figure 18). The alternative route is along the R304, but it is not aligned with the desire line and too far from where people need to be. The SM officials report that previously PRASA stated that they do not support the formalisation of pedestrian level crossings. However, as this is possibly the strongest pedestrian desire line in Stellenbosch, an improved solution is required to improve dignity to the people of Kayamandi.

Figure 3: Kayamandi: Main desire line crosses the (unsafe) at-grade crossing at Du Toit Station

The residential areas of Kayamandi, Cloetesville and Idas Valley are further separated by the R304 (Kayamandi and Cloetesville) and the R44 (Cloetesville and Idas Valley). People cross these roads to attend school, sportsfield and places of work. The people from Idas Valley has to cross Helshoogte Road to access schools, places of work, etc.

This pattern is also evident in Franschhoek with the residents of Groendal having to walk along the R45 towards Franschhoek CBD. A shared pedestrian and cycling footpath has been provided to provide a safe route.

3.2 Land use, Pedestrian Attractors and Generators

Within the wider Stellenbosch municipal area, **Stellenbosch Town** is the main core of activity mainly due to its heritage and touristic charm of the CBD embraced by a quaint street café culture, as well as the location of various work opportunities. Particularly the location of the main campus of Stellenbosch University (SU) has a significant impact on movement patterns. SU is with more than 30 000 students on campus the largest trip generator and one of the largest landowner within Stellenbosch Town.

Significant pedestrian attractors and generators in Stellenbosch Town include the following:

- Stellenbosch University and Coetzenburg sportsground
- Stellenbosch CBD area
- Stellenbosch rail station
- Provincial hospital
- School precincts located east and south of the CBD area
- Plankenburg industrial area
- Technopark

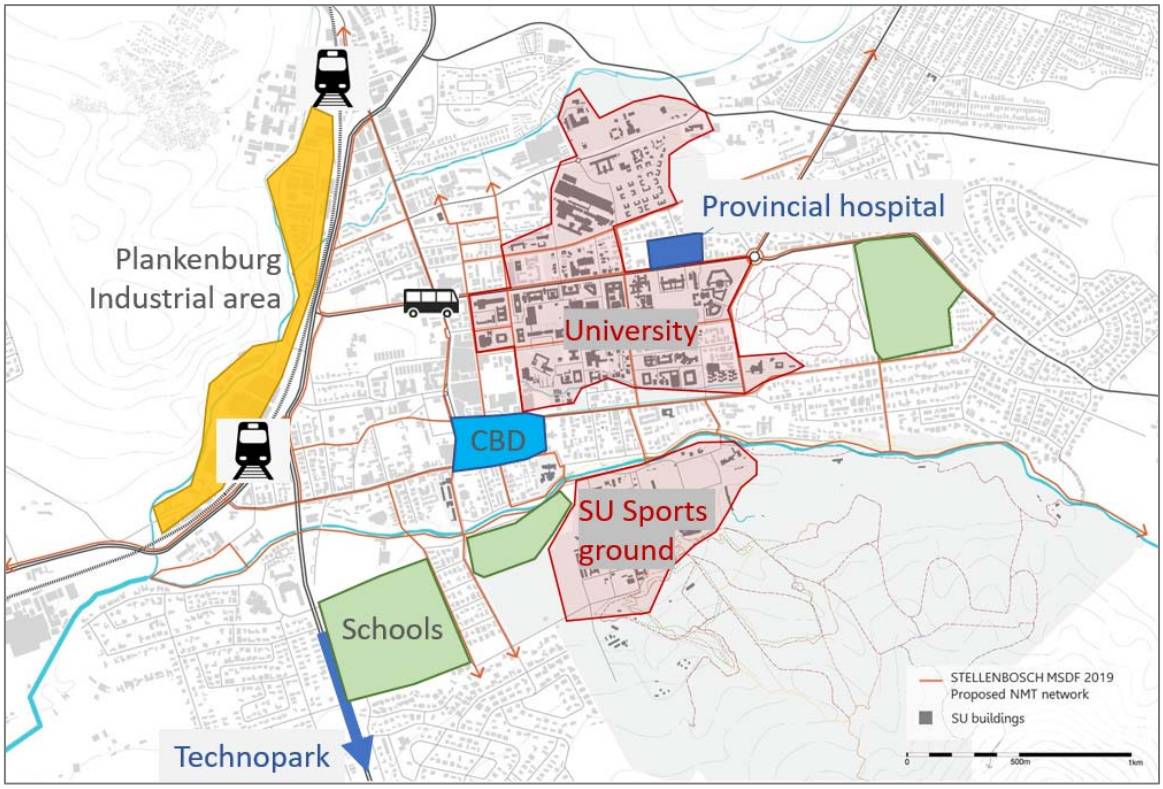


Figure 4: Stellenbosch Town: Land Use and Pedestrian Attractors & Generators

Central Stellenbosch therefore attracts large numbers of commuters, learners, students as well as local and international visitors. High levels of walking and cycling are especially generated from the previously disadvantaged communities.

Walking and cycling levels in the **other local settlements** within the Stellenbosch Municipality such as Pniel and Klapmuts, are predominantly internal and include learners walking to school, people walking to the nearest public transport (PT) stop, and people going to the local shop and/or clinic. Some pedestrian desire routes cross main arterials and railway lines, which is a safety risk. Refer to Figure 6 and Figure 8.

Franschhoek has a special status in that it is very popular with tourists displayed in high pedestrian volumes in the CBD area along the main road (see Figure 5).

Figure 5: Franschhoek: Raised pedestrian crossing in CBD

Figure 7: Klapmuts: Traffic calming in front of clinic

Figure 6: Koelenhof: Unsafe at-grade rail crossing

Figure 8: Vlottenburg: Pedestrian desire line across Polkadraai (M12) towards local shop

3.3 Integration with Public Transport

Many people have to make use of public transport to participate in economic activities. This is especially true for those who stay in rural areas of SM where walking distances to the various work places are too extensive. Walking is an important part of a PT journey as most people walk to and from the nearest PT stop on either side of their journey (in the absence of safe bicycle locking facilities and convenience to transport a bicycle on the vehicle). The integration of PT and NMT is therefore essential to result in a seamless journey experience. This inter alia refers to the location of PT stops, placement of (bus) shelters (to not obstruct sidewalk space), and adequate NMT paths that are wide enough and offer direct and safe routes to the final destination.

The minibus taxi (MBT) is the dominant public transport mode in SM primarily due to its flexibility and ability to adapt to different passenger demands between towns, neighbourhoods and more rural farm areas. Figure 11 depicts the MBT routes and the locations of formal ranks in Stellenbosch town, as well as the Stellenbosch railway station. It is evident that there is some kind of pedestrian infrastructure provided. From site visits it was however observed that sidewalk infrastructure is in most cases inadequate in terms of width, safety, and security.

PT integration in the local settlements are relatively poor as well, as the examples of Klapmuts and Wemmershoek indicate (refer to Figure 12 and Figure 13 respectively). Also see images of existing sidewalk infrastructure (Figure 9 and Figure 10).

Figure 9: Good example of pedestrian crossing at Stellenbosch station

Figure 10: Klapmuts taxi rank. Fence installed across full sidewalk width.

Most MBT routes in SM are either destined or originated from the main MBT facility called **Bergzicht MBT rank** which is located in the CBD area of Stellenbosch Town. As the majority MBT routes typically end at Bergzicht rank, large volumes of pedestrians are observed throughout the day. Adequate pedestrian accommodation is not reflected in the current operation and layout of the intersection at Merriman Ave/ Bird St. Improved management and pedestrian integration is required. The same is true for the **Kayamandi MBT rank** which is the second busiest PT hub in Stellenbosch Town. The rank is located just west of the R304 and north of the roundabout Masitandane Rd/ Rand St which is a frequented road, particularly used by heavy vehicles accessing the industrial area along G Blake St. Improved pedestrian infrastructure is required along Masitandane Rd.

The access to **Klapmuts** rail station is along an off-road pedestrian facility in the Klapmuts river bed. This majority of the route needs to be formalised and parts of the existing infrastructure need to be upgraded to adequately accommodate the high volumes of pedestrians. The recently built taxi rank north of the Klapmuts Community Centre requires designated pedestrian infrastructure that safely guides pedestrians and passenger with special needs to the pick-up/ drop-off areas.

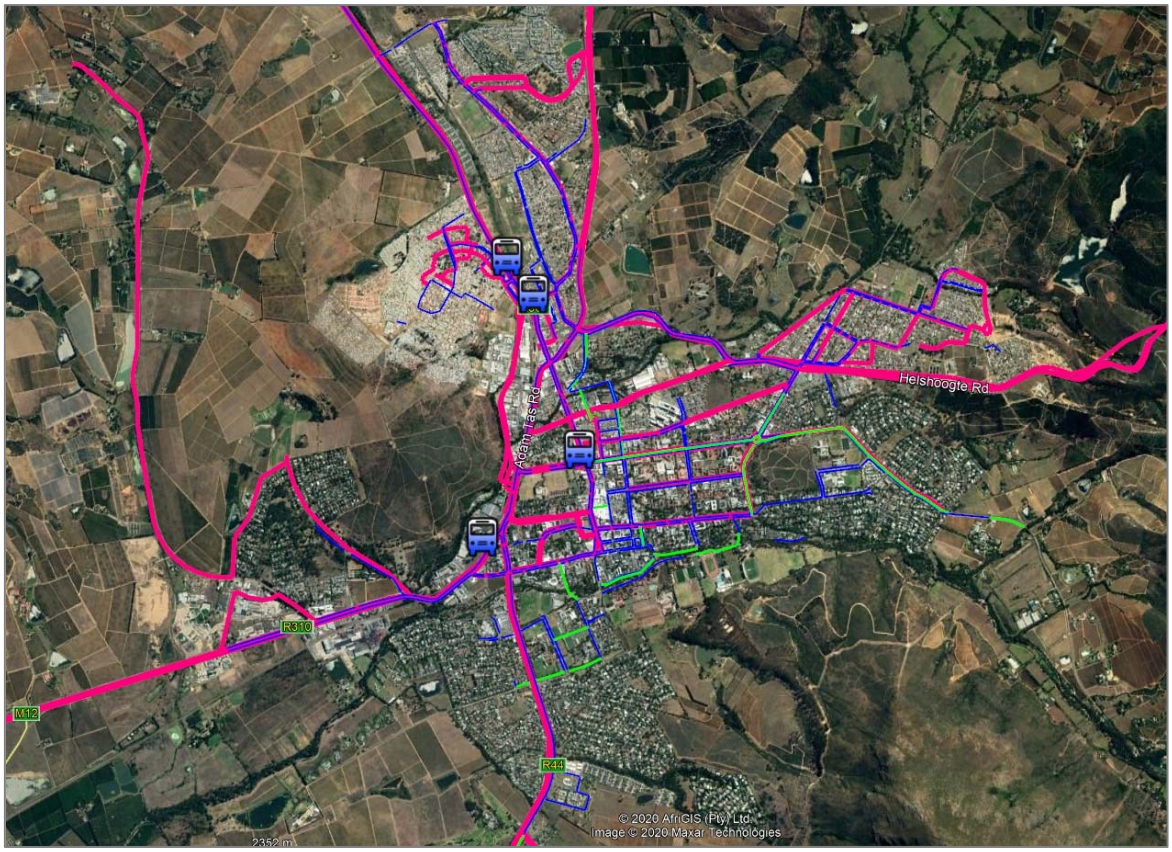


Figure 11: MBT routes & formal ranks (in pink) and integration with existing NMT facilities

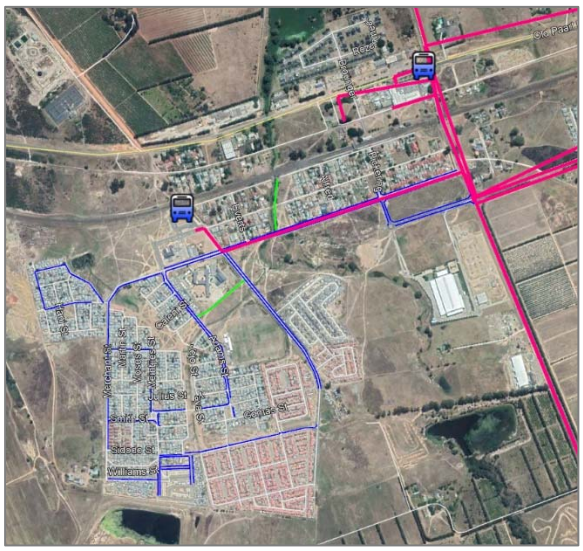


Figure 12: Klapmuts: Current integration with PT is poor

Figure 13: Wemmershoek: Current integration with PT is poor

There are seven railway stations which fall within the Stellenbosch Municipal area; namely: Klapmuts, Muldersvlei, Koelenhof, Du Toit (close to Kayamandi), Stellenbosch (Central), Vlottenburg and Lynedoch. There is an understanding that there has been a significant decline in rail usage over the past few years. This decline has been due to poor service and declining rolling stock and infrastructure. This modal shift has largely been to MBT.

Nonetheless, pedestrian routes to and from railway stations form important links. This is also against the backdrop of initiatives that recommend the upgrade of the current system to improve intra-municipal rail movement.

3.4 Learners and Schools

Children are specifically vulnerable and safe routes to school are essential to ensure the safety of learners. Attempts have been made by SM to provide physical infrastructure such as speed humps in front of schools and it was also observed from site visits that scholar patrol programmes are underway.

However, current limitations such as inadequate sidewalk width near school entrances, as well as safe crossing points at major roads need to be addressed. A local area network around schools is fundamental. The 2020 NMT Masterplan propose a number of interventions to enhance scholar safety.

Figure 14: Cloetesville: Sidewalks close to schools are too narrow

Figure 15: Koelenhof: Lack of safe crossing opportunity along desire line to/ from local school

3.5 Existing NMT Movement Patterns

3.5.1 Outlying areas to Stellenbosch CBD

Pedestrian counts undertaken in 2019 confirm the order of magnitude of NMT volumes. Refer to Figure 16. It is evident that the major NMT streams originate in the north-west of Stellenbosch Town. There are about 2 000 people walking from Kayamandi towards the CBD crossing at the Bird St/ R44 intersection. This is enormous and reflected in the high pedestrian casualties at this location[5]. There are also a high number of commuters and students arriving by train, on average 600 people walk from Stellenbosch Station towards the CBD. The majority thereof walks along Stasie St and Heynike Lane connecting to Mark Street. Residents of Cloetesville prefer to cross at Helshoogte Rd/ R44 which is also identified as a hazardous location. There are about 300 people crossing the road on their way towards the central parts of Stellenbosch. The volumes from Idas Valley are of similar order. Approximately 300 people cross at the formal crossing at Cluver/ Helshoogte Rd. It was observed that there is a significant informal crossing east of the formal crossing. Particularly learners cross here as it is the direct route towards the schools in Simonswyk.

Note that there is no count information available along the south access routes (from Jamestown) and along George Blake Rd towards Merriman Ave (alternative route from Kayamandi, specifically Enkanini settlement). Site visits confirmed that these are also significant NMT routes. Strong desire lines were observed north and south of the Kayamanid sports stadium

The overall cycling share of all four count locations was observed at 4%.

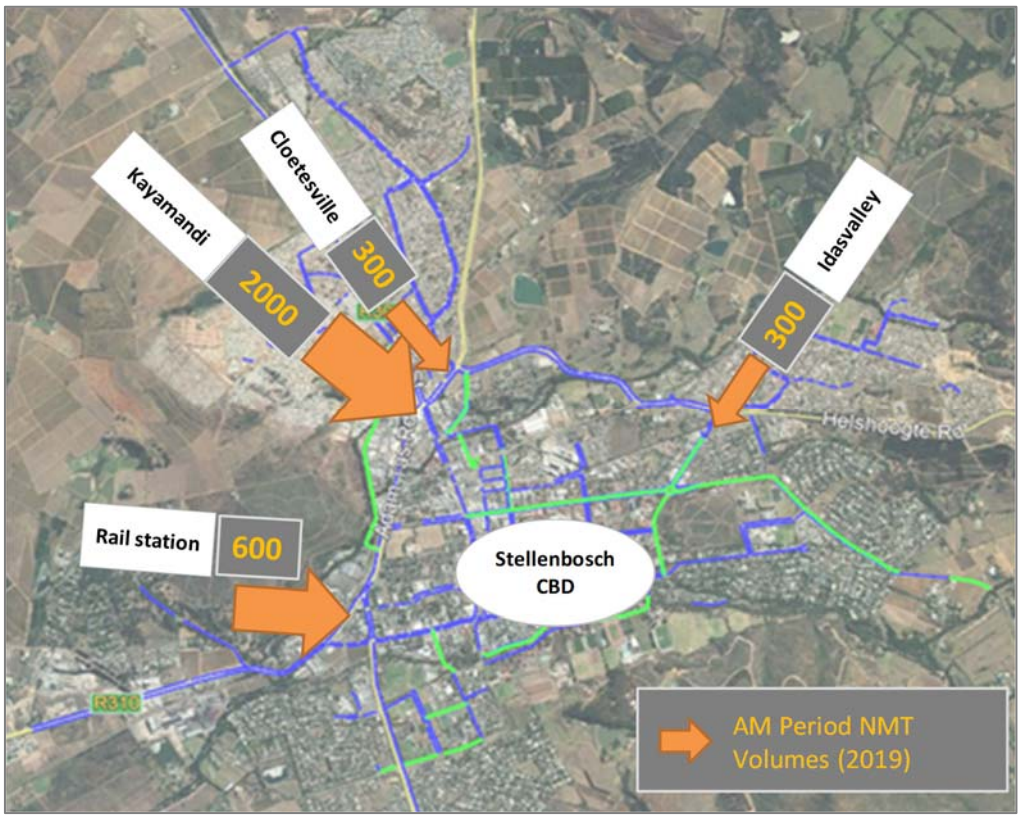


Figure 16: Extent of pedestrian volumes (AM peak period, 2019)

[5] Stellenbosch Municipality: Transport Safety Master Plan, 2015

3.5.2 Stellenbosch CBD

Stellenbosch CBD attracts high volumes of pedestrians mainly due to the large student population and due to its "old town" which has become a tourist hub. In particular, Dorp Street, Andringa Street and Church Street create a pedestrian-friendly atmosphere with many restaurants spilling over into the street.

The University of Stellenbosch (SU), responsible for the huge student population living in the town, encourages students to walk between campuses and residences. The main desire lines are from the Engineering faculty and residences north-east of the main campus towards the Central Campus. Currently there is no direct at-grade link provided but there is a pedestrian bridge which is however not UA accessible. Students prefer at-grade crossings and most of them cross at Merriman/ Bosman (signalised) and Merriman/De Beer. The latter one is only a unsignalised crossing which is very unsafe.

Other significant desire lines are observed from the sports grounds in the South to the main Campus (along Die Laan/ Bosman and Coetzenburg/ De Waal), as well as along Victoria St (sidewalk on the northern part is currently being upgraded), along Soetweide and along Ryneveld St.

Figure 17: Kayamandi: Rand St is a high activity route which requires pedestrian priority

Figure 18: Kayamandi: Main desire line crosses the (unsafe) at-grade crossing at Du Toit Station

Figure 19: Kayamandi: Informal path leading up to the higher lying areas

Figure 20: Stellenbosch town: Raised pedestrian crossing at Ryneveld St

Figure 21: Stellenbosch town: Crossing of Merriman Ave at De Beer St

3.5.3 Other local towns in the municipal area

The residents of the **other local towns in the municipal area** are often seen walking along major provincial roads. Particularly those NMT movements are from the poorer communities towards the town centre (e.g. Groendal and La Motte towards Franschhoek CBD). Currently strong NMT desire lines are also observed leading to the local MBT rank.

Site visits observed strong desire lines from the south of Klapmuts settlement towards the railway station and towards the shopping area located a bit further north at the intersection of the R44 with the Old Paarl Road (R101). People prefer to walk in the river bed of Klapmuts river, where portions of an off-road pedestrian facility have been formalised already. The total length of the desire line along the river is approximately 1km.

Figure 22: Klapmuts: Good example of existing off-road NMT facility

3.5.4 Cycling

Cycling is prominent in Stellenbosch but is dominated by recreational cycling, particularly by road cycling. These cyclists typically favour the high-order provincial roads – Stellenbosch Arterial, the R304, Helshoogte Road and the R45 towards Franschhoek. Portions of a cycle network is implemented along certain sections of roads by warning motorists that cyclists frequently use the shoulder to cycle in. However, there is no coherent cycling network.

3.6 Quality of Infrastructure

3.6.1 Overview

The construction of the pedestrian and cycle networks as per the CITP recommendations has been limited resulting in fragmented routes and slow roll-out times. Specifically, the cycling network in Stellenbosch CBD is incomplete. Also, people with special needs are confronted with a lack of dropped kerbs at crossings as well as a lack of tactile detection guidance surfaces at pedestrian crossings. This is of specific concern in CBD areas. Sidewalk space is also often obstructed by mis-placed street furniture.

Generally, walking and cycling is not safe with the ever-increasing traffic, which, if not moving, is a hindrance in terms of parked cars obstructing sidewalks. Intersections are in favour of vehicles and pedestrian crossing movements are not well addressed.

The priorities of modes in poorer neighbourhoods leans also towards vehicle movement, despite the fact that the majority of people living there are dependant on walking. The encroachment of houses up to the roadway forces pedestrians and children to walk in the road. From site visits it was also observed that the informal parts of low income areas extend high up towards the mountain side, which makes access very difficult, especially on a gravel path during the rainy season.

3.6.2 Stellenbosch Municipality

Sidewalks make up 80% of the existing NMT infrastructure in the **whole municipal area of Stellenbosch**. There are approximately 120km of sidewalks and 30km of cycle infrastructure. Of that, more than half is located in Stellenbosch town and surrounds. Refer to Table 1.

Table 1: Network Extent of pedestrian and cycle routes

	Whole Stellenbosch Municipality **Length (km)**	**Stellenbosch Town** (incl. Kayamandi, Jamestown) **Length (km)**
Existing Sidewalk	119	76
Existing Cycle Class 1	2	1
Existing Cycle Class 2	22	9
Existing Cycle Class 3	5	5
Total (km)	**148**	**91**

Note:
1) Cycle Class 1 is located outside of the road reserve and shared by pedestrians and cyclists.
2) Cycle Class 2 is located within the road reserve but separated from the roadway by level difference/kerb. Within SM ,Class 2 facilities are shared by pedestrians and cyclists.
3) Cycle Class 3 is a bicycle lane that forms part of the street or the carriageway and is marked accordingly. Refers to centreline length.

Roughly 30% of all roads in the **whole municipal area** have sidewalks at least on one side of the road. The condition of sidewalks varies quite significantly. It was observed that regular maintenance is a challenge. The majority of bicycle infrastructure is provided as shared facilities with pedestrians (approximately 75%). In most cases however, the sidewalks and cycle facilities are too narrow for the observed volumes and lack continuity (ito condition and connectivity). Figure 23 indicates the reasonably well coverage of sidewalk infrastructure in Pniel and Kylemore but also highlights missing links. For example, the connection from the local settlements of Wemmershoek and La Motte to the main road (R45) needs to be provided for.

Figure 23: Kylemore/Pniel/ Franschhoek area: Extent of existing cycle facilities (green) with existing sidewalk infrastructure (blue)

Improvements to the pedestrian and bicycle network of the **local towns of SM** area have been carried out but are limited to shared pathways with pedestrians. Most of the paths are however too narrow and are not well maintained. Especially in poorer communities, NMT infrastructure needs to synergise with adjacent public amenities such as play parks. Considering pedestrian priority streets in such areas will go a long way.

Figure 24: Wemmershoek: Informal path to school

Figure 25: Klapmuts: Off-road NMT facility provided but lack of lighting and insufficient width

3.6.3 Stellenbosch Town

Despite limited budget allocations and resources, Stellenbosch Municipality, along with parallel initiatives of the Western Cape Government and Stellenbosch University, has managed to implement some strategically important projects. Most notably, some of the more recent pedestrian and bicycle facility upgrades include inter alia the shared NMT facility along the R44 from Jamestown to Blaauwklippen Road, the NMT path along Marais Street and the widening of sidewalk space along Victoria Rd (still under construction). Further achievements include traffic calming around schools as well as in the CBD area and providing pedestrian signal priority at some intersections.

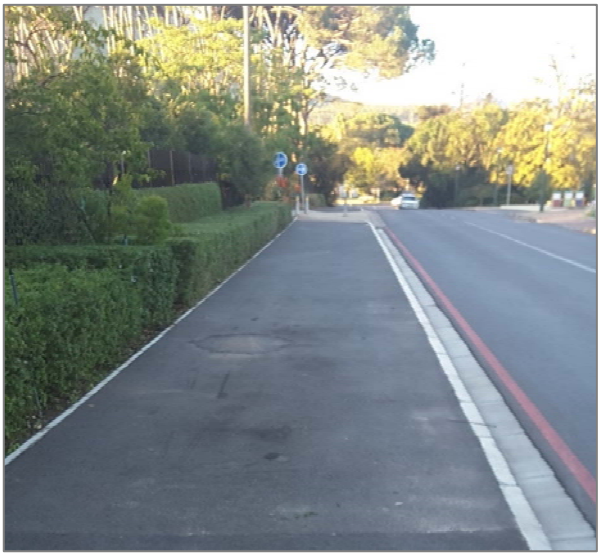


Figure 26: Stellenbosch town: Good example of a shared facility for pedestrian and cyclists that is of sufficient width (Marais St)

Figure 27: Jamestown: Recent upgrade of the NMT route along the R44 to the CBD

Figure 28: Good example of pedestrian walkway in a CBD environment (Eikestad Mall, Stellenbosch Town)

The majority of pedestrian and bicycle infrastructure investment has taken place in the town of Stellenbosch with limited facilities available in the suburbs located on the outskirts of the town (specifically in and around Kayamandi). Refer to the figures below. Figure 30 the lack of bicycle infrastructure in Stellenbosch Town.

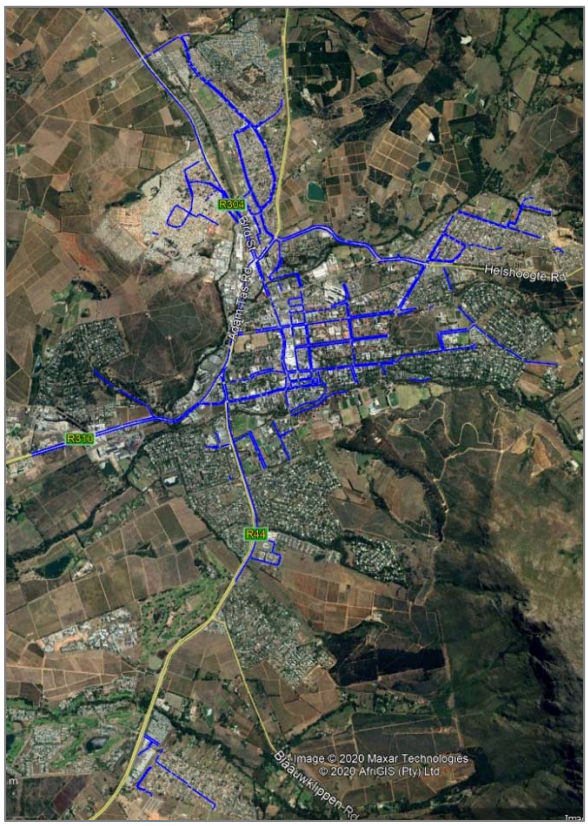


Figure 29: Extent of existing sidewalk infrastructure in Stellenbosch town and surrounds

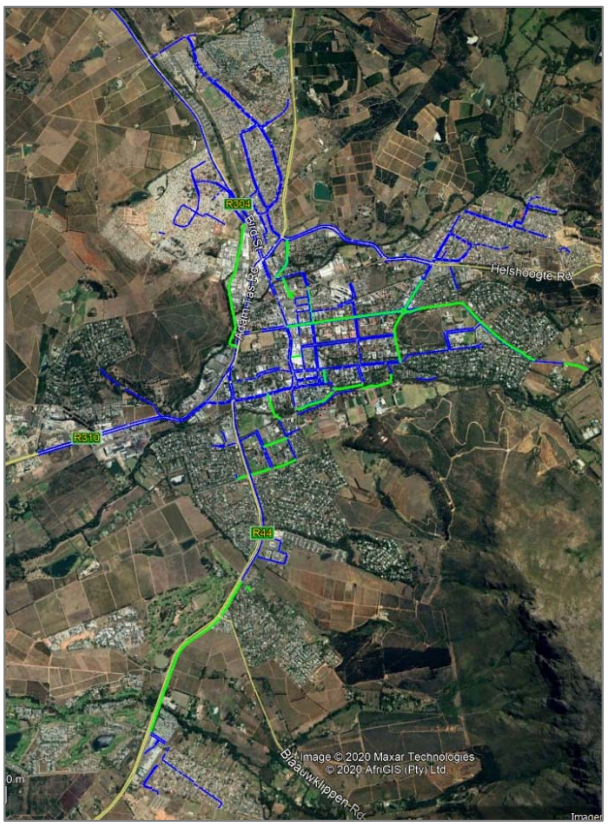


Figure 30: Overlay of existing cycle facilities (green) with existing sidewalk infrastructure (blue) in Stellenbosch town and surrounds

Along arterial routes into Stellenbosch, the extent and quality of provision for walking and cycling varies considerably (from outlying neighbourhoods into the CBD). Around Stellenbosch there some critical missing pedestrian and bicycle links that present serious concerns and prevent safe walking and cycling for a large population of Stellenbosch. Incomplete pedestrian and bicycle infrastructure, inadequate and missing links connecting Jamestown[6], Welgevondon and Vlottenburg to Stellenbosch town are the most critical that require urgent implementation. An investigation into the potential of cycling in Stellenbosch Town in 2015[7] indicated that the main barriers to cycling are traffic safety, the lack of cycling infrastructure and personal safety concerns. Only a complete urban network that provides safe and direct routes will have the impact to increase the status and utilisation of NMT, in particular cycling.

[6] The recent implemented segment from Jamestown still requires upgrading of the existing links further north towards the CBD.

[7] Stellenbosch Municipality, Cycle Plan for Stellenbosch Town, 2015.

3.7 Future Developments and NMT access

3.7.1 Integration with Future Developments

There are significant development proposals underway, that have the potential to positively impact NMT usage. Some of the more significant areas of future growth are described hereafter.

The redevelopment opportunity along **Adam Tas Corridor** (ATC) in Stellenbosch Town stands out by far. The corridor stretches from the Droë Dyke and the Old Sawmill sites in the west along Adam Tas Road and the railway line, to Kayamandi, the R304, and Cloetesville in the north (total extent of approximately 3.7km along Adams Tad Road/ R310). Refer Figure 31. One key proposal includes the reconfiguration of the corridor to obtain a balance between private vehicle, public transport and NMT access along and across the corridor. A specific focus is on improved pedestrian access. This can further be seen in the conceptual proposals for Kayamandi which is identified as Phase 1. The proposals include the formal activation of G Blake St/ Rand St as a commercial hub and to create a mixed-use hub linking Kayamandi with the rest of Stellenbosch. It further acknowledges the safety risk of the current at-grade link across the railway line and proposes a re-location of the station north of the taxi rank on the opposite side of the railway tracks (refer to Figure 32). These proposals are however medium to long term (specifically wrt relocation of the Du Toit station), which the 2020 NMT Masterplan addresses by highlighting short term measures.

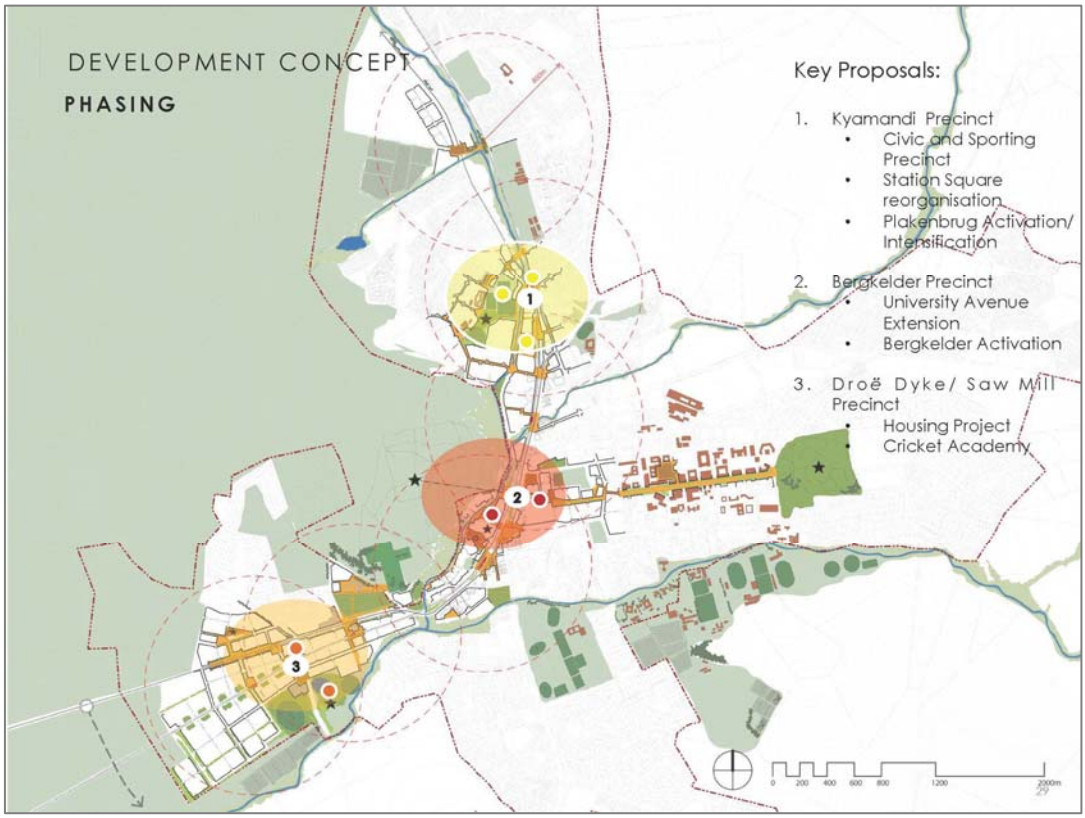


Figure 31: Adam Tas Corridor – Proposed Development Phasing (Source: GAPP 2019)

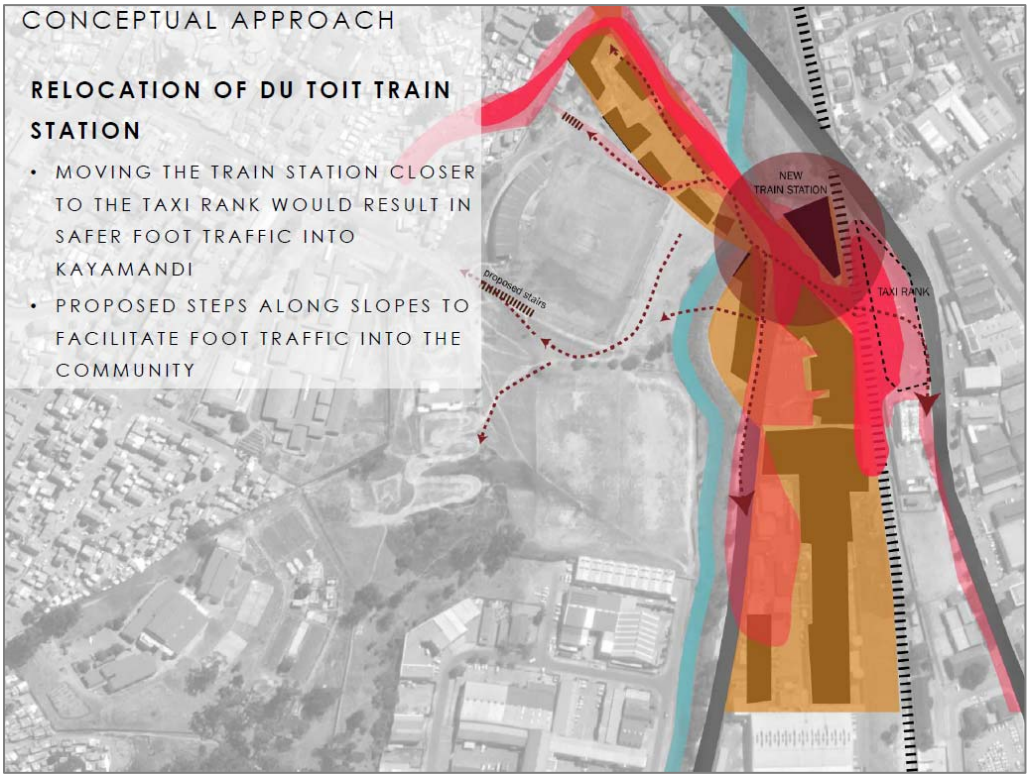


Figure 32: Renewal of Kayamandi as part of the ATC proposal, Phase 1 (Source: GAPP 2019)

Klapmuts has also been identified as a growth node with the following two major developments:

- Distell has relocated many of its operations to Klapmuts north of the N1. The project proposals also include commercial and mixed-use developments. This area forms part of Drakenstein Municipality and collaboration with SM is required to ensure that NMT routes connect.
- The Stellenbosch University, along with other private developers, plans to establish an innovative hub west of Klapmuts (Smart City developments). Due to the nature of those developments, significant NMT volumes are expected in future. It is important that those routes connect to the overall NMT Network for Klapmuts.

Overall, future densification efforts similar to that in Dennesig neighbourhood, will create a pedestrian friendly environment and should be encouraged.

3.7.2 Integration with Stellenbosch University

SU is a significant stakeholder in Stellenbosch Town and promotes the development of pedestrian and cycle routes. Figure 34 indicates the level of walkability between the different parts of the campus. It is evident that there is high potential for walking, but even more so for cycling and skateboarding as distances between faculties can be up to 2km-3km which is an ideal cycle distance. Cycling however is not very popular currently, with some of the reasons listed below:

- Relatively high levels of crime. This particularly relates to personal safety in the evening hours and the theft of bicycles.
- Bicycle parking is insufficient and needs to be expanded. This refers to the location and type of parking facility.
- Skateboards/ longboards are more frequently used, most probably due to their cool/hip status.

- Similarly, Uber rides are experienced as more convenient than walking or cycling.

SU also runs a shuttle service which addresses those longer trips. The service currently consists of a day and evening shuttle service (fixed routes, stops, schedules) which links the general parking areas on the edge of campus with the central campus but without crossing the central campus (Merriman Ave).

In discussion with the SU, it was indicated that (student) parking is of concern, specifically around the Central Campus. Often, sidewalks are blocked by parked cars. Refer to Figure 33. A lack of law enforcement was noted.

Figure 33: Stellenbosch town: Uncontrolled parking which results in unusable sidewalk space (Die Laan, image above) and unsafe parking manoeuvres (Marais Street, image to the right)

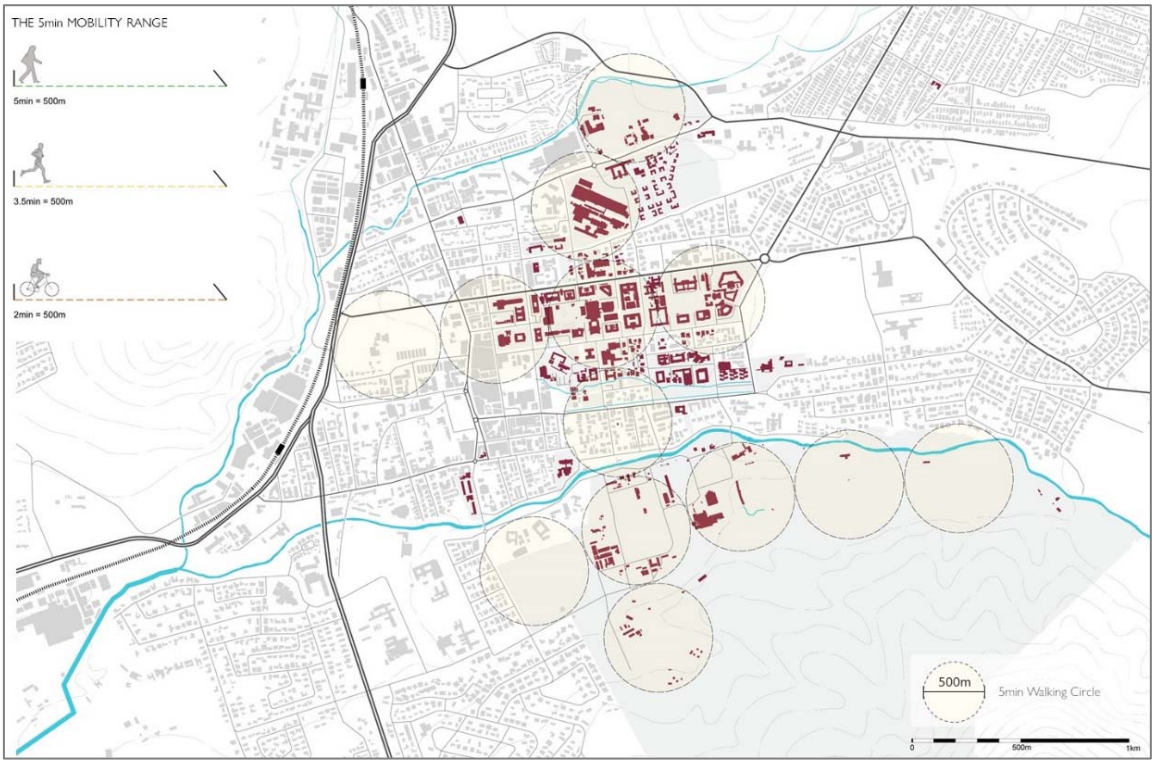


Figure 34: Stellenbosch University: Walkable Campus (Source: SU, 2020)

Despite the above mentioned challenges, the University plays an important role in the uptake of NMT and has identified three levels of routes that make up the SU NMT network. These routes were developed as part of their Spatial Development Framework (Status of report: Draft June 2020) and are categorised as: 1) internal primary, and 2) internal secondary routes on campus and 3) routes that run along municipal roads. Refer to Figure 35. The proposals include the pedestrianisation of some of the University's privately owned streets and providing slipways for UBER. The University indicated that the following municipal street links are of specific priority (in no particular order):

- Victoria Street, east of Bosman Street (upgrade of sidewalk currently underway to ensure UA compatibility)
- Victoria Street, west of Bosman Street (currently at project stage)
- Ryneveld Street (between Merriman and Victoria Street)
- Bosman Street (between Merriman and Banghoek Road)
- Crozier Street (important link to MBT rank)
- Joubert Street
- Marais Street
- Pedestrian crossing across Merriman Avenue (rationalisation of crossing points)
- Pedestrian crossing at Van Riebeeck/ Coetzenberg Street

Figure 35 also indicates the need to connect the Oude Libertas Campus[8] situated on the western side of the railway line with the main campus. This requires collaboration with SM. The 2020 Municipal NMT Masterplan incorporates the proposed internal SU routes so that an overall network is formed.

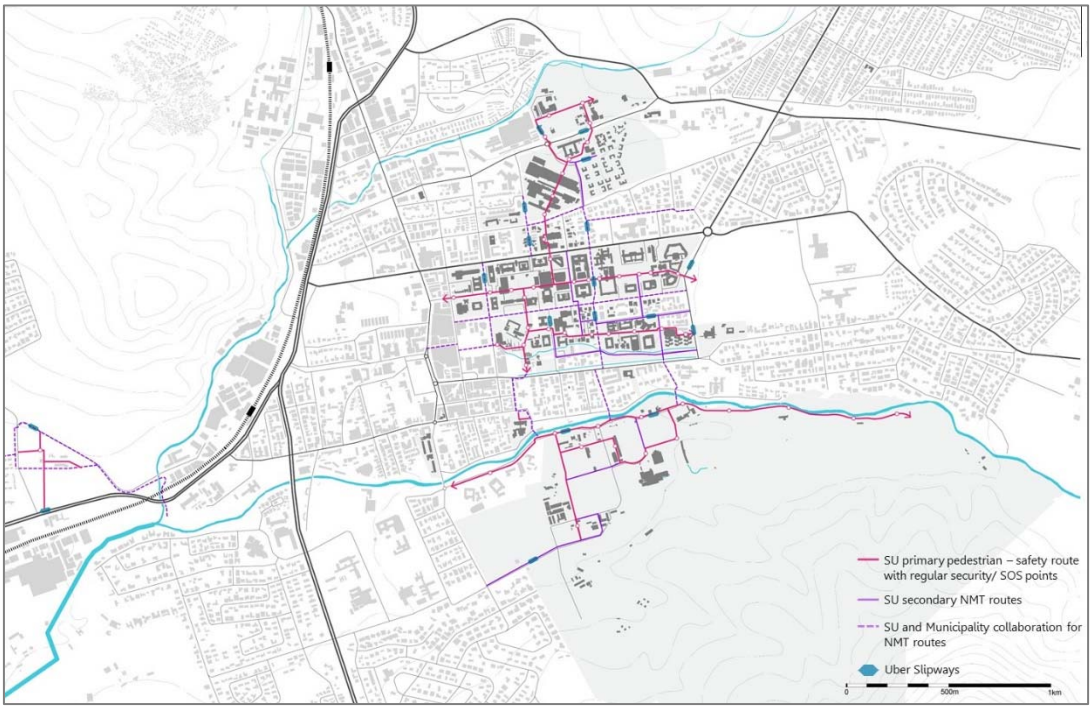


Figure 35: Stellenbosch University: Proposed NMT Routes and 'Uber' Stops (Source: SU, 2020)

[8] The new Stellenbosch University Business School will be developed on a part of the Oude Libertas site that Distell donated to Stellenbosch University.

3.7.3 SM Human Settlements Roll-Out Plan

Various largescale housing projects have been identified for future residential development in the SM. These housing sites may be mix-used developments, Upgrade of Informal Settlements, GAP market/ FLISP subsidies, BNG Housing/ subsidised housing (including backyarders), CRU/Social Housing or servicing of sites. Due to their nature of serving low income households, those development areas will require internal NMT routes and public transport accessibility. This implies that sidewalks are wide enough to accommodate the expected high volumes of pedestrians.

Currently, sidewalk infrastructure in recently developed low income settlements was observed to be too narrow as well as lacking connection to the main PT hub. Refer to Figure 36 for examples from Klapmuts and Groendal/ Langrug.

Figure 36: Groendal/ Langrug: Road infrastructure for future housing development lacks infrastructure for walking and cycling

Figure 37: Klapmuts: Provided sidewalks are too narrow

Within the municipal area, significant areas of housing development are identified in Klapmuts (1 500 du), Kylemore (200 du), La Motte (600 du) and Langrug (1 200 du). Figure 39 depicts the extent of low income housing in the wider Franschhoek area. The expected growth is substantial which will require appropriate pedestrian and cyclists route to and from those new neighbourhoods, integration with the existing network and identification of safe crossing opportunities (in this case the R45).

The main areas of growth within Stellenbosch Town are identified north of Kayamandi (approx. 6 000 du), south of Jamestown, and south of the R310 at Distell Libertas (Droë Dyke with approx. 4 000 du). Refer to Figure 38.

Figure 38: Stellenbosch Town: Future development areas incl. Housing Pipeline

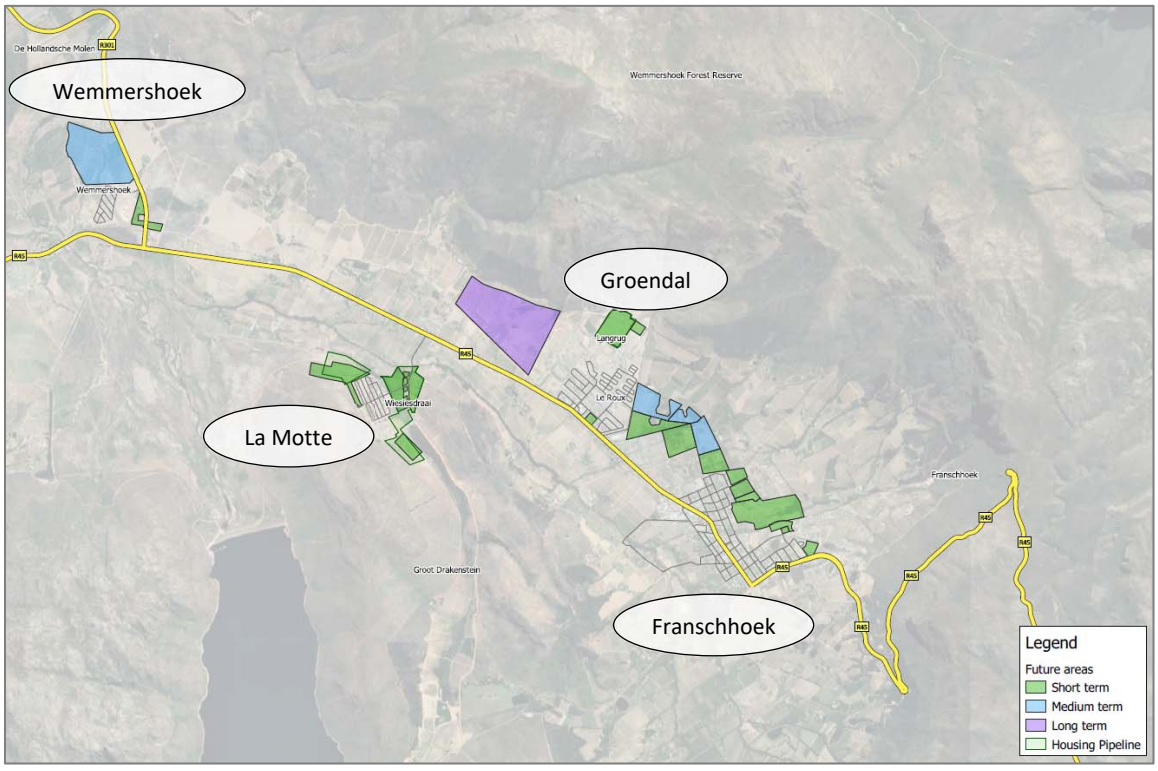


Figure 39: La Motte/ Groendal: Future development areas incl. Housing Pipeline

3.8 Summary: Challenges and Opportunities

The Status Quo Assessment identified a number of challenges which the updated 2020 NMT Network Plan addresses. In particular, of **concern** are:

- Spatial planning and barriers: Previously disadvantaged neighbourhoods are located beyond major roads relatively far away from work opportunities, which leads to long routes and unsafe crossing manoeuvres.
- Fragmented NMT facilities from outlying suburbs to CBDs: Pedestrian and cyclist facilities are incomplete and often not wide enough for the observed pedestrian volumes.
- Incomplete and limited cycling network in Stellenbosch CBD: Existing bicycle facilities are isolated routes and need improved connectivity.
- Public transport: PT interchanges lack good integration with pedestrian routes, and are especially poorly accessible for people with disabilities.
- Roughly 30% of all roads in the whole municipal area have sidewalks at least on one side of the road.
- Sidewalks and cycle facilities are too narrow and are not universally accessible: Cars are favoured in the streetscape which leaves limited space for pedestrians and cyclists. Often, sidewalks are also obstructed by parked cars and street furniture.
- Safety for pedestrians and cyclists: Of specific concern are the crossing of big intersection which primarily accommodate private vehicle movements.
- Role of provincial roads through CBD areas: Due to their mobility function, provincial roads such as Merriman Ave in Stellenbosch Town and the R45 through Franschhoek, attract regional traffic and are not very pedestrian friendly.
- Cycling along provincial roads is popular but road safety is a concern.
- Affordability of cycling and ability to cycle: Although there is high potential for cycling ito distances, there is the barrier of affordability. Theft of bicycles is also a major concern and hindrance. Also, especially women do not feel comfortable to cycle for various reasons; most probably due to being not able to cycle and because cycling is not being culturally accepted.

However, there are also a number of **opportunities,** which are listed hereafter:

- Walkable and cyclable distances: In Stellenbosch town, places of work and education can easily be reached by walking or cycling. Specifically, some streets in Stellenbosch CBD are already pedestrian friendly which can easily be extended to form a wider network (Andringa Street and Victoria Street).
- Potential of the CBD and old town tourist hub: The old town has the potential to embrace an even higher level of pedestrian routes and to emphasise pedestrian priority.

- Significant student population in Stellenbosch: The routes between the faculties, residences and sports ground are already well used by students and staff. If a coherent network of high standard is provided (with PT/uber integration), it will be possible to promote walking and cycling even more – considering that the student population represents 36% of the total population.
- (Road) Cycling is very popular and motorists are already more aware of cyclists. There is an opportunity to promote a broader range of cycling trips if safe routes are provided.
- The University's plans of pedestrianisation and efforts to make cycling a more viable mode has the potential to make a large portion of student/staff rethink their current travel arrangements.
- Strong civic advocacy groups such as the NMT Forum and Mobility Forum can support the efforts of the municipality.
- The planned redevelopment of the Adam Tas Corridor and integration of Kayamandi with Stellenbosch Central.
- Future expansion of local settlements, such as Klapmuts , are an opportunity to integrate NMT movements from the start and to provide designated space which is adequate in terms of width and directness.

It can be concluded that Stellenbosch Municipality and particularly Stellenbosch town has great potential for cycling due to the town's size, topography, student population and tourist appeal. It also offers a compact, thriving CBD where most commercial and retail needs can be satisfied, a culture of café shops and outdoor dining, which contribute to attractive public spaces for people to relax and explore. The CBD environment and surrounding residential areas are all within walkable distances with the university, residences, restaurants, shops, offices, located close to one another.

4 VISION AND STRATEGIES

4.1 Overarching Planning Framework

4.1.1 Integrated Transport Plan

Stellenbosch's vision is to be a Valley of Opportunity and Innovation with Strategic Focus areas that include being a Valley of Possibility, Green and Sustainable Valley, Safe Valley, Dignified Living with Good Governance and Compliance. In response the ITP highlighted the transport response to this and listed the following actions:

- Effective public transport and NMT systems for access to opportunities
- Public Transport, walking and cycling network and other improvements
- Road safety projects to improve safety practices
- Establish safe and secure public transport and NMT systems
- Implement public transport systems that are accessible and affordable for all

4.1.2 Recent NMT Planning Initiatives

NMT planning in the SM has come a long way and all plans conclude that Stellenbosch Municipality and particularly Stellenbosch town has great potential for cycling due to the town's size, topography, student population and tourist appeal. It also offers a compact, thriving CBD where most commercial and retail needs can be satisfied, a culture of café shops and outdoor dining, which contribute to attractive public spaces for people to relax and explore.

The University (SU) plays an important role in the uptake of the identified NMT. SU has plans in place to improve the bicycle infrastructure on campus and to align its NMT network with the objectives of the Municipality. The proposals include the pedestrianisation of some of their own private streets and providing slipways for UBER vehicles.

Stellenbosch Bicycle Plan

In 2015 a Cycle Plan for the town of Stellenbosch was developed. Very thorough analyses was undertaken resulting in a bicycle network plan for the town of Stellenbosch, as well as an approach for cycling in Stellenbosch. The latter included a vision for cycling, guiding principles, aspirational goals, a comprehensive program and an action plan. However, this plan was limited to the town of Stellenbosch and only focused on cycling, whereas the scope of this vision framework is inclusive of the entire Stellenbosch Municipality, including Franschhoek, Klapmuts and Pniel, as well as focuses on all modes of non-motorised transport.

Some key elements are extracted as it pertains to the Vision Framework for Stellenbosch Municipality.

The vision statement is "By 2030, cycling within and around Stellenbosch has become the popular form of mobility that is safe, convenient and is accepted and promoted by all." The following guiding principles are listed:

- Safety
- Accessibility and Integration
- Collaboration

The following Aspirational Goals are listed:

- Stellenbosch is recognised as the best cycling town in South Africa and one of the best cycling tourism destinations in the world;
- The cycling network allows people to move easily between home / places of residence and work, educational facilities, places of interest and other destinations or just for pleasure;
- Cycling in Stellenbosch is accepted as a safe means of transport with zero fatalities;
- Where all age groups, including children and the elderly, use cycling as a safe, convenient, relaxing and enjoyable mode of travel;
- Cycling is accepted as a key contributor to the local economy; and
- With a 15% modal share, cycling has resulted in a substantial reduction in congestion and GHG emissions within Stellenbosch.

Stellenbosch University

Stellenbosch University's Integrated Transport Plan proposes a nodal approach to manage transport on the Stellenbosch Campus with walking and cycling being the preferred mode. It also identifies that the movement desire lines overlap on municipal and university streets and property and that alignment is required. In support of the Matie Bike project it is also proposed that bicycle infrastructure on campus be improved and that collaboration is required with the municipality to improve pedestrian and cycling links to and from campus.

4.2 Vision Statement and Objectives

To arrest the gradual prioritisation of cars over people, certain strategies and policies have to be adopted to ensure that non-motorised transport users are prioritized in transport planning and street design. Stellenbosch Municipality has adopted the following vision for pedestrians and cycling:

"Stellenbosch Municipality will strive to develop walkable and cycle-able environments that are safe for all to use and contribute to the mobility needs, economic vibrancy and social health of communities."

This can be translated into the following **Strategic Objectives**:

Connect the outlying communities with the CBD in a safe and attractive manner and improve safety, access to opportunities and the dignity of these communities.

This requires safe connections for pedestrians and cyclists into the CBD and specifically the Kayamandi crossing of the railway line towards the CBD and across the R304 to the schools in Cloetesville and the Helshoogte/ Cluver Street crossing must be addressed. Similar in other towns such as Pniel, Klapmuts, and Franschhoek, safe and convenient routes for pedestrians and cyclists have to be provided that connect to the town center.

Strive towards car-free living in Stellenbosch CBD.

A traffic management approach that favours more vulnerable road users, the introduction of measures to reduce traffic flow in the CBD and develop more pedestrian-friendly or pedestrianized streets in the CBD, should be pursued. This approach can only really be successful if it is underpinned by a CBD public transport distribution service.

Achieve a modal shift in the Stellenbosch CBD towards public transport, walkability and cycle-ability.

The Stellenbosch Cycle Plan estimate that the current cycling modal share in Stellenbosch town is 2-2.5%. Achieving a modal shift towards public transport, walking and cycling will require that streets must be transformed into vibrant pedestrian-friendly spaces with supporting land use, sidewalks that are universally accessibility, traffic management in favour of pedestrians, cycling and public transport. Parking in the CBD reduced over time by introducing differentiated parking tariffs with more affordable parking on the outskirts of the CBD.

The Cycle Plan for Stellenbosch has set the scene for promoting cycling in the CBD towards its aspirational goal of being "*recognised as the best cycling town in South Africa and one of the best cycling tourism destinations in the world*", and a series of action plans have been identified.

Creating dignified living spaces in previously disadvantaged areas.

Pedestrian footways/ paths and cycle networks are required to connect people to civic amenities, schools, public transport facilities and markets. These should be quality environments, bringing dignity to the public space.

The following famous quote is usually attributed to Einstein - "*Insanity is doing the same thing over and over and expecting different results.*" Achieving this vision of walkable and cycle-able environments will require a move away from "*business as usual*" approach in transport planning and engineering. In support of this, clear principles, policies and strategies must be followed to guide officials and politicians of Stellenbosch Municipality in the implementation of transport infrastructure projects in the future, else nothing will change.

4.3 Key Principles

These key principles must serve as the foundation for the implementation of transport infrastructure to allow more pedestrian friendly and cycling environments to follow.

- **Integration between land use and transport** towards developing pedestrian friendly environments to reduce the demand for travel and the need for motorised transport. This is essential in reducing people's dependency on motorised transport.
- **Prioritizing vulnerable road users at conflict points** will improve road safety for pedestrians and cyclists and encourage people to walk and cycle more.
- **Outlying communities** are captive users of public transport and walking. These communities **must be prioritized and the environments for pedestrians and cyclists be improved** to encourage and support these modes.
- The development of sustainable transport solutions and pedestrian/ cycle friendly environments cannot sole be undertaken by the public sector. A **partnership** with the private and public sector towards furthering car-free living is required, including Stellenbosch University.
- **Roads and Streets for all**. This requires the re-prioritisation of road space to ensure that all the needs of all users of the street are adequately provided for. Where the needs of the various users are in conflict, the needs of the more vulnerable road user must receive priority.

4.4 Focus Areas

The creation of more livable environments are not sole the responsibility of infrastructure implementers. The transport environment is planned, designed and managed by various departments. Officials are all responsible for different focus areas within the transport environment. All these implementing agencies are responsible for creating liveable environments. Particular focus areas, along with their leaders, stakeholders and role-players, include the following:

- Planning
- Human Settlements
- Legal Framework
- Infrastructure
- Traffic
- Operations
- Awareness
- Partnerships

Accordingly, strategies are developed for each of these focus areas and these are discussed in more detail hereafter.

4.5 Target Market

The NMT Strategy targets all non-motorised transport users in Stellenbosch Municipality and includes **learners, recreational cyclists, commuters, students, people with special needs and pedestrians**.

In the Stellenbosch Cycling Plan **Low Income Residents** and the **Stellenbosch University** have also been identified as particular target areas with specific targeted strategies.

- Access to bicycles for lower income residents of all ages is a critical target market and priority for the cycling programme going forward. A high number of people can be seen walking from Kayamandi, Cloetesville and Idas Valley and this is either by choice or being forced to walk due to economic constraints.
- The Bicycle Plan also mentions that the student population is an important target market for cycling and can provide the required tipping point to increase cycling the CBD.

4.6 Strategies

A set of strategies have been developed for each focus area and along with that, a key principle for the particular focus area have been developed, as well as the lead implementing department/ stakeholder/ unit.

4.6.1 Planning

Principle: Integration and Liaison

Lead Implementer: Development Planning with a particular focus on private sector development, Province and the Planning & Economic Department

Encourage and foster an environment of institutional integration

Working together, pursuing similar goals across the various government institutions will increase the potential for successfully implementation of more pedestrian friendly and cycling environments. Officials, managers and politicians alike must encourage the integration between municipal departments, with significant role-players such as the Western Cape Department of Transport and Public Works as well the Stellenbosch University.

Encourage spatial integration of municipal projects

Along with institutional integration, spatial integration of infrastructure, communities, funding, etc will ensure that roads, pedestrian and cycle networks, urban improvements projects, human settlement projects, etc are ably integrated to allow for quality urban environments suited for people.

The Directorate Planning and Economic Development and the Directorate Infrastructure Services are specifically tasked to ensure that they work together to achieve the common vision.

- Through development frameworks for new housing projects, the public space environments should cater for all users, pedestrians, sidewalks, public transport, etc.
- Funding opportunities in the various departments must be identified and project implementation aligned.

Encourage the shared implementation of the NMT Network by the public sector and private sector alike.

- Development Planning must also ensure that private sector developments include pedestrian and cycle routes and provision for public transport, along with road upgrades. The mechanisms available is through the review and approval of the Site Development Plan (SDP) as well as through the development of the Site Transport Assessment and/ or Transport Impact Assessment, where required.
- Development Charges should be used for the implementation of portions of the NMT network.

4.6.2 Human Settlements

Key Principles:

- Integration between land use and transport
- Outlying communities must be prioritized and the environments for pedestrians and cyclists be improved.
- Partnership with stakeholders and role-players
- Roads and Streets for all

Lead Implementer: Human Settlement officials in Planning & Economic Department, Roads and Transport Units in Engineering Services

Discussions with the municipal officials responsible for human settlements planning and implementation highlighted the fact that pedestrians and public transport users are typically captive users of transport services and have no other options other than walking, cycling and using public transport, but yet due to funding constraints the necessary facilities are not provided. The unintended consequence is road safety concerns when pedestrians cross major roads, walk in roads, insufficient sidewalk widths or none at all and inadequate public transport services and infrastructure. Apart from funding constraints, the needs of pedestrians, cyclists and public transport users are not adequately identified and assessed during the Site Development Plan (SDP) process.

From this a series of strategies have been identified to ensure an appropriate level of NMT consideration during the project inception, SDP development and infrastructure design process, increase and improve the involvement of the Engineering Unit and to create/ generate funding opportunities for NMT and public transport infrastructure.

Identify and consider non-motorised transport impacts and remedial measures in the process of formulating a Site Development Plan and ensure that NMT and public transport remedial measures are appropriately included in the conditions of approval for human settlement developments.

This intervention must be undertaken at various stages of the implementation process.

- For human settlement projects undertake a high-level NMT impact screening at the Project Identification/ Inception stage with the focus on the following:
    - Alignment with the NMT Masterplan
    - Potential external pedestrian desire lines across major roads to schools, clinics, shops, in adjacent communities
    - Consider the implications of topography on pedestrian and cycling movement
    - Public transport services required (taxi rank, embayments, etc)
    - Road classes and road reserve widths required for various classes of roads and streets
- During the SDP development process undertake a Site Transport Assessment:
    - Identify land uses and the potential pedestrian desire lines to and from schools, clinics, places of work, shops, public transport facilities, etc
    - Locate land uses that are major pedestrian trip generators or attractors in such a manner that potential road crossings are safe. For example, do not locate a school gate on a class 2 road but rather a class 4 or 5 street. At the school entrance the road reserve should be wide enough to accommodate wide sidewalks (2m or wider), public transport embayments and stop and drop areas for parents to drop learners off). A pedestrian crossing must be provided along with traffic calming proposals.
    - Develop a local pedestrian and cycling network plan and align and connect with the NMT Masterplan, as well as existing facilities and services.
    - Identify routes to the nearest public transport service
    - Where relevant (for example mass housing projects), develop a local public transport network , identify locations for public transport ranks, embayment and stops.
    - Identify the existing pedestrian and cycling facilities and public transport infrastructure as well as the remedial measures required (sidewalks, cycle paths/ lanes, pedestrian crossings, road reserve widths, traffic calming measures) and ensure that the SDP adequately mitigates these potential impacts.
- In TIAs[9] for human settlement projects the emphasis should not be so much on the impact of private vehicles, but rather the impact of public transport, pedestrian desire lines and the infrastructural requirements and approval conditions for these.

[9] The COTO TMH16 Volume 2 South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual has clear guidelines how the impacts on pedestrians and cyclists (Chapter 13) and public transport users (Chapter 14) should be assessed as part of TIAs. It further distinguishes the requirements for TIAs and Site Traffic Assessments. However, although these guidelines exists, it is not applied rigorously by all transport engineers when undertaking TIAs. It is therefore recommended that the Planning & Economic Department highlights the need for TIAs and Site Transport Assessments to adequately address the impacts and remedial measures of pedestrians, cyclists and public transport users through including a Site Transport Assessment.

- TIAs should include the following:
    - Person trip generation of pedestrians and public transport users OR Where vehicle trip reduction factors are applied[10], determine the corresponding public transport users and pedestrians[11].
    - Where relevant discuss possible modal splits for with local transport officials, identify the existing pedestrian and cycling infrastructure and the public transport services and infrastructure.
    - Where a high number of public transport trips are generated, officials should assess whether a new taxi rank is required, and propose any additional operating license requirements or adjustments to existing operating licences.
    - Develop a pedestrian and cycle network and public transport network overlay to the SDP, along with traffic calming proposals, public transport and NMT infrastructure proposals.
- Include the pedestrian, cycling and public transport infrastructure proposals as conditions of approval, appropriately tied to funding sources.
- During the design process the pedestrian and cycling infrastructure should be in accordance with appropriate infrastructure guidelines.

Improve the participation of the municipal transport unit during the evaluation of the Site Development Plan, the TIA and the road designs.

The engineers and planners in the Engineering unit must have improved and structured participation during the various stages of the project to ensure appropriate pedestrian, cycling and public transport provision as listed in Table 2.

Table 2: Participation by Transport/ Roads Engineering Officials

PROJECT STAGE	PARTICIPATION BY TRANSPORT/ ROADS ENGINEERING OFFICIALS
Project Inception	Engineering officials must provide comment on the following: • Alignment with the NMT Masterplan • Identify any adjacent high-order roads and the potential for road safety concerns • Identify potential pedestrian desire lines across higher order roads to schools, clinics, etc in adjacent communities. • Need for a taxi rank
SDP Evaluation	• Review and comment on high-level NMT impact screening • Review and comment on the SDP. Check road reserve widths, public transport space/ rank/ embayment, alignment with NMT masterplan • Identify and road safety implications

[10] The COTO TMH16 Volume 2 South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual allows the reduction of trip generation rates for areas of low vehicle ownership, very low vehicle ownership, located along transport nodes or corridors and as part of mixed use developments.

[11] Very little information or guidelines are available for pedestrian and public transport trip generation. The only local available resource known to the author is the City of Cape Town, Guidelines for the public transport component of transport impact assessments, (A working document), Draft, December 2001

PROJECT STAGE	PARTICIPATION BY TRANSPORT/ ROADS ENGINEERING OFFICIALS
TIA Evaluation	• Review and comment on the TIA. • Ensure that the TIA appropriately assesses pedestrian, cycling and public transport impacts and identifies remedial measures. • Check the pedestrian and cycling networks plan, public transport network plan and infrastructural remedial measures • Draft conditions of approval
Infrastructure Design Evaluation	• Check that appropriate standards are used and that the requirements of the SDP and conditions of approval are met.

Create or generate funding opportunities for NMT and public transport infrastructure

- Funding from Development Charges (DCs) for BNG or GAP housing should be applied or NMT or PT infrastructure aligned with the NMT Masterplan.
- Liaise and coordinate with the Western Cape Dept of Transport and Public Works for grant funding for NMT infrastructure and pedestrian safety improvements on provincial roads and roads of joint significance.
- Implement NMT infrastructure as part of human settlements implementation as required through the National Housing Grant.
- NMT funding from the Municipalities other grant funding sources (Neighbourhood Infrastructure Grant, Municipality Infrastructure Grant, etc)
- Identify public transport infrastructure funding sources available and implement along with NMT infrastructure and networks
- Identify pedestrian safety funding sources to be used for public transport, pedestrian crossings, sidewalks and cycling facilities.

4.6.3 Infrastructure

Key Principle: ***Roads/ Streets for All***

Lead Implementer: ***Roads Unit in Engineering Services***

Connect outlying communities/ neighbourhoods with safe and continuous bike and pedestrian routes

As previously mentioned the routes from outlying communities towards the CBD is a particular focus area. These routes require special attention to be safe, attractive and in line with desire lines towards key destinations and connected with an overall network of pedestrian and cycling routes. Connections include the following:

- From Kayamandi across the R304 to the schools in Cloetesville
- From Kayamandi across the railway line at Du Toit Station and along Bird Street to the CBD
- From Idas Valley across Helshoogte towards Cluver into the CBD
- From Jamestown along the R44
- From Vlottenberg along and across the R310
- From Cloetesville along and across the R44

Apart from connecting these communities to the CBD, communities should also be able to cross the high-order provincial road in a safe manner. A series of pedestrian bridges are also proposed:

- From Kayamandi across the R304 to the schools in Cloetesville. The preliminary designs for this project has already been completed.
- From Kayamandi across the railway line at Du Toit Station. A gated pedestrian level crossing is proposed as an interim measure. However, there are concerns that PRASA might not support the proposal as they do not support the formalisation of level crossings.
- From Idas Valley across Helshoogte towards Cluver into the CBD
- From Cloetesville along and across the R44

Create pedestrian/ cycle -friendly streets/ pedestrianize in the CBD environments

The CBD is a particular focus point with the Stellenbosch University Campuses, the tourist hubs around Dorp Street and Church Street and public transport concentration points in Stellenbosch (Du Toit and Stellenbosch Stations with Bergzicht Taxi Rank). Similarly, Franschhoek CBD is a particular focal point with a strong pedestrianized culture. In Klapmuts, Pniel pedestrian activity is mostly focused around the main road through the town. Pedestrian friendly streets will improve the safety and attractiveness of non-motorised transport, attract more people to walk and cycling, encouraging the modal shift towards public transport, cycling and walking. Some key actions to be considered are:

- Pedestrian/ cycle safety to be prioritized at intersections in CBD and at conflict points (pedestrians, cyclists vs vehicles).
- Trade on-street parking for cycle lanes in a progressive manner and find a balance between parking provision and cycling.
- Provide pedestrian crossings.
- Introduce traffic calming for example Victoria Street and Andringa Street.
- Progressively roll-out a cycle network in Stellenbosch CBD (see below).

Create a network of pedestrian and cycle facilities, along with bicycle parking

Various studies have confirmed that cycling can only really be encouraged if a continuous network of cycling facilities exists. The directness, continuity, safety along the route will encourage cyclists and improve their prominence in the streetscape.

- Identify and implement a core cycling network in Stellenbosch CBD, connected to key institutions and the University Campuses.
- Identify continuous and direct route from outlying communities outside of Stellenbosch and create cycling space along the higher-order provincial roads and connect these routes to the CBD cycle network. Alternatively, provide separated cycle and pedestrian paths.
- In the communities of Pniel, Klapmuts and Franschhoek where strong desire lines typically are located along the higher order provincial road, provide separated pedestrian footpaths and cycle paths along these routes to connect to the urban nodes within these settlements, as well as to schools.
- Locate bicycle parking at appropriate locations depending on the need, demand, security and attractiveness. Private sector developments should also be encouraged to install bicycle parking. Locations to consider include:
    - Places of work, especially where employers are participating in a scheme to promote cycling with their employees. Employers should be encouraged to provide secure parking on site.
    - Schools, universities and colleges
    - Stadium entrances, gymnasiums and sports fields

- Shopping centres
- Civic facilities – community halls, clinics, hospitals, libraries, etc.
- Public transport facilities such as interchanges, rail stations, etc.

The public sector and the private sector alike should be encouraged to install bicycle parking facilities.

As safety is a key consideration, safe cycling facilities should be provided at key locations. The Stellenbosch University has various nodes across campus (Admin Building, Residences, etc) and will also implement bicycle parking along with its other infrastructure in support of multi-modal transport options.

The municipality should encourage the implementation of bicycle parking facilities at civic nodes (libraries, community centres, etc). Bicycle parking should also be provided as part of private developments.

Develop universally accessible streets

A recent audit completed by Jeremy Hazell indicated that the streets in the CBD are not universally accessible and hampers the mobility of people in wheelchairs. The Municipality should encourage that all new infrastructure being implemented through private sector and public sector role-players be universal accessible.

Create space for cyclists and pedestrians along provincial roads in the CBD

The provincial roads running through the CBD is a particular area of concern. Sections running through the CBD include *Adam Tas, Helshoogte,* the *R304,* the *R44* and *Merriman Avenue*. These roads should be managed to become more pedestrian-friendly over time by considering the following:

- Use the shoulder for cycling and separate it from vehicle traffic.
- Use bulb-outs to decrease the crossing distances at major intersections
- Provide sidewalks and footpaths where required, along with pedestrian bridges and pedestrian crossings.
- Set traffic signal phasing in favour of pedestrians where significant amounts of pedestrians are crossing.

Investigate ways and means with the Province to enable cycling along the provincial roads in the municipality

The provincial roads within the Stellenbosch Municipal area are well-known for recreational cycling, especially *Baden Powell Drive, Stellenbosch Arterial, Helshoogte, the R304 and the R45*. These roads typically have shoulders but have high operating speeds, 80km/ hr and higher. However, cyclists do use these roads and cycle along the shoulder. Cyclists Warning Signs have been installed along some of the roads, but cycling along the provincial roads should be further explored in discussions with the Province.

Possible options include the following:

- Cyclist Warning Signs along the routes
- Warning signs, along with cyclist guidance signs and road markings, along the shoulder
- Provision of a high-quality cycle path located in the road reserve but separated from the roadway

Use various municipal budgets to implement portions of the network

The implementation of facilities for cyclists and pedestrians should not be the sole responsibility of the Roads and Transport division at Stellenbosch Municipality. Promoting cycling and pedestrian movements must become a Municipal priority. Various funding sources (capital, operational and grant funding) should be utilised, and where appropriate and sourced from various other departments, such as Planning & Economic and Community Services etc.

Implementation by private sector developers and the Stellenbosch University

Similarly, private sector developers should also contribute/ implement sidewalks, cycle paths/ lanes and public transport embayments as part of the role-out of remedial infrastructure measures through the use of Development Charges.

Implement cycle routes in CBDs (cycle lanes and paths (sidewalk or off-street))

A continuous cycle network should be developed in the CBD that enables people to cycle from point A to B in the most direct manner, along a continuous network of lanes, paths and routes. In the same way that pedestrians can navigate across the CBD. Various tools are available to achieve this and some actions include the following:

- Trade parking for cycle lanes.
- Share sidewalks with pedestrians but do not attempt to squeeze all users on a sidewalk if there is insufficient space. Note that a cyclists need 1.4m effective clear space. If this space is not available due to conflicting pedestrians and street furniture, cyclists will start to use the road again.
- Bicycle priority/ accommodation at intersections.
- Share wide pedestrian routes and public space.
- Dropped kerbs at all level changes.

Decluttering of sidewalks

Sidewalks are typically obstructed by the clutter of urban street furniture such street lighting poles, road signs, traffic light poles, advertisement and distribution boxes. These are typically located in such a manner that it obstructs the flow of pedestrians and the cluttering of sidewalks reduces the effective widths for pedestrians, cyclists and those people using wheelchairs.

An audit of existing road signage can be undertaken to determine to what extent it can be rationalised. In this manner the effective width of sidewalks can be increased in a relatively cost-effective manner.

Safe routes to schools

Schools have been identified as a particular focus area as well.

Routes in close proximity, approximately 250m around schools, should be identified. However, more vulnerable schools (rural schools and schools located in poor communities) should be prioritized. Examples of some infrastructure interventions at the accesses to schools include the following, but more detailed on-site investigations are required to determine the most appropriate infrastructure measures / improvements.

- As far as possible school accesses should be located on lower order class 4 or 5 roads.
- The speed limit sign of 40km/ hr must be introduced around schools.
- Proposed infrastructure interventions include the following:

- Sidewalks on both sides of the road for at least 100m on either side of the entrance(s) to the school or to the closest side streets if spaced closer than 100m. Alternatively, implement low cost interventions such as widening the walking space by demarcating some road space for pedestrians as well or using the drop-off area for vehicles for pedestrian space as well at schools where vehicular drop-off and collection is limited or completely absent.
- Yield Raised pedestrian crossings in combination or without scholar patrol or signalised pedestrian crossing if warranted. An alternative layout is to have speed humps spaced 100m apart on either side of the pedestrian crossing. In this instance, the pedestrian crossing is not raised. Alternatively, flat tables could be used either side of a yield raised pedestrian crossing to make motorists more aware of the pedestrian crossing ahead.
- Appropriate road signs and markings, including a speed limit zone of 40km/h surrounding the school, once approved and adopted.
- Drop-off locations in front of the school in both directions at locations where it is required. It is important to consider the modal split at schools as some learners will primarily walk; others might use public transport or personal transport. Depending on the dominant mode, a drop-off facility should be provided. Site-specific assessments are needed at the various schools, incorporating traffic circulation, parking needs and movement of scholars. If the road reserve width is not wide enough to accommodate drop-off facilities, inclusive of NMT facilities, the school should be consulted to avail land.
- Dropped kerbs at appropriate crossing locations

4.6.4 Legal Framework

Key Principle: Roads and Streets for all

Lead Implementer: Head of Engineering Services

Align the municipal by-laws for streets with the IDP's strategic focus areas.

A clear set of policies and by-laws are required to support the principles, strategies and projects proposed. An approved policy will provide the municipal officials with the mandate to implement more sustainable transport solutions, design and implement in favour of more vulnerable road users.

Further update the municipal by-laws for streets to be in support of promoting sustainable transport solutions and acknowledging the priority of the more vulnerable road users and regulating an approach of Roads/ Streets for all.

4.6.5 Traffic Operations

Key Principle: Prioritizing vulnerable road users at conflict points, Roads/ Streets for all

Leader Implementer: Traffic Engineering Unit

Reduce traffic in CBD towards creating more liveable environments

It is the reality that in CBD environments, space is limited. This implies that any one user prioritized over another, comes at the expense of another. The approach to creating more liveable environments implies that it will come at the expense of the priority that motorised transport currently enjoys. In more simplistic terms; road space must be shared with non-motorised transport users and traffic be

reduced in the CBD. It is only through reducing traffic in the CBD that non-motorised transport can feel safe, enjoy priority and environments become more attractive.

Actions that should be pursued are as follows:

- As the Stellenbosch University is a significant land holder in the CBD, as well as one the major traffic attractors in the CBD, the Stellenbosch University should introduce travel demand measures and a university transport shuttle to reduce traffic in CBD.
- Other corporates located in the CBD should also introduce travel demand measures (shared ride schemes, preference for high occupancy vehicles, limiting parking provision in CBD sites, etc).
- The proposed Western Link between the R310 (Adam Tas) and Technopark, connecting the R310 with Technopark, will reduce through traffic the R44 through Stellenbosch. The possible extension of the link road, from Adam Tas, past Devon Valley and along the back of Kayamandi will further alleviate congestion in the CDB as well as along the Adam Tas Corridor.
- The location of parking garages and sites also play a significant role in directing incoming and exiting traffic away from CBD environments with high pedestrian and cycling activity. The municipality should purse the implementation of parking garages on the periphery of the CBD or encourage the private sector to develop parking garages at strategically located sites.
- Adam Tas Road, running north-south pass the Stellenbosch CBD, can function as a multi-modal corridor allowing traffic (freight, buses and taxis, private vehicles) to pass the CBD without entering the CBD; freeing up some of the north-south streets in the CBD.

Introduce pedestrian-friendly phasing at signalised intersections.

Traffic signal phasing is generally developed to maximize the throughput of vehicles with a minimum green time allowed for the pedestrian crossing phase. Stellenbosch Municipality should employ exclusive pedestrian phases at key intersections with significant pedestrian volumes.

Prioritize pedestrian movements around nodal points (schools, public transport facilities,etc)

The urban environment around public nodal points such as schools, public transport facilities, hospitals, clinics should also become pedestrian friendly through the implementation of the following:

- Wide pedestrian and cycle facilities around the nodal points because of the significant concentration of people
- Traffic calming to slow down traffic or by-pass traffic
- Universal accessible facilities

4.6.6 Transport Systems and Operations

Key Principle: **Integration between land use and transport**

Lead Implementer: Portfolio Committee Member for Engineering Services along with the Head of Engineering Services

Develop CBD public transport service in Stellenbosch CBD integrated with pedestrian and cycle networks and parking opportunities

Achieving the desired modal shift away from private vehicle usage and over time, with a move towards car-free living, will require significant interventions towards sustainable transport operations by Stellenbosch Municipality. This includes the implementation of an inner-town/CBD public transport distribution service, promoting walking and cycling as transport modes as preferred mobility options

in Stellenbosch CBD, and to manage the provision of parking in the CBD as excessive parking provision can further encourage private car usage.

Possible options include:

- Public transport distribution service in the Stellenbosch CBD, along with a Stellenbosch University Shuttle service and a Park & Ride
- Bicycle parking implemented by the public and private sector
- Support for bicycle –rental schemes
- Municipal institutional support for pedi-cabs and e-scooters

4.6.7 Partnerships

Key Principle: Partnership

Lead Implementer: Portfolio Committee Member for Engineering Services along with the Head of Engineering Services

Successful implementation of initiatives in support of car-free living will require partnerships with key stakeholders and role-players.

Form partnerships/ alliances with key role-players and stakeholders to co-implement the strategy

The following key role-players/ stakeholders have been identified:

- The Transport Forum
- The NMT Working Group
- Other municipal departments, especially Planning and Economic Development
- Private Sector
- Stellenbosch University
- Western Cape Dept of Transport and Public Works, Roads Branch
- Stakeholders identified through the Municipality's IDP processes

Approach donor/ corporate funders for funding

Various organisations have a mandate to support projects that identify and nurture sustainable transport solutions. The Non-Motorised Transport plan can be used as a sound platform to approach potential donors to fund the design of projects or the implementation of capital projects. Possible organisations include:

- Stellenbosch University
- Various corporate organisations based in Stellenbosch CBD
- Various international and national donor funding organisations that promotes the implementation of sustainable transport/ green transport solutions

Stellenbosch Municipality should also approach the larger corporations based in Stellenbosch CBD to finance projects in support of sustainable transport solutions such as the implementation of the NMT network. This could be in the form of implementation as part of developments, implementation on behalf of the Municipality or creating a fund for implementation.

5 NETWORK DEVELOPMENT

5.1 Approach

The approach to the development of the NMT Network Plan included the following:

- Firstly, we developed a sound understanding of pedestrian desire lines based on land use planning (existing and proposed), barriers to pedestrian movement, safety hazard locations, major pedestrian generators and attractors as well as the role of public transport and learner movement.
- Review of the existing NMT and Cycle Network: We overlaid both networks, identified missing links, correct possible misalignment of routes, provide direct routes to connect to recently built developments and propose connections to future development initiatives.
- NMT Routes were proposed at two levels: (1) Ensure that a higher-order network around the town is provided that offers a certain level of cycling and pedestrian mobility, as well as (2) creating a local cycling and pedestrian networks in neighbourhoods that connect key land uses such as schools, public transport stops/ ranks, CBD area etc.
- A high-level identification of existing facilities was undertaken. This served as an informant to identify upgrades of existing facilities and to determine cross-section details per road segments. The latter was important to identify available widths for future bike lanes, shared footpaths, off-road facilities, and areas for pedestrian prioritisation.
- The proposed network was workshopped with the client.

As a subsequent step, short-term projects were identified based on:

- Review of priority projects identified in the previous NMT & Cycle Plan (2015) and update thereof as required.
- Incorporate projects identified by the Provincial Sustainable Transport Programme (2018).
- Ensure pedestrian safety hotspots are addressed (as identified through discussions with officials and in reviewing the Transport Safety Master Plan, 2016).
- Identify locations where pedestrian bridges and safe crossings at railway line and major roads are required.
- Identify the areas with high NMT activity and identify the need to make those areas more NMT friendly and safer.
- Addressing existing NMT desire lines through the upgrade and/or new infrastructure.
- Upgrade current informal links to be weather-resistant and accessible throughout the year.
- Addressing future NMT desire lines (in line with confirmed short-term development initiatives and identified growth nodes in the municipal area as per the SDF).

5.2 Principles

One overall principle of the NMT Network Plan is to achieve a safe environment for pedestrians and cyclists. Proposed measures are described in more detail hereafter.

5.2.1 Pedestrian Priority

It is essential that more space is allocated for pedestrians and that their safety is improved. The NMT Masterplan proposed three levels of pedestrian intervention, namely:

- Pedestrianisation in a CBD environment
- Traffic calming and Woonerf Zones
- Safe Routes to School

Pedestrianisation in the CBD requires the transformation of streets in areas or routes with high pedestrian volumes so that pedestrians have priority or have an increased share of available road space. This entails, that the street design is favoured towards the needs of pedestrians by significantly extending sidewalk space and restrict travel volumes and reduce travel speeds. Basically, transform streets into spaces that are human centred and an extension of public space. This also includes providing more space to outside dining, which is has become very popular with locals and tourists.

In the past, SM had several initiatives to pedestrianise Church Street and a portion of Andringa Street (between Church and Plein Streets). To date, unfortunately, this was only implemented as part of temporary events and needs be further pursued. The portion of Andringa Street between Plein and Victoria Streets have also been transformed through traffic calming and restaurants resulting in an environment where pedestrians have priority.

The intent is to overtime transform more streets in the CBD like this, in parallel with adequate parking solution and traffic accommodation – one step closer towards SM's vision of car-free living. Refer to the images below which display Andringa Street with and without pedestrian priority intervention.

Figure 40: Stellenbosch CBD, Andringa St: Unfriendly pedestrian environment (August 2020)

Figure 41: Stellenbosch CBD, Andringa St: Café spilling over into sidewalk and road space during Transport week in October 2017

Pedestrian priority within neighbourhoods is proposed to be done in the form of **traffic calming and creation of Woonerf Zones.** Woonerf zones are identified as an essential element in the urban restructuring process of making the inner town more pedestrian friendly. According to the South African Roads Traffic Signs Manual (SARTSM), pedestrians have right of way in Woonerfs, and only local vehicular access is allowed with speeds below 30km/h. Pedestrian and Cycle routes that are proposed in residential streets should preferably be implemented by the means of physical interventions such as narrowing roadway width, off-set parking, and landscaping, to create a shared space environment. Examples of possible street transformation in local neighbourhoods can be found in the Dennesig Neighbourhood Urban Design Guideline Report (August 2019)[12]. There are a range of measures illustrated, which need to be tailored to the local situation and to potential budget constraints. Refer to Figure 42 for a woonerf proposal for Hofman Street.

Figure 42: Woonerf proposal for Hofman St as part of the Dennesig Densification Precinct

Safe NMT infrastructure around schools is one key element in creating liveable neighbourhoods. This can be done in many ways but ideally includes the extent of walkable space in front of schools and along the main routes to school, safe pedestrian crossings as well as reduction of travel speeds. Favourably would also be to investigate if one-way traffic zones can be implemented or that a short section of a street is closed completely for cars.

[12] The Guideline provides the following definition: "A woonerf a street typology that subverts the movement of vehicles in favour of pedestrian movement and is often called a "living street". The space is characterised by shared space between pedestrians and vehicles, slow vehicle speeds and traffic calming measures. The space is often well-landscaped which integrates planting into road calming measures."

Figure 43: Krigeville: Example of a existing raised pedestrian crossing in front of a school

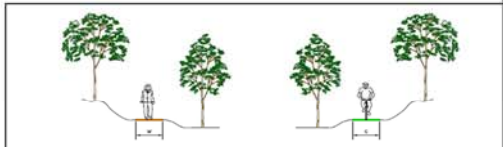
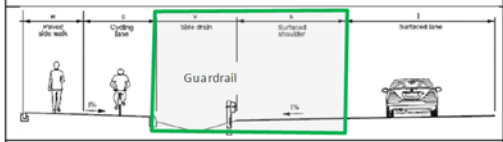
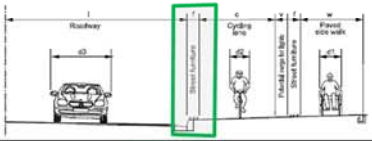
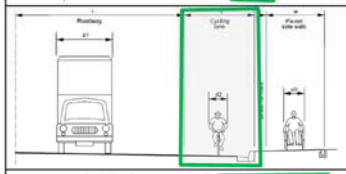
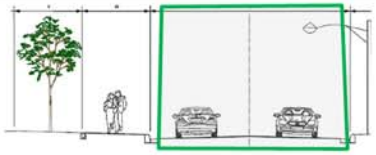
Figure 44: Cloetesville: Extension of sidewalk space and possibly reduction of drop-off area at schools if not needed

5.2.2 Safe and Convenient Cycling

The Status Quo assessment revealed that sections of cycling infrastructure have been provided but in a fragmented manner. Discussions with the NMT Forum also identified that "paint is no protection" (referring to bicycle lanes without physical separation to motorists).

The NMT Facility Guideline (2015) emphasises that the degree of separation between the NMT facility and vehicles is one of the most important elements of safety of NMT facilities. Six Degrees of Separation are recommended which are illustrated in Table 3.

Table 3: NMT Facilities and respective Degree of Separation

	Degree of Separation		Design Criteria (Width)			Cycle Facility Classification
	NMT Separation	NMT Facility Description	NMT Facility [1]	Recommended minimum	Optimal	
	**NMT Only**	The NMT facility is separate and removed from vehicular traffic over most of its extent. Reserved for either cyclist only, pedestrians only or shared by pedestrians and cyclists.	Pedestrian walkway	1,5m	2,5m	NA
			Bicycle lane (two way)	1,8m	2,5m	Class 1
	**Total**	A heavy barrier or sufficient space separation between motorised traffic and NMT facility.	Pedestrian walkway	1,5m	2,0m	Class 2
	**Partial**	Separation by means of level difference between the travelled ways such as a kerb and sidewalk or by means of light barriers.	Shared ped & cycle facility	3m	3,5m	Class 2
			Pedestrian walkway	1,5m	3,0m	NA
	**Marked Separation**	Motorised and NMT traffic run on the same surface but are separated by means of continuous road marking and signage to identify the lane as a bicycle lane or pedestrian walkway.	Bicycle lane (one way)	1,8m	1,8m	Class 3
	**Priority**	A section of road where NMT has priority and slow speeds are mandatory - no continuous road markings only signage.	Priority Streets	Shared space. No continuous road markings, only signage. Slow speeds are mandatory.		Class 4
	**Mixed (None)**	Cyclists compete with motorised vehicles for space on the road. Pedestrians must still use the sidewalk or gravel shoulder.	Mixed shoulder	No continuous road markings, only signage.		Class 4

Note:

1) List of facility types/ combinations thereof is not intended to be exhaustive.

2) Own table based on recommendations of the SA NMT Facility Guideline (2015).

The NMT Network Plan for Stellenbosch acknowledges the Degree of Separation to distinguish between the types of proposed NMT infrastructure but also differentiates between four classes of bicycle facilities. The latter is a recommendation of the previous NMT Guidelines (2003)[13]. The four bicycle classes are briefly described below:

- Class 1: Located along an independent separate alignment outside of the road reserve and reserved for either cyclist only or shared by pedestrians and cyclists. This is commonly referred to as a cycle path.
- Class 2: Path which is located within the road reserve, located adjacent to the road way on the same alignment, but separated from the road way by level difference and / or kerb and reserved for either cyclists only or shared by pedestrians and cyclists. This is commonly referred to as a cycle path.

  Note that in the Stellenbosch NMT Network Plan, a Class 2 facility is a proposed NMT facility of partial/ total separation that runs parallel to a walkway. Facilities can either be segregated or integrated (shared between pedestrians and cyclicts).
- Class 3: Bicycle path that forms part of the street or the carriageway and is marked accordingly. This is commonly referred to known as a cycle lane.
- Class 4: Located on a low-volume street to serve as a feeder link in a cycle network of cycle paths and lanes. The route is indicated by signs and markings. This is commonly referred to as a cycle route.

NMT facilities are required to be provided within the right of way of all roads where NMT users are significant. While designs should strive to achieve total separation, particularly along high classes of road, this is not always possible.

While it is important to ensure that cycle intervention is appropriate for the street type, it is also important to provide continuity for cyclists along a route. A strategic overview of a route is required to ensure cycling provision is seamless across street type boundaries.

The proposed network for SM is quite extensive, which is in detail described in Section 6.3. Due to the extent of implementing such a network, it is most likely that this will happen through a range of projects. When portions of the network are constructed, the start and finish as well as access to these facilities must be logical and connected to a wider system. Another important feature for the success of any bicycle road network is how crossings are treated. These are also normally the locations where access is gained to the bicycle path. It is vital that access be effortless and the transitions smooth.

The contextual analysis revealed that bicycle parking is insufficient and needs to be expanded. Therefore, strategically located bicycle parking needs to be provided especially in Stellenbosch CBD. Locations have to be aligned with the initiatives of the University. It is also important that locker facilities are robust and provided in a safe environment to reduce the risk of theft.

[13] Department of Transport, Pedestrian and Bicycle facility Guidelines, 2003.

Figure 45: Existing u-rack bicycle parking at Eikestad Mall which is safe but in this location partially blocked by cars

Figure 46: Existing bicycle parking on campus which does not allow for both the wheel and frame to be secured which can lead to increased theft

5.3 Network Extent

The overall extent of the proposed NMT network for SM is detailed in Table 4. The network proposals are extensive with a total length of 280km. Of that, 70% of the proposed infrastructure is located with the wider Stellenbosch Town area. The proposed NMT network is depicted in a series of maps for Stellenbosch and surrounds, Klapmuts, Pniel, Lanquedoc, Franschhoek and Raithby. Refer to Figure 47 - Figure 57. For better quality images refer to Annexure A.

Table 4: Extent of proposed NMT network

	Whole Stellenbosch Municipality **Length (km)**	**Stellenbosch Town** (incl. Kayamandi, Jamestown) **Length (km)**
Proposed Sidewalk	31	11
Proposed NMT Only Class 1	26	17
Proposed NMT facilities with Partial Separation Class 2	172	103
Proposed bicycle lanes (Partial or Marked Separation) Class 3	14	14
Proposed cycling in local street (Mixed Shoulder) Class 4	32	28
Proposed Pedestrian Priority Street	4.2	3.8
Total (km)	**279**	**176**

Note:
1) Cycling in shoulder is excluded from this list.
2) All lengths refer to centreline length, except for Sidewalks.
3) Intersection upgrades are excluded from the length summary.

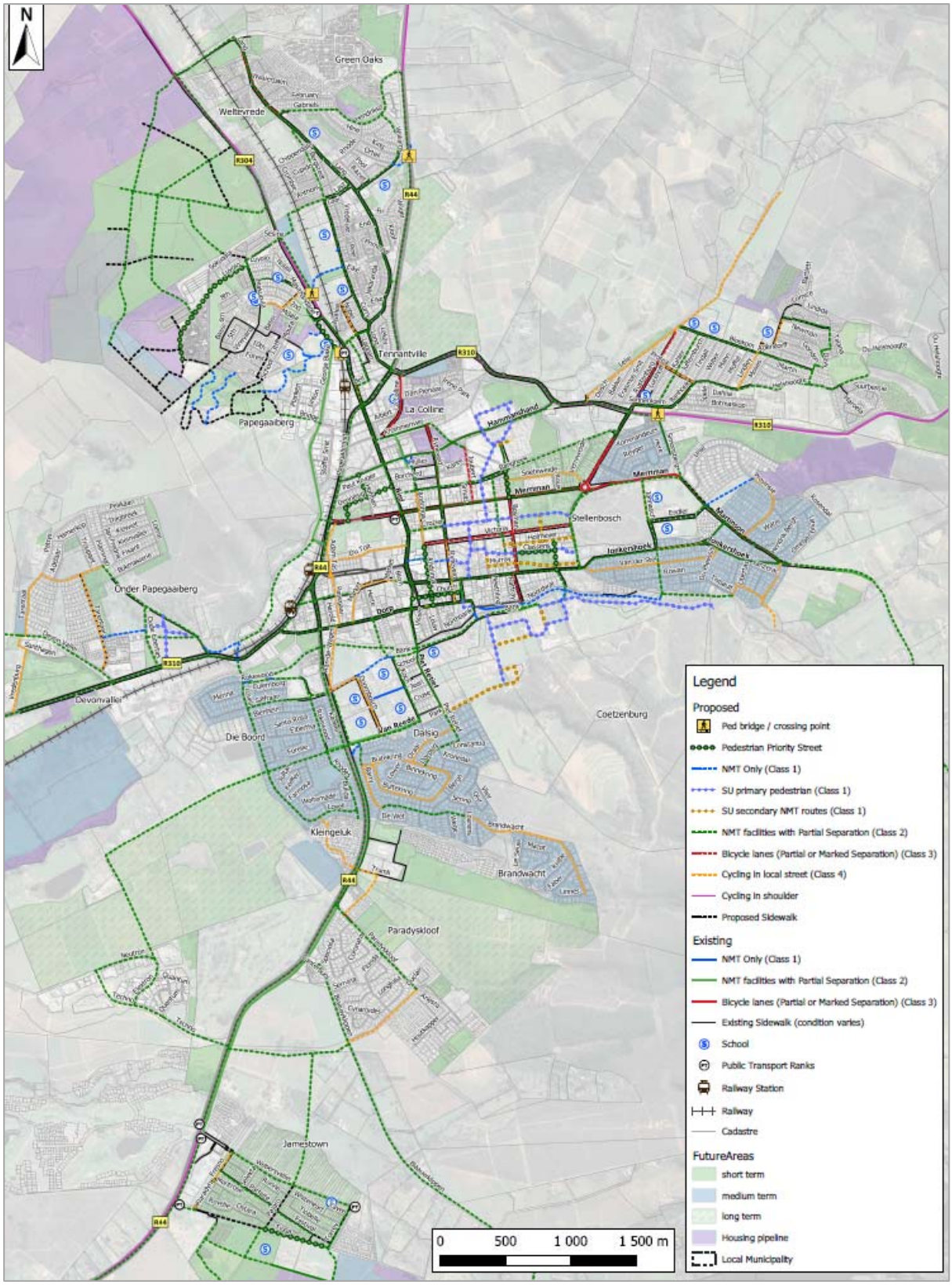


Figure 47: Stellenbosch Town: Proposed NMT Network

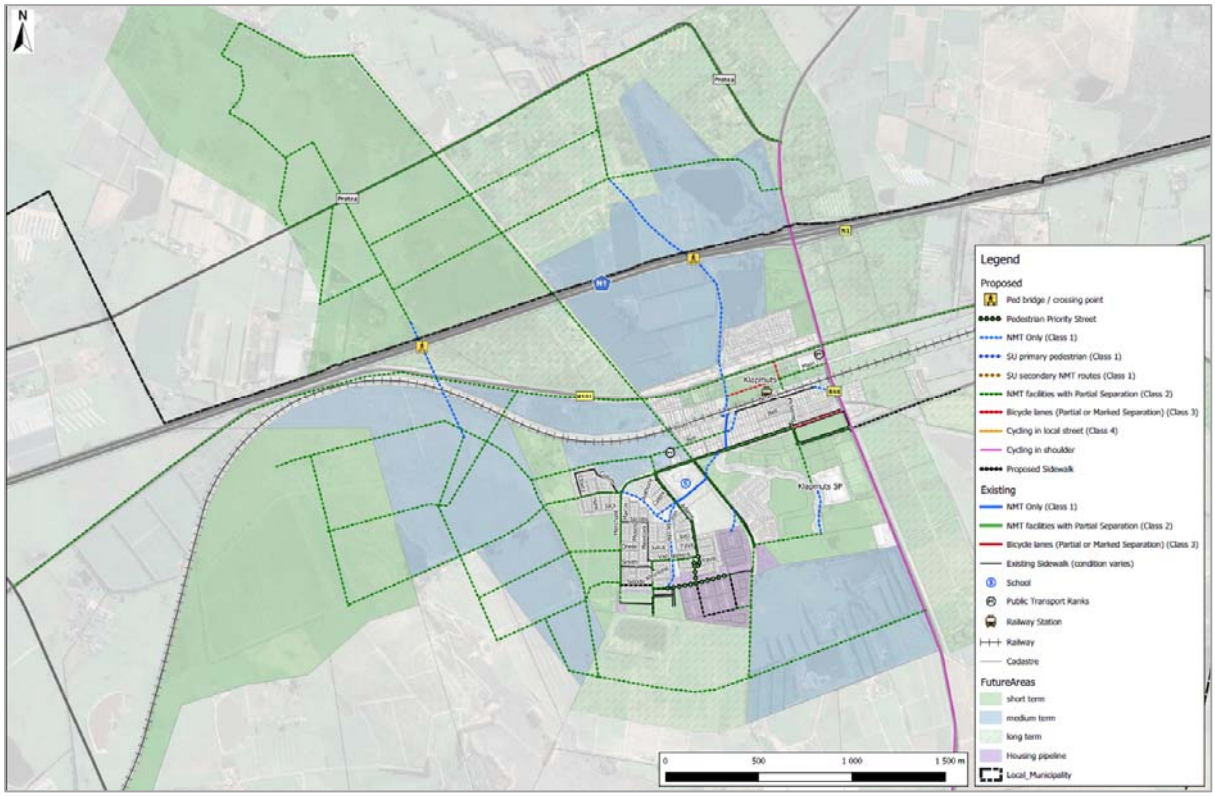


Figure 48: Klapmuts: Proposed NMT Network

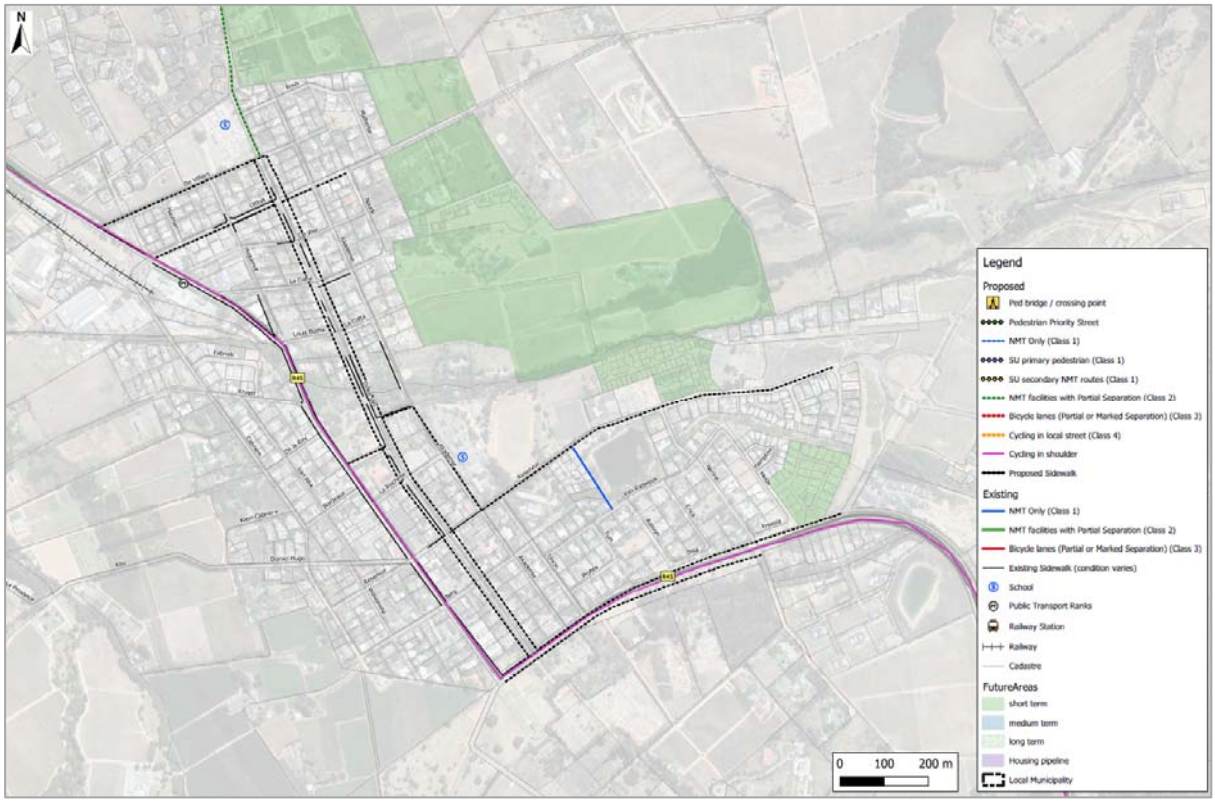


Figure 49: Franschhoek: Proposed NMT Network

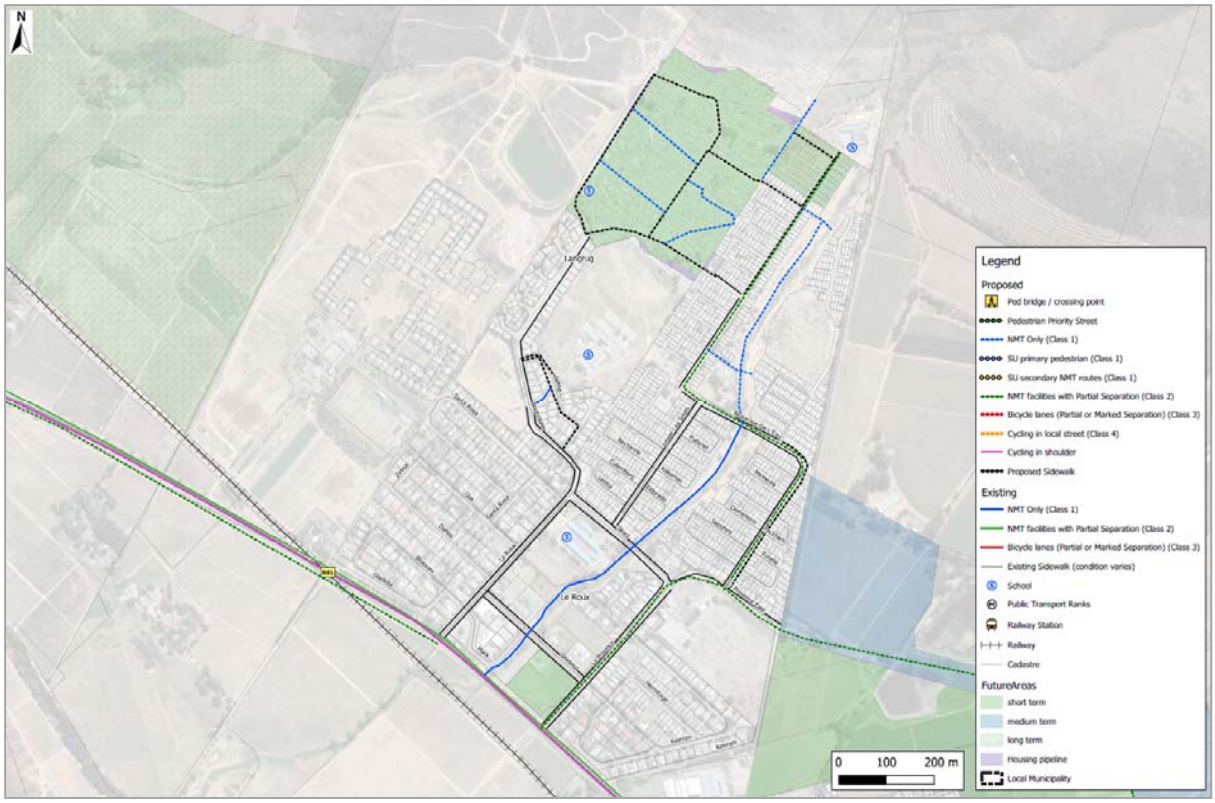


Figure 50: Groendal: Proposed NMT Network

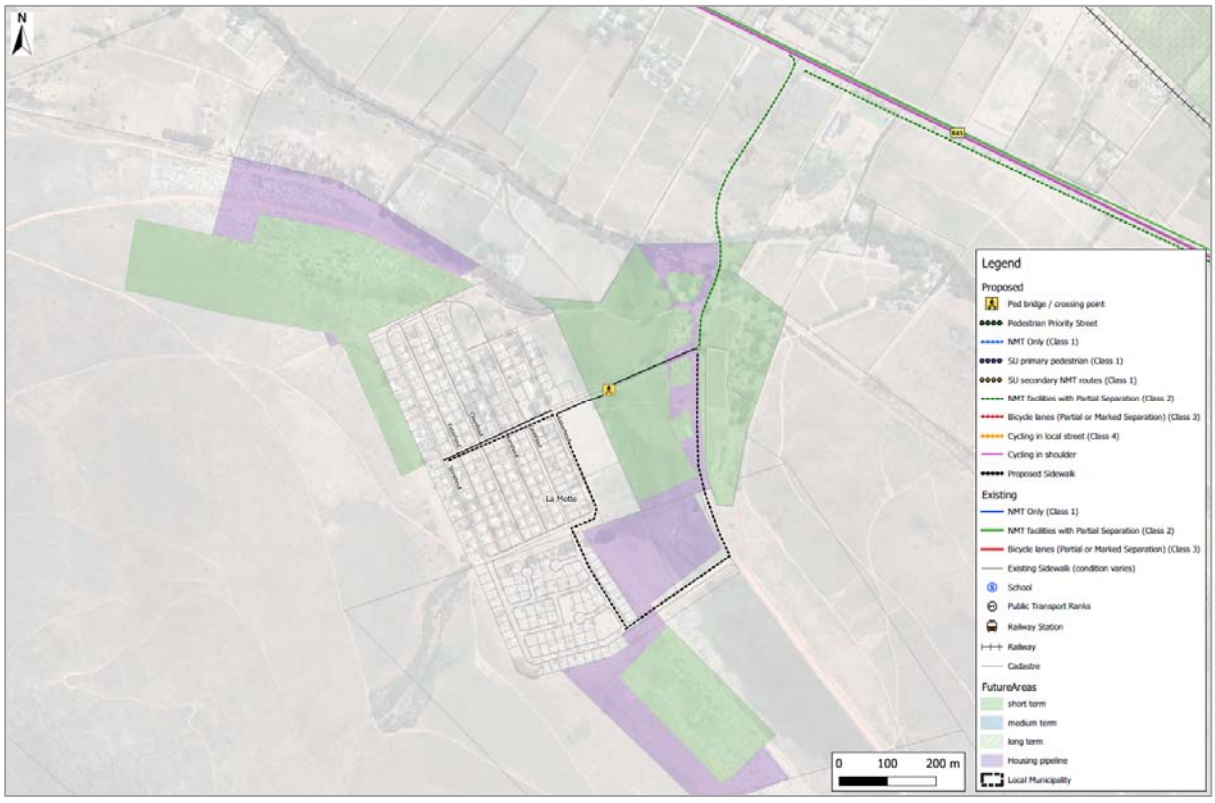


Figure 51: La Motte: Proposed NMT Network

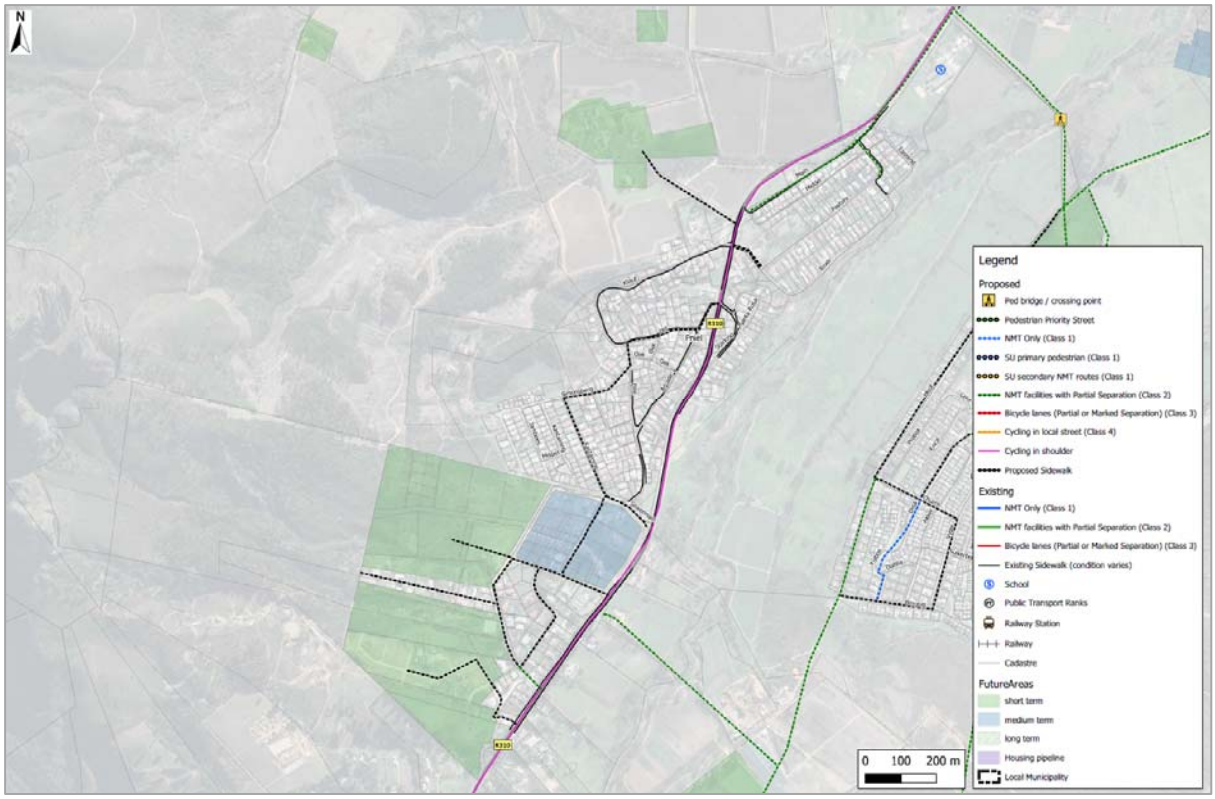


Figure 52: Pniel: Proposed NMT Network

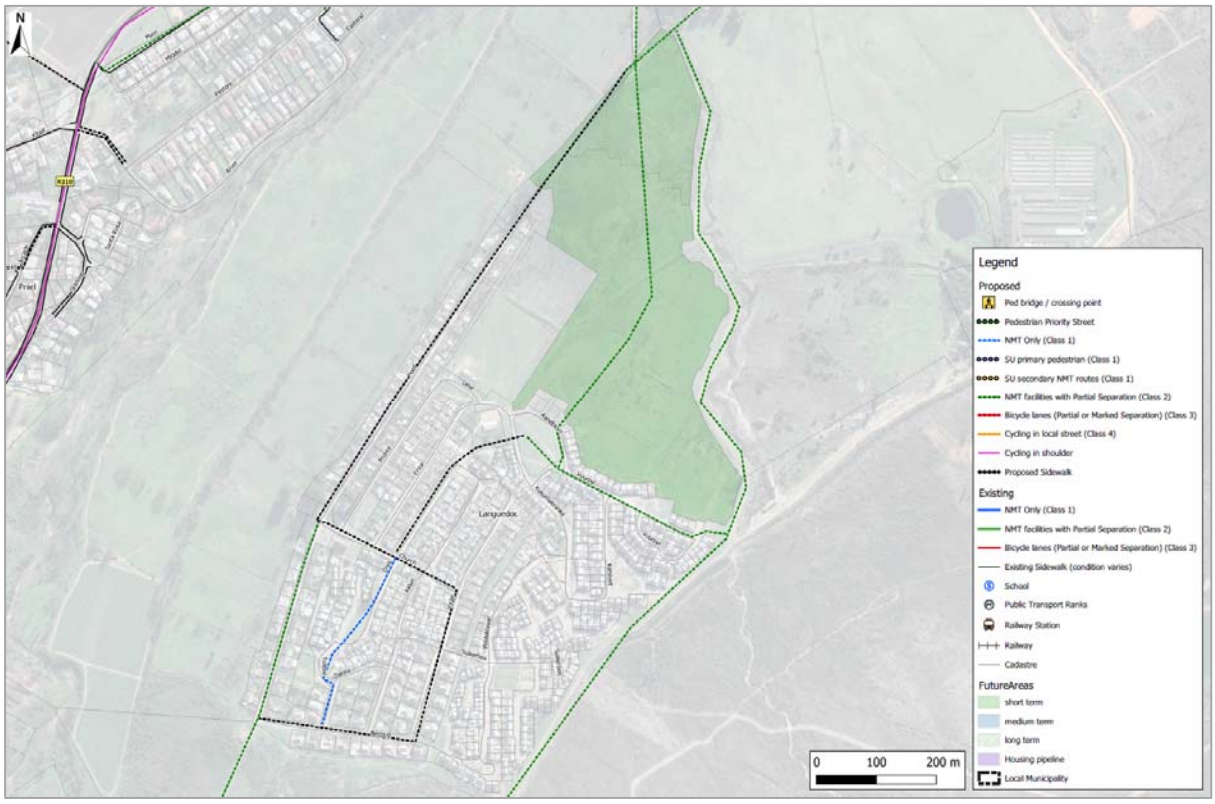


Figure 53: Lanquedoc: Proposed NMT Network

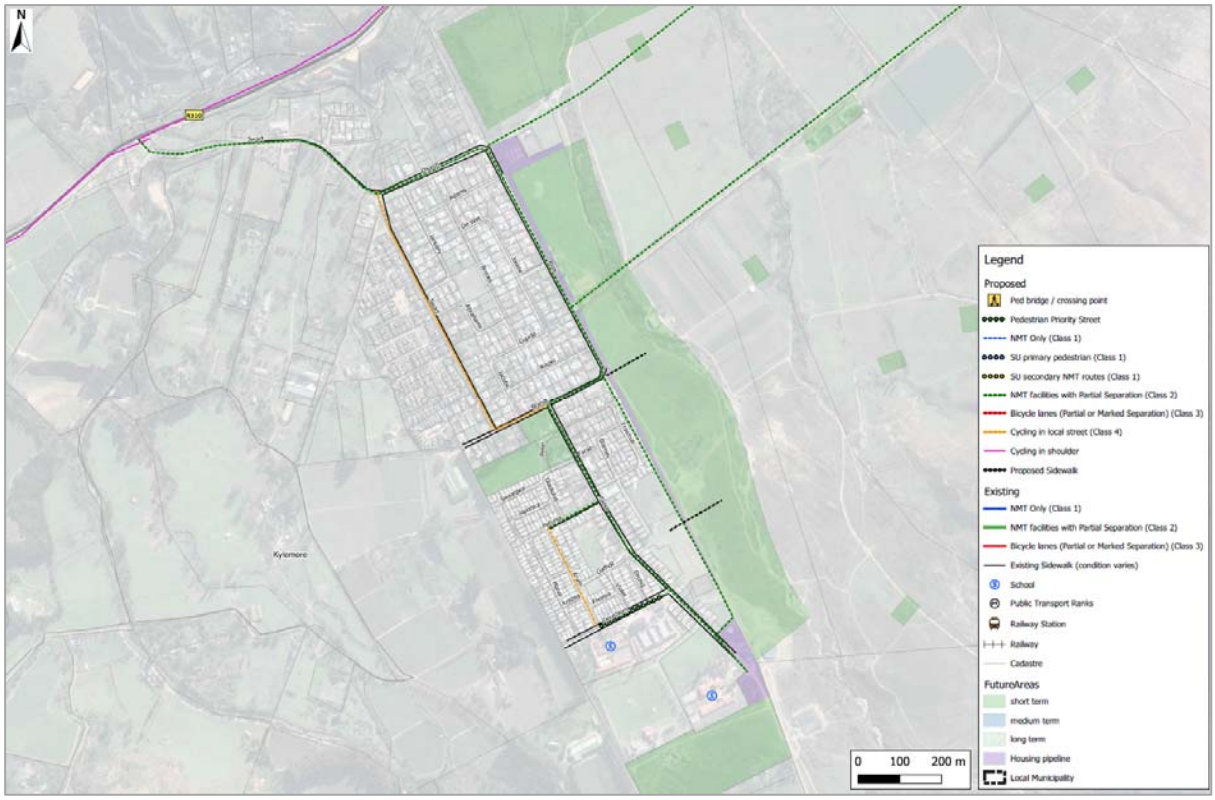


Figure 54: Kylemore: Proposed NMT Network

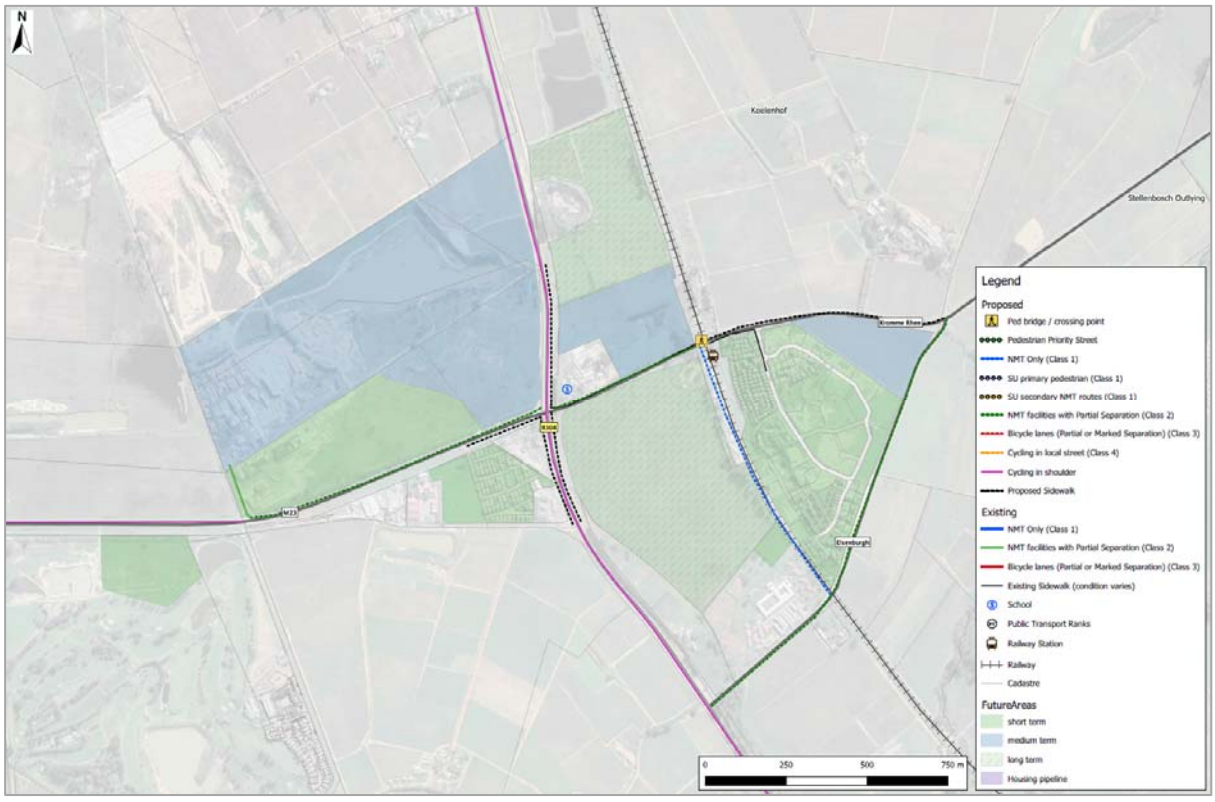


Figure 55: Koelenhof: Proposed NMT Network

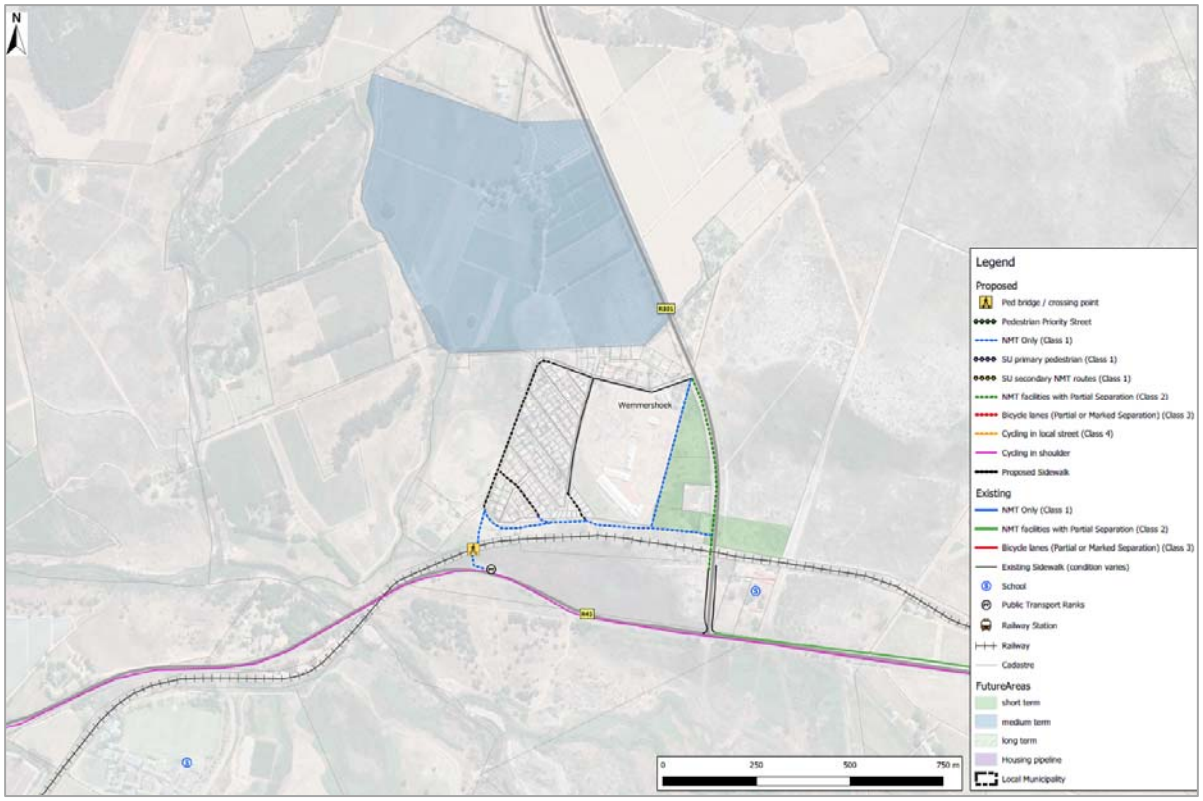


Figure 56: Wemmershoek: Proposed NMT Network

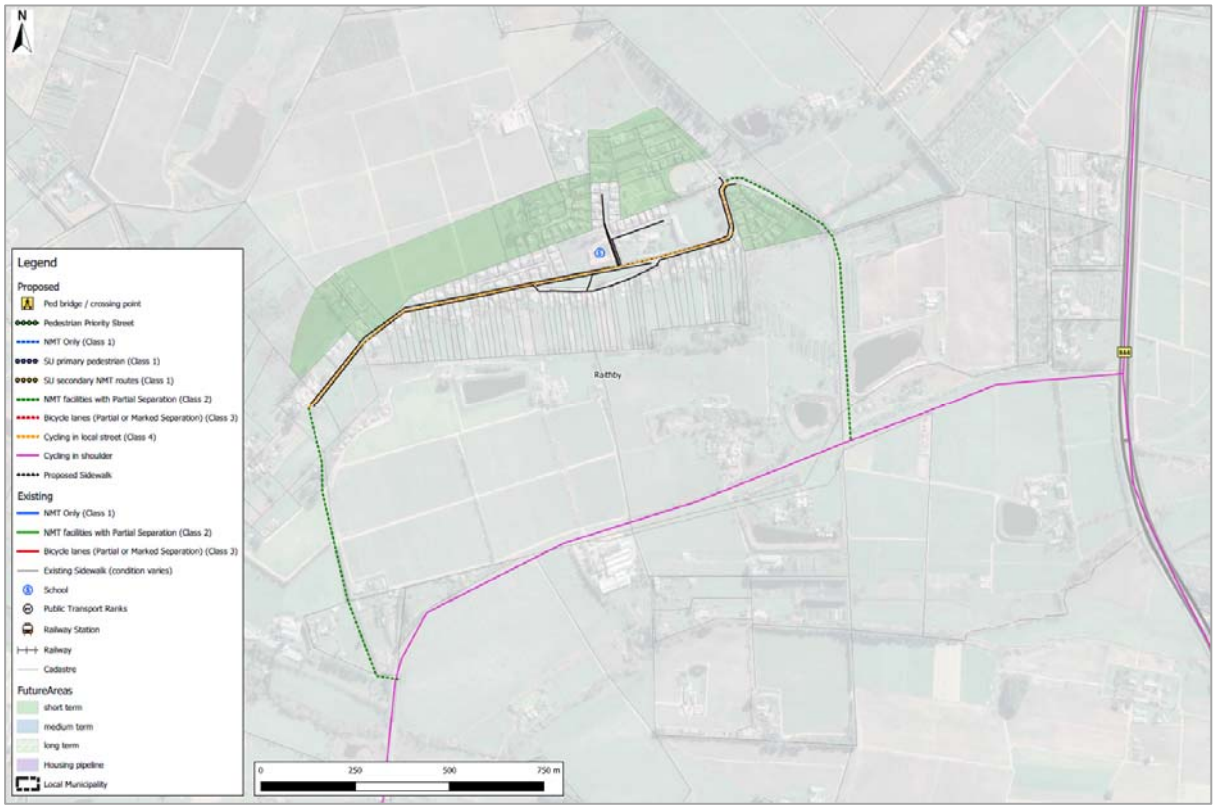


Figure 57: Raithby: Proposed NMT Network

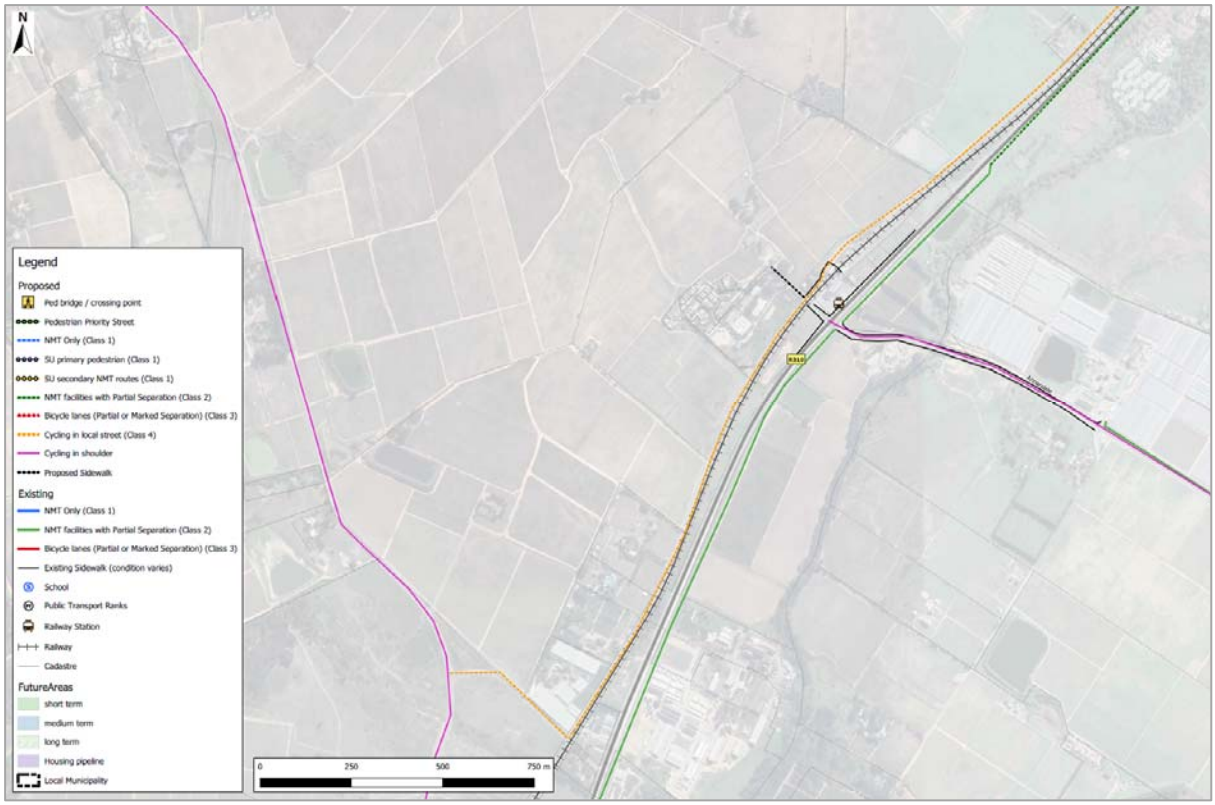


Figure 58: Lynedoch: Proposed NMT Network

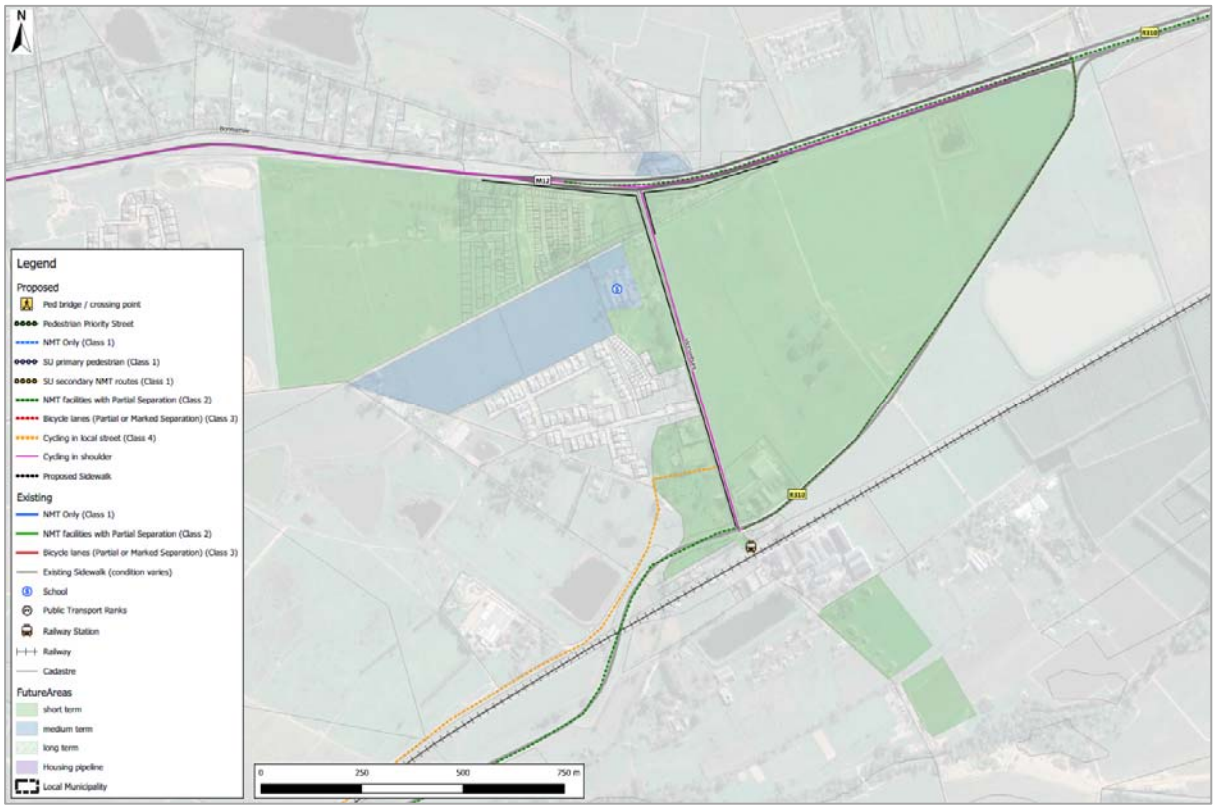


Figure 59: Vlottenburg: Proposed NMT Network

6 IMPLEMENTATION PLAN

6.1 Short-Term Projects

Considering the current municipal budget constraints and the phasing of implementation, only short-term proposals were extracted from the overall NMT Network, and cost estimates prepared. The short-term projects were further refined into (1) essential and (2) desirable NMT interventions. **Only these short-term projects were included in the Implementation Plan.**

The extent of the proposed short-term pedestrian and cycle routes amount to 28km (10% of the total network of 280km). Of that, 70% of the proposed infrastructure is located in the wider Stellenbosch town area. Over time as the portions of the route are implemented, it will ultimately form a coherent NMT Network.

Table 5: Extent of proposed NMT network

	Whole Stellenbosch Municipality **Length (km)**	**Stellenbosch Town** (incl. Kayamandi, Jamestown) **Length (km)**
Proposed Sidewalk	31	11
Proposed NMT Only Class 1	26	17
Proposed NMT facilities with Partial Separation Class 2	172	103
Proposed bicycle lanes (Partial or Marked Separation) Class 3	14	14
Proposed cycling in local street (Mixed Shoulder) Class 4	32	28
Proposed Pedestrian Priority Street	4.2	3.8
Total (km)	**279**	**176**
Short-term - Essential	10	7
Short-term - Desirable	18	13
Total short-term	**28**	**20**

Note:
1) Cycling in shoulder is excluded from this list.
2) All lengths refer to centreline length, except for Sidewalks.
3) Intersection upgrades are excluded from the length summary.

The following projects form part of the NMT short-term proposals (listed in Table 6). Also refer to Figure 60 - Figure 64, which display the short-term proposals on a map.

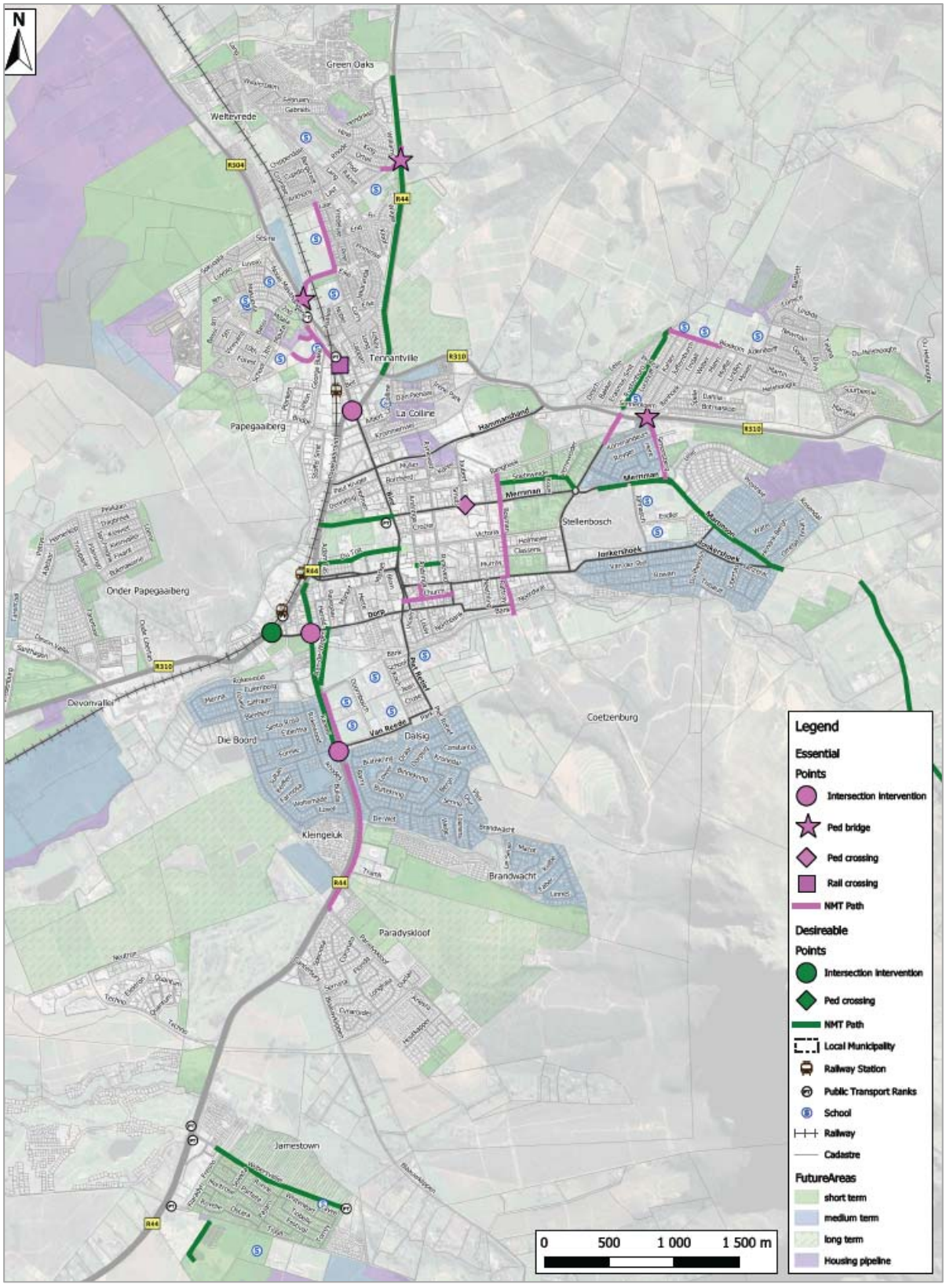


Figure 60: Wider Stellenbosch Town: Short-Term Proposals

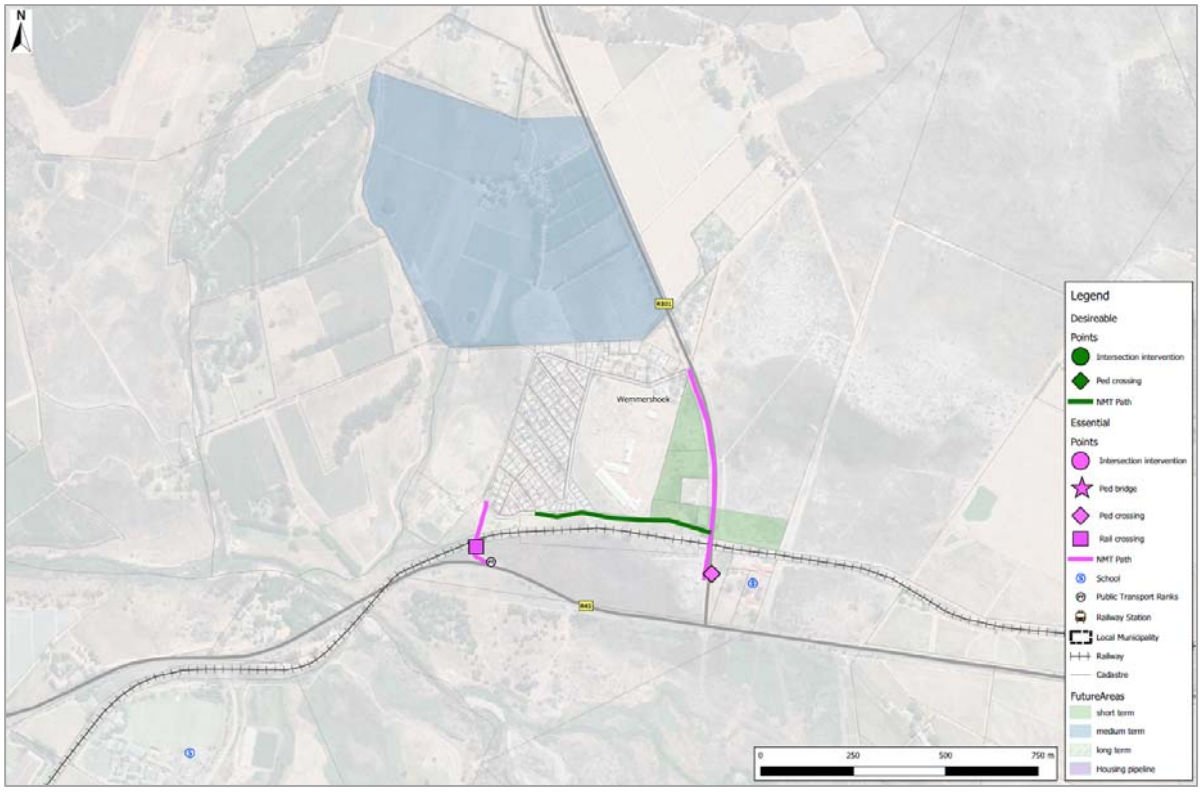


Figure 61: Wemmershoek: Short-Term Proposals

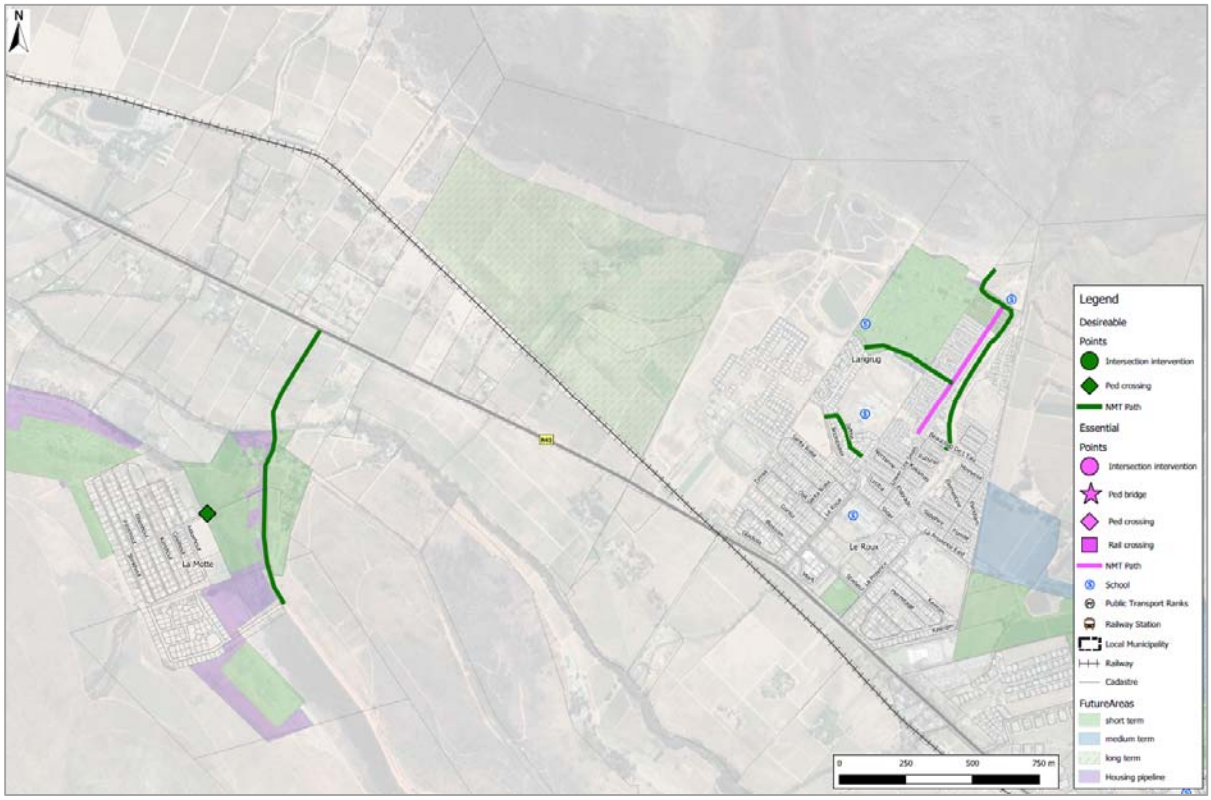


Figure 62: La Motte/ Groendal: Short-Term Proposals

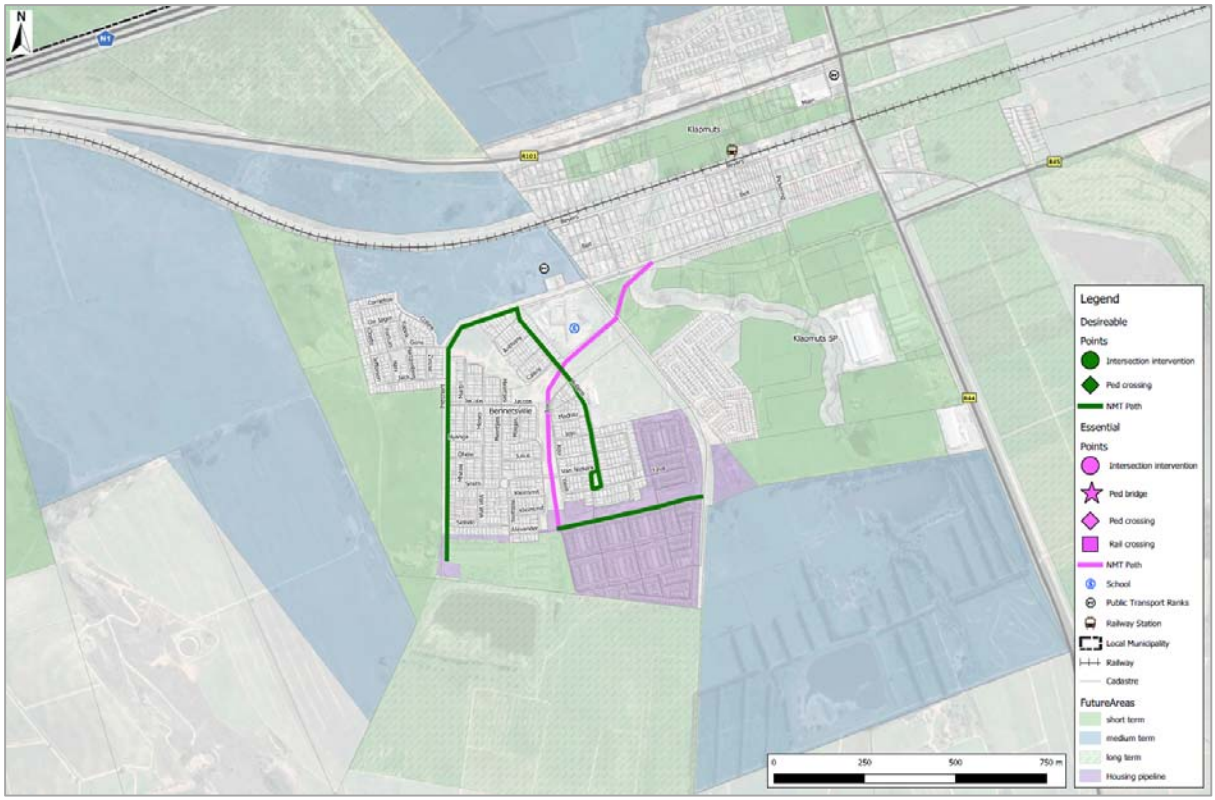


Figure 63: Klapmuts: Short-Term Proposals

Figure 64: Kylemore: Short-Term Proposals

Table 6: Details of NMT Short-Term Projects for SM

Project No.	Projects
1	Pedestrianisation of Church St and Andringa St
2	Decluttering of street furniture in Stellenbosch CBD and dropped kerb standardisation
3	Roll-out of bicycle network in Stellenbosch CBD (Continuity of cycle routes, road markings, bi-directional cycling in one way streets, bicycle parking)
4	Pedestrian bridge across R304 & rail line linking Kayamandi and Cloetesville
5	Kayamandi Rand St: Pedestrian priority, restrict heavy vehicle access, narrow road to 6,5m (from ~9m wide black top), raised ped crossing; Brick pave 4m wide NMT route up to to railway crossing
6	Kayamandi: Safe ped link across railway line at Du Toit Station (grade separated crossing; either pedestrian bridge or crossing as part of Kayamandi mall upgrade)
7	Kayamandi: Staircases parallel to Rand Rd north-east of stadium
8	Kayamandi: Staircases west of stadium and 3m wide footpath up to Rand St (market area)
9	Pedestrian bridge across Helshoogte Rd (R310) at Simonsberg St to provide safe crossing for scholars
10	Bosman St: Extend effective sidewalk width and provide bi-directional cycle lane (Phase 1 between Banhoek and Merriman, Phase 2 Merriman and Van Riebeeck)
11	Soeteweide St: Restrict access to local traffic only and provide safe pedestrian space
12	Merriman Ave: Investigation into ped crossing to mitigate current safety concerns
13	Merriman Ave: Extension of existing cycle lane up to Adam Tas
14	Die Laan: Extend effective sidewalk width and provide bi-directional cycle lane
15	R44: Provide 3m wide footpath on western side of the R44 (from Lang Rd to Welegevonden)
16	R44: Provide footpath (Extension of Ortell Rd in Cloetesville to the east) and bridge over R44
17	Curry Rd: Extend sidewalk space on eastern side by 1) widening existing sidewalk and by 2) reducing drop-off area by installing delineated kerb
18	Bloekom St: Improved traffic calming in front of school and extend existing sidewalk
19	Extend Bicycle Lane from Cluver Rd along Rustenberg Rd and extend sidewalk where space allows
20	Cluver Rd: Provide smooth transition of bicycle lane onto sidewalk space on both sides of the road, widen sidewalk to convert into Bicycle Class 2
21	Upgrade NMT route through Eikestad Mall outside parking area; investigate re-arrangement of parking
22	Aan die Wagenweg: Upgrade of bicycle path and sidewalk space
23	Van Rheede/ R44 Intersection: Improve pedestrian safety
24	R44: Provide footpath on eastern side of the R44 (from Doornbosch to Dorp) incl. ped bridge over Eerste River
25	R44: Upgrade footpath on eastern side of the R44 (from Paradyskloof to Doornbosch)
26	Merriman Ave: Proposed shared footpath on southern side of the road (from Cluver to Simonsberg)
27	Simonsberg Rd: Provide shared facility & Implementation of traffic calming measures
28	Martinson Rd: Narrowing of road with a separate two-way bicycle facility (4m wide Class 3) on southern side between Omega Rd and Simonsberg Rd; incl. gateways and sidewalk on northern side
29	Jonkershoek Rd: Upgrade of shared footpath (widen and resurface southside path where space allows) and provide lighting
30	Bird St/ Adam Tas (R44) Intersection: Improve pedestrian safety
31	Strand St. R44/ Dorp St Intersection: Improve pedestrian safety
32	Adam Tas (R301)/ Dorp St Intersection: Improve pedestrian safety

Project No.	Projects
33	Jamestown Webbersvallei Rd: Provide 3m wide shared facility on northern side
34	Jamestown Drakensberg Rd: Provide shared NMT Facility
35	Koelenhof: Investigation into safe ped crossing at railway line
36	Kylemore Swart Rd: Extend existing sidewalk up to Helshoogte Road
37	Kylemore Gousblom St: Widen pedestrian space at school entrance
38	Kylemore Petunia St: Widen existing sidewalk on southern side, potentially convert into one-way street
39	Lanquedoc: Provide shared NMT facility as part of Class 2 as part of the Upgrading of the Lanquedoc Access Road (SRMP078)
40	Klapmuts: Shared NMT path along Klapmuts River (off-road)
41	Klapmuts Adams St: Widen existing sidewalk on western side
42	Klapmuts Alexander St: Widen existing sidewalk and traffic calming measures
43	Klapmuts Merchant St: Widen existing sidewalk on eastern side (use full effective width) and convert into shared NMT facility
44	Groendal Upper Lea Smit Rd: Upgrade sidewalks and introduce traffic calming
45	Groendal Stiebeuel River: Provide shared NMT facility along river on western side from existing NMT path to Dalubuhle school
46	Groendal Jafthas St: Sidewalk along Jafthas St from Boonzaaier to Groendal High School (including ped crossing)
47	Groendal Davids St: Extend sidewalk by means of delineated kerb
48	Groendal: Provide staircase and NMT route from higher lying informal area down to Dalubuhle Primary School
49	La Motte Robertsvlei Rd: Provide 3m wide shared facility on western side of Robertsvlei Rd (to be included in SRMP033)
50	La Motte Main Rd: Provide pedestrian crossing
51	Franschhoek Main Road (R45): Upgrade existing pedestrian crossing points
52	Wemmershoek: Rail crossing - Formalise path to PT stop on R45
53	Wemmershoek: Formalise footpath on the western side of the R301 up to Wemmershoek access and pedestrian crossing at school access road
54	Wemmershoek: Formalise footpath on southern end of Wemmershoek up to school

Note:

1) Projects 1-34 are located within the wider Stellenbosch town area.

6.2 Possible Design Solutions

Various design solutions/ interventions were considered based on the following assumptions.

- **Low Cost Infrastructure**: Considering the vast extent of the proposed network, it is essential to ensure that implementation is done in a relatively cost-effective manner. It inter alia includes the extension of sidewalk space by means of a delineated kerb. The cost estimates incorporate those solutions at suitable locations. Refer to Figure 65 and Figure 66.
- **Safe cycling:** In places where a bicycle lane in the road is proposed, and there is sufficient space available in the roadway, and a painted separation is not a safe option; a delineated kerb can be installed to provide a safe cycling environment. It additionally reduces informal parking on-street or on the sidewalk. Refer to Figure 68.

- **Direct Access**: Where there are strong pedestrian desire lines across steep terrain (Kayamandi and Groendal, Franschhoek), a staircase with a wheeling ramp can be considered (see Figure 70). This is a cost-efficient option and if aligned correctly, can improve access to a large portion of people. Refer to Figure 69 which shows the existing desire line in Kayamandi up to Enkanini (8 000 – 10 000 residents).
- **Safe Crossing Points**: Provide safe crossing points for pedestrians across major arterials and railway lines. In most places where high NMT activity is observed, a pedestrian bridge is proposed. Signalisation improvements are also essential elements in addressing pedestrian safety.

Figure 65: Example: "Pedestrian lane" – Extend sidewalk space close to schools, along local streets

Figure 66: Potential location of a "Pedestrian lane" in Groendal, Franschhoek

Figure 67: Physical separation between a bi-directional bicycle route and the roadway (Example: Nairobi in Kenya)

Figure 68: Local example of delineated kerb separation (R27 towards Melkbosstrand)

Figure 69: Kayamandi: Existing desire line to reach higher lying settlements (towards Enkanini)

Figure 70: Proposed staircases with wheeling ramp to formalise access at locations of a steep slope gradient

Figure 71: Illustration of potential staircase connection & walkway in Kayamandi serving the pedestrian desire line from Mjandana St east of the stadium towards Rand St/ G Blake St

An indicative cost estimate of the NMT proposals is provided in Section 7.3. The cost estimate is based on unit rates and is based on the above-mentioned assumptions and input parameters.

6.3 Cost Estimate of Short-Term Projects

The proposed short-term NMT linkages cover 28km and their construction costs are estimated at **R114.5 million**. This is inclusive of contingencies (15%), PGEs (20%), landscaping (10%), and signage (5%). The total short-term project costs amount to R126.3 million which includes 10% for professional fees. The above is the total cost of short-term projects, i. e. including essential and desirable projects.

Continuous maintenance of NMT infrastructure is critical and visual inspections must be done annually. Therefore, 10% of the construction costs was added for annual maintenance. Refer to Table 7 for the breakdown of the Project Cost Estimate per local area. A more detailed breakdown per individual project is provided in Annexure B.

Table 7: Project Cost Estimate of short-term projects per area

			5%	10%	20%	15%		10%	
	Length (m)	***Cost***	Roadmarkings and Signage	Landscaping	Prelim & General Expenses	Contingencies	***TOTAL CONSTRUCTION COST***	Professional fees	***Total project costs incl fees***
CBD Stellenbosch Town	13 318	R8 186 532	R409 327	R818 653	R1 637 306	R1 227 980	R38 682 768	R4 208 922	**R42 891 691**
Kayamandi	425	R7 877 516	R393 876	R787 752	R1 575 503	R1 181 627	R29 998 074	R2 999 827	**R32 997 901**
Cloetesville	3 330	R6 141 047	R307 052	R614 105	R1 228 209	R921 157	R16 480 037	R1 648 012	**R18 128 048**
Idasvalley	1 455	R6 174 726	R308 736	R617 473	R1 234 945	R926 209	R9 262 089	R926 209	**R10 188 298**
Jamestown	1 450	R3 149 260	R157 463	R314 926	R629 852	R472 389	R4 723 891	R472 389	**R5 196 280**
Koelenhof	0	R51 172	R2 559	R5 117	R10 234	R7 676	R76 757	R7 676	**R84 433**
La Motte	1 305	R1 795 972	R89 799	R179 597	R359 194	R269 396	R2 693 957	R269 396	**R2 963 353**
Groendal	2 835	R3 791 881	R189 594	R379 188	R758 376	R568 782	R5 687 822	R568 782	**R6 256 604**
Franschhoek	0	R95 226	R4 761	R9 523	R19 045	R14 284	R142 839	R14 284	**R157 123**
Wemmershoek	1 168	R1 909 957	R95 498	R190 996	R381 991	R286 494	R2 864 935	R286 494	**R3 151 429**
Kylemore	505	R259 734	R12 987	R25 973	R51 947	R38 960	R389 601	R38 960	**R428 561**
Lanquedoc	*Included in the Roads Masterplan Project List*								
Klapmuts	2 358	R2 338 257	R116 913	R233 826	R467 651	R350 739	R3 507 386	R350 739	**R3 858 125**
TOTAL SM	**28 149**						**R114 510 157**	R11 791 689	**R126 301 846**

add OPEX Maintenance: R11 451 016 per annum estimated

Note:

1) Costs are 2020 Rand.
2) Maintenance is costed at 10% of Total Construction Cost.
3) Professional Fees are estimated at 10% of the Total Construction Costs..

The cost per infrastructure element is depicted in Figure 72 as well as in Table 8. The construction of safe crossing points and provision of shared pedestrian and cycle facilities comprise the bulk of the Total Construction Costs and amount to 43% and 39% respectively of the Total Construction Costs. Pedestrian specific infrastructure such as sidewalks and pedestrian streets accounts for 11% of the Total Construction Costs and designated bicycle infrastructure amounts to 7%.

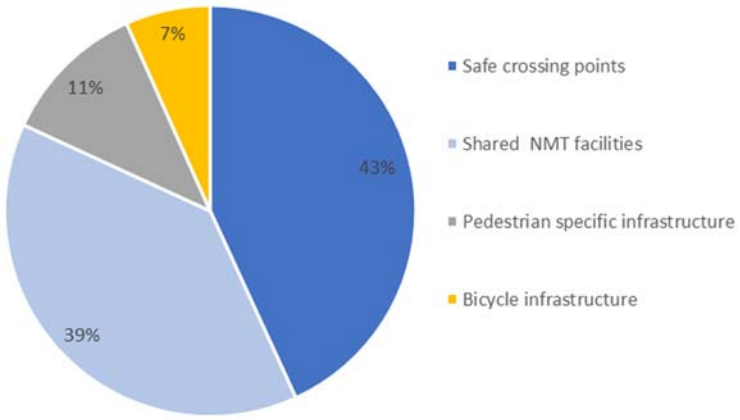


Figure 72: Cost breakdown per infrastructure intervention (whole SM)

Table 8: Cost breakdown per infrastructure intervention (whole SM, construction costs)

		STELLENBOSCH MUNICIPALITY ***TOTAL CONSTRUCTION COST***		
Shared NMT facilities	NMT Only - Bicycle Class 1	R10 050 922	R44 336 050	39%
	Partial Separation - Bicycle Class 2	R34 285 128		
Bicycle infrastructure	Bicycle Class 3	R3 644 067	R7 644 067	7%
	CBD bicycle network	R4 000 000		
Pedestrian specific infrastructure	Sidewalk	R7 574 860	R13 108 724	11%
	UA corrections	R4 642 839		
	Pedestrian Street	R891 025		
Safe crossing points	Pedestrian bridge	R34 274 925	R49 421 316	43%
	Pedestrian crossing	R7 120 429		
	Rail crossing	R8 025 962		
		R114 510 157	**R114 510 157**	

The above reflects the total cost of short-term projects, i.e. including essential and desirable projects. If only the **essential projects** are extracted, the Total Construction Cost **amount to R65.7 million**. This represents close to 60% of the cost to implement all short-term projects. The cost breakdown per area is as follows (refer to Table 9). Refer to Figure 73 for the locations of the proposed interventions.

Table 9: Project Cost Estimate of short-term projects per area – Essential projects only

			5%	*10%*	*20%*	*15%*		*10%*	
	Length (m)	***Cost***	Roadmarkings and Signage	Landscaping	Prelim & General Expenses	Contingencies	***TOTAL CONSTRUCTION COST***	Professional fees	***Total project costs incl fees***
CBD Stellenbosch Town	4 503	R2 580 902	R129 045	R258 090	R516 180	R387 135	R13 310 262	R1 621 660	**R14 931 922**
Kayamandi	425	R7 877 516	R393 876	R787 752	R1 575 503	R1 181 627	R29 998 074	R2 999 827	**R32 997 901**
Cloetesville	1 000	R6 141 047	R307 052	R614 105	R1 228 209	R921 157	R9 211 570	R921 157	**R10 132 727**
Idasvalley	810	R5 567 972	R278 399	R556 797	R1 113 594	R835 196	R8 351 957	R835 196	**R9 187 153**
Jamestown	*Included in the Roads Masterplan Project List*								
Koelenhof	0	R51 172	R2 559	R5 117	R10 234	R7 676	R76 757	R7 676	**R84 433**
La Motte	*Included in the Roads Masterplan Project List*								
Groendal	1 200	R651 172	R32 559	R65 117	R130 234	R97 676	R976 757	R97 676	**R1 074 433**
Franschhoek	*No essential projects identified*								
Wemmershoek	708	R1 170 707	R58 535	R117 071	R234 141	R175 606	R1 756 060	R175 606	**R1 931 666**
Kylemore	505	R259 734	R12 987	R25 973	R51 947	R38 960	R389 601	R38 960	**R428 561**
Lanquedoc	*Included in the Roads Masterplan Project List*								
Klapmuts	613	R1 118 120	R55 906	R111 812	R223 624	R167 718	R1 677 179	R167 718	**R1 844 897**
TOTAL SM	**9 764**						**R65 748 219**	R6 865 475	**R72 613 694**

add OPEX Maintenance: R6 574 822 per annum estimated

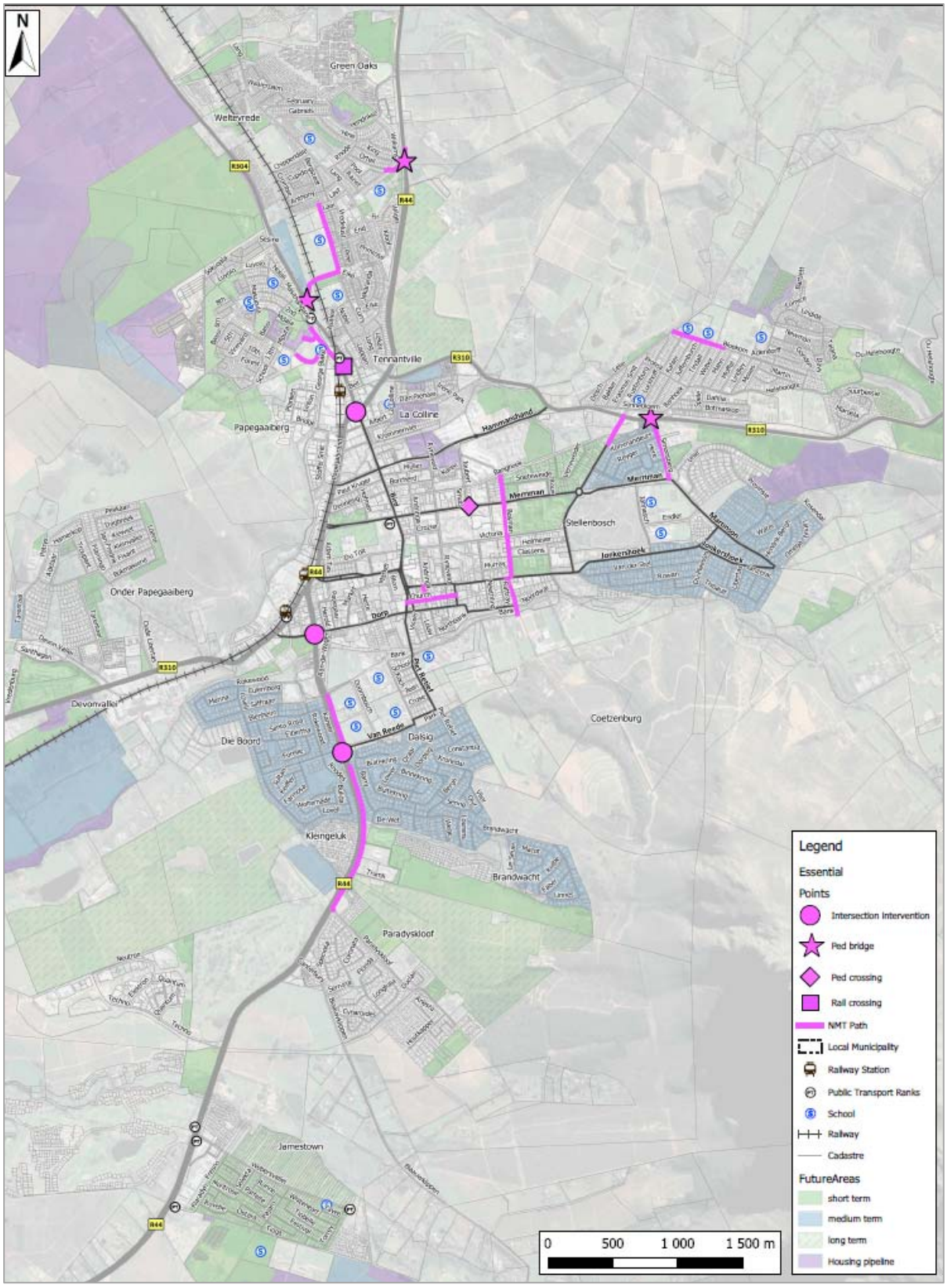


Figure 73: Stellenbosch Town: Essential short-term projects

7 CONCLUSIONS

Further to the assessments undertaken as part of this project the following conclusions are made.

7.1 Definition of NMT

NMT includes all forms of movement that do not rely on an engine or motor for movement. This includes but is not limited to, walking, cycling and animal-drawn vehicles and wheelchairs[14]. Walking and cycling are the more common forms of NMT usage in Stellenbosch and this is reflected in the municipal NMT Masterplan of 2020. People with 'special categories of need' are also considered[15]. Skateboarding/ longboarding has recently gained popularity among students and is incorporated. The use of animal-drawn carts such as donkey-carts is not an expected transport mode within the urban area of Stellenbosch and is therefore not addressed. There has been an increase in the popularity of electrically assisted cycles and electrically powered personal vehicles such as electric bicycles[16] and e-scooters. Worldwide such mobility devices with a supportive power unit have become part of the urban streetscape.

7.2 Project Objectives

The primary scope and objective of the project is the consolidation of Stellenbosch's NMT Masterplan and Cycle Plan (both prepared in 2015), the update thereof and the development of an implementation plan, as well as the preparation of NMT/Cycle strategies and policies.

7.3 Walking and Cycling in Stellenbosch currently

Stellenbosch Municipality has adopted a vision towards car-free living and has adopted an approach to encourage public transport, walking and cycling. Some towns in this area, especially Stellenbosch CBD, has a rich culture of walking and cycling and is displayed in the significant amount of walking in the CBD, the public spaces, the street cafes and restaurants. However, this rich urban vibrancy is under threat of being diluted by an ever-increasing dependency on private car usage with streets prioritizing the needs of vehicles over that of pedestrians.

There are many factors that are advantageous for Stellenbosch in ensuring that this culture is retained.

- The historically disadvantaged communities situated on the outside of Stellenbosch (Cloetesville, Kayamandi, Idas Valley) are located well within walkable distances, from the CBD and streams of people can be seen walking to and from the CBD.
- The University of Stellenbosch responsible for the huge student population living in the town and also encourages students to walk between campuses and residences.
- Stellenbosch CBD also has the "old town" that has become the tourist hub and is primarily centred along Dorp Street with many restaurants spilling over into the street, creating a very pedestrian-friendly atmosphere. Similarly, Franschhoek CBD is also very pedestrian-friendly.
- The CBD environment and surrounding residential areas are all within walkable distances with the university, residences, restaurants, shops, offices, located close to one another.

[14] Department of Transport, NMT Facility Guidelines, 2015.
[15] National Land Transport Act, 2009.
[16] The term electric bicycle is generic and includes pedelecs, e-bikes and combinations of these types. Pedelec refers to a bicycle with a motor that only functions on condition the cyclist pedals, whilst e-bike means a bicycle with a motor that functions by turning the throttle, so irrespective of the cyclist pedalling.

- Stellenbosch Municipality has already implemented various street improvements to calm traffic such as Andringa Street, Victoria Street and the extent to which pedestrians use these streets are prime examples of what can be achieved if the street design of some streets are favoured towards the needs of pedestrians.

However, the roads and streets being used by pedestrians and cyclists are more and more being orientated in favour of vehicles, resulting in unsafe environments for pedestrians and cyclists. In particular, certain focus areas are worth mentioning:

- The pedestrian desire line from Kayamandi to the CBD and Bird Street, across the railway line, is currently the most direct route to get to the CBD. This route is along Rand Street and across the railway line, passing a local shopping hub, a local market, an informal public transport rank at Du Toit Station, making it very desirable. However, the informal crossing of the railway line is unsafe. The alternative route is along the R304, but it is not aligned with the desire line and too far from where people need to be.
- The previously disadvantaged communities on the outskirts of Stellenbosch town (Cloetesville, Kayamandi, Idas Valley) are located beyond major roads; a typical apartheid spatial planning arrangement. The result is that people walking to town has to cross or walk along significant roads and intersections that due to their function, prioritizes the mobility needs of vehicles. For example, the Adam Tas/ Bird Street intersection, the Helshoogte/ Cluver intersection, the pedestrian desire line from Kayamandi to the schools located in the nearby Cloetesville. People from Jamestown also have to walk along the congested Strand Road/ R44. Similarly, the people in Groendal and La Motte in Franschhoek, Pniel, Klapmuts have to walk along major provincial roads to get to the local towns.
- The CBD is fairly pedestrian-friendly with wide sidewalks along most routes, but walking and cycling is not safe with the ever-increasing traffic and parking in the CBD and the old street infrastructure with no dropped kerbs are not suitable for people in wheelchairs, people using trolleys, skateboarders and cyclists.
- Cycling is prominent in Stellenbosch but it dominated by recreational cycling. These cyclists typically favours the high-order provincial roads – Stellenbosch Arterial, the R304, Helshoogte Road and the R45 towards Franschhoek. Portions of a cycle network is implemented along certain sections of roads, but there is no coherent cycling network.

An investigation into the potential of cycling in Stellenbosch town[17] indicated that the main barriers to cycling are traffic safety, the lack of cycling infrastructure and personal safety concerns. The Bicycle Plan further also cites access to bicycles as a barrier for people in lower-income communities. However, not only cyclists are faced with significant dangers along their route, but also pedestrians – particularly in Stellenbosch town - as sidewalks tend to be too narrow, lack continuity and are often obstructed (street furniture, parked cars, etc.). Safe crossing opportunities are also of concern. People with special needs are also confronted with a lack of dropped kerbs at crossings as well as a lack of tactile detection guidance surfaces at pedestrian crossings.

The majority of NMT infrastructure investment has taken place in the town of Stellenbosch with limited facilities available in the suburbs located on the outskirts of the town (specifically in and around Kayamandi). Sidewalks make up the majority of existing NMT facilities. Improvements to the

[17] Stellenbosch Municipality, Cycle Plan for Stellenbosch Town, 2015.

NMT network of the local towns of SM area have been carried out but are limited to shared pathways with pedestrians.

7.4 Vision Statement, Objectives and Strategies

To arrest the gradual prioritisation of cars over people, certain strategies and policies have to be adopted to ensure that non-motorised transport users are prioritized in transport planning and street design. Stellenbosch Municipality has adopted the following vision for pedestrians and cycling:

"Stellenbosch Municipality will strive to develop walkable and cycle-able environments that are safe for all to use and contribute to the mobility needs, economic vibrancy and social health of communities."

This can be translated into the following **Strategic Objectives**:

- Connect the outlying communities with the CBD in a safe and attractive manner and improve safety, access to opportunities and the dignity of these communities.
- Strive towards car-free living in Stellenbosch CBD.
- Achieve a modal shift in the Stellenbosch CBD towards public transport, walkability and cycle-ability.
- Creating dignified living spaces in previously disadvantaged areas

The creation of more livable environments are not sole the responsibility of infrastructure implementers. The transport environment is planned, designed and managed by various departments, officials all responsible for different focus areas within the transport environment. All these implementing agencies are responsible for creating liveable environments. Particular focus areas, along with their leaders, stakeholders and role-players, include the following:

- Planning
- Human Settlements
- Legal Framework
- Infrastructure
- Traffic
- Operations
- Awareness
- Partnerships

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7.5 Legislative and Policy Framework

The legislative framework for NMT policy, planning and implementation in South Africa and in Stellenbosch in particular, is contained in the following:

- National Land Transport Act
- Department of Transport Draft White Paper on Roads Policy including the national NMT Policy
- Draft Revised White Paper on National Transport Policy
- South African Road Traffic Act

- Western Cape Provincial Road Traffic Administration Act
- Stellenbosch Municipality Streets By-law
- The NMT Facility Guideline

These were all considered, but although the strategic role of forms of NMT are highlighted in various pieces of legislation and Amendment Bill, the current provisions in the Road Traffic Act regulations are not broad enough to include a wider definition of NMT users of the sidewalk. The National Road Traffic Act Regulations are very restrictive about the use of sidewalks and it is limited to pedestrians and people in a wheelchair. Cyclists cannot use the sidewalk and bikes with a motor cannot use the street either. Furthermore, the micro mobility options such as sedgeways, scooters and skateboarders are also excluded from using the sidewalks.

It should also be noted that regulation 311 (7) state that *"Whenever a portion of a public road has been set aside for use by persons riding pedal cycles, no person shall ride a pedal cycle on any other portion of such road*". This has implications for the provision of cycling infrastructure and cyclists. Once cycle lanes and paths are provided in the road or on the sidewalk, then cyclists are compelled to use it, including recreational and training cyclists who generally would prefer cycling at higher speeds typically achieved while cycling in the road.

7.6 Network Development

The overall extent of the proposed NMT network are extensive with a total length of 280km. Of that, 70% of the proposed infrastructure is located with the wider Stellenbosch Town area. The proposed NMT network is depicted in a series of maps for Stellenbosch and surrounds, Klapmuts, Pniel, Lanquedoc, Franschhoek and Raithby.

7.7 Implementation Plan

Considering the current municipal budget constraints and the phasing of implementation, only short-term proposals were extracted from the overall NMT Network, and cost estimates prepared. The short-term projects were further refined into (1) essential and (2) desirable NMT interventions. **Only these short-term projects were included in the Implementation Plan.**

The extent of the proposed short-term pedestrian and cycle routes amount to 28km (10% of the total network of 280km). Of that, 70% of the proposed infrastructure is located in the wider Stellenbosch town area. Over time as the portions of the route are implemented, it will ultimately form a coherent NMT Network.