LOCAL INTEGRATED TRANSPORT PLAN

MARULENG LOCAL MUNICIPALITY

2025-2030

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
TRANSPORT AND COMMUNITY SAFETY



PREPARED FOR:	ADDRESS:
MARULENG LOCAL MUNICIPALITY	64 SPRINGBOK STREET HOEDSPRUIT

CHAPTER 3

TRANSPORT NEEDS ASSESSMENT



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3 TRANSPORT NEEDS ASSESSMENT

This chapter determines and describes the transport-related issues, problems and needs of the municipality and its residents based on the following:

a) Assessment of issues, problems, trends and performance standards revealed by the Transport Register.
b) Processes of public participation and stakeholder feedback aimed at identifying the needs of the community, present and future transport demand estimation, determined by extrapolation from current trends, modelling, and/or other estimations.
c) The upgrading and maintenance needs of all roads and public transport facilities for which the planning authority is responsible must be identified.
d) The need for new roads and facilities identified.

Figure 3.1 contains the MLM development corridors and nodes.

The transport needs assessment will be addressed by means of the following subsections as part of this Chapter of the report:

a) Modal split.
b) Public transport.
c) Measures to promote public transport.
d) The needs of learners and persons with special needs.
e) Non-motorised transport.
f) Private Transport.
g) Freight transport.
h) Travel demand estimation.
i) Transport and technology.
j) Road Network.

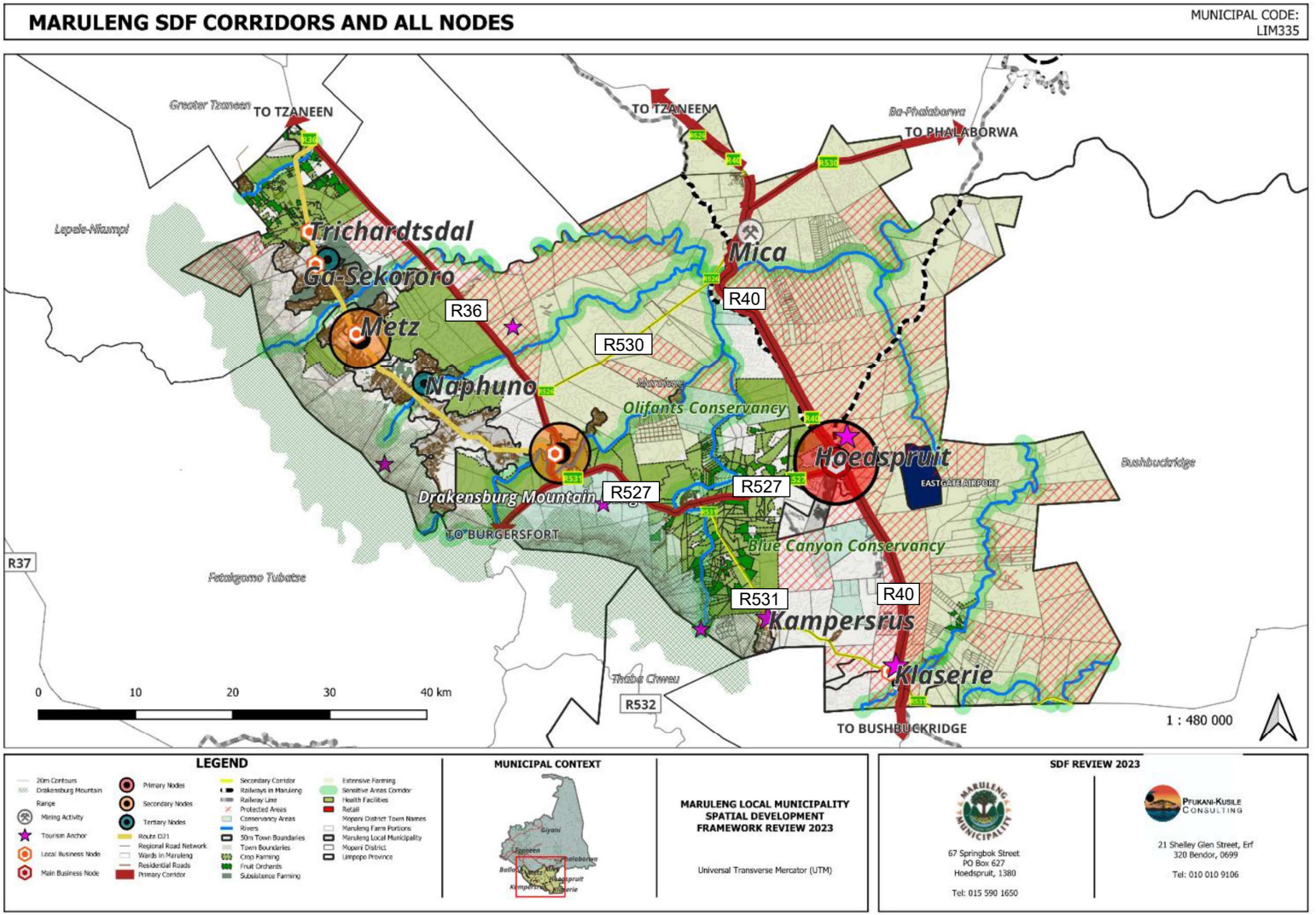


FIGURE 3.1: MLM DEVELOPMENT CORRIDORS AND NODES

3.1 Modal Split

To determine the transport needs it is required to develop an understanding of the modal split between modes, with a specific focus on work trips and educational trips. The modal split for work and educational institution trips is regarded as the most significant. The 2020 National Household Travel Surveys (NHTS) are the only information available. The information is, however, only available on a provincial level.

The subsequent section elaborates on:

a) Modal split for trips to work.
b) Modal split for trips to places of education.

3.1.1 Modal Split for Trips to Work

Table 3.1 contains workers' disability status, geographic location, household income quintile and province by main mode of travel to work by province in South Africa, as obtained from the 2020 NHTS for South Africa per province.

From **Table 3.1** it is possible to note that, nationally, the main mode of transport carrying the largest share of workers is private cars with the workers being the driver 36%, and taxis, which account for 28,1%. Slightly more than one in five workers walked all the way 20,3%, 7,5% travelled by private car as a passenger and another 5,8% travelled by bus.

From **Table 3.1** it is also possible to note that for Limpopo Province, the dominant transport mode was walking (35,9%), Private cars with the workers being the driver is 25.6%, taxis account to 22,9% and buses account to 7,4%.

For the compilation of the **MLM-LITP** it was assumed that the MLM has similar patterns than the Limpopo Province.

TABLE 3.1: WORKERS' DISABILITY STATUS, GEOGRAPHIC LOCATION, HOUSEHOLD INCOME QUINTILE AND PROVINCE BY MAIN MODE OF TRAVEL TO WORK

Indicator		Mode of travel							RSA
		Public transport			Private transport		Walking all the way	Other	
		Train	Bus	Taxi	Car/truck driver	Car/truck passenger			
Worker	Number	151	777	3 753	4 810	997	2 704	159	**13 350**
	Per cent	1,1	5,8	28,1	36,0	7,5	20,3	1,2	**100,0**
Disabled worker	Number	*	23	67	68	27	92	7	**285**
	Per cent	*	7,9	23,6	23,9	9,3	32,4	2,3	**100,0**
Province									
Western Cape	Number	45	131	407	927	196	281	20	**2 008**
	Per cent	2,2	6,5	20,3	46,2	9,8	14,0	1,0	**100,0**
Eastern Cape	Number	3	22	236	326	87	297	9	**982**
	Per cent	0,3	2,3	24	33,2	8,9	30,3	1,0	**100,0**
Northern Cape	Number	*	13	34	107	28	102	5	**289**
	Per cent	*	4,5	11,6	37,0	9,8	35,4	1,7	**100,0**
Free State	Number	*	41	130	203	35	209	9	**628**
	Per cent	*	6,6	20,7	32,4	5,6	33,2	1,5	**100,0**
KwaZulu-Natal	Number	22	115	637	654	177	387	16	**2 008**
	Per cent	1,1	5,7	31,7	32,6	8,8	19,3	0,8	**100,0**
North West	Number	1	36	201	231	51	226	26	**772**
	Per cent	0,1	4,7	26,1	29,9	6,6	29,3	3,4	**100,0**
Gauteng	Number	80	153	1 700	1 812	280	570	46	**4 641**
	Per cent	1,7	3,3	36,6	39,0	6,0	12,3	1,0	**100,0**
Mpumalanga	Number	*	186	164	275	70	247	14	**954**
	Per cent	*	19,5	17,2	28,8	7,3	25,9	1,4	**100,0**
Limpopo	Number	*	79	245	273	73	384	14	**1 068**
	Per cent	*	7,4	22,9	25,6	6,8	35,9	1,3	**100,0**
RSA	**Number**	**151**	**777**	**3 753**	**4 810**	**997**	**2 704**	**159**	**13 350**
	Per cent	**1,1**	**5,8**	**28,1**	**36,0**	**7,5**	**20,3**	**1,2**	**100,0**
Geographic location									
Urban	Number	149	457	3 074	4 225	781	1 516	117	**10 318**
	Per cent	1,4	4,4	29,8	40,9	7,6	14,7	1,1	**100,0**
Rural	Number	*	320	679	585	217	1 187	42	**3 032**
	Per cent	*	10,6	22,4	19,3	7,1	39,2	1,4	**100,0**
Household income quintiles									
Quintile 1 (lowest income quintile)	Number	38	149	822	1 805	254	435	43	**3 546**
	Per cent	1,1	4,2	23,2	50,9	7,2	12,3	1,2	**100,0**
Quintile 2	Number	23	114	578	364	113	624	29	**1 844**
	Per cent	1,2	6,2	31,4	19,7	6,1	33,8	1,5	**100,0**
Quintile 3	Number	27	153	733	314	149	754	38	**2 169**
	Per cent	1,2	7	33,8	14,5	6,9	34,8	1,8	**100,0**
Quintile 4	Number	37	211	919	486	204	590	25	**2 472**
	Per cent	1,5	8,5	37,2	19,6	8,3	23,9	1,0	**100,0**
Quintile 5 (highest income quintile)	Number	26	150	700	1 842	277	301	24	**3 319**
	Per cent	0,8	4,5	21,1	55,5	8,3	9,1	0,7	**100,0**

The totals used to calculate percentages excluded unspecified cases.
The numbers differ from the official employment statistics as a less sophisticated series of questions were used to establish work status.
* Unweighted numbers of 3 and below per cell are too small to provide reliable estimates
Percentages calculated within the mode of travel.

Source: 2020 NHTS

3.1.2 Modal Split for Trips to Places of Education

Table 3.2 indicates the main mode of transport used to travel to an educational institution by province based on the 2020 NHTS.

TABLE 3.2: MAIN MODE OF TRANSPORT USED TO TRAVEL TO EDUCATIONAL INSTITUTION BY PROVINCE BASED ON 2020 NHTS

Mode of travel		Statistics ('000)	Province (per cent within province)									
			WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Public transport	Train	Number	15	3	*	*	2	*	17	*	*	**37**
		Per cent	0,9	0,1	*	*	0,1	*	0,4	*	*	**0,2**
	Bus	Number	101	79	25	29	213	72	284	85	111	**998**
		Per cent	6,3	3,6	7,5	3,2	6,2	6,3	7,1	6,3	5,2	**5,9**
	Taxi	Number	219	328	34	136	454	193	864	184	301	**2 713**
		Per cent	13,7	15,1	10,3	15,2	13,3	16,8	21,6	13,5	14,2	**15,9**
Private transport	Car/truck driver	Number	108	32	4	15	52	15	111	29	15	**382**
		Per cent	6,8	1,5	1,2	1,7	1,5	1,3	2,8	2,1	0,7	**2,2**
	Car/truck passenger	Number	291	242	40	82	571	129	743	100	191	**2 388**
		Per cent	18,2	11,1	12,2	9,1	16,7	11,2	18,6	7,4	9,0	**14,0**
Walking all the way		Number	851	1 475	212	626	2 052	690	1 792	941	1 480	**10 121**
		Per cent	53,3	67,6	64,2	69,9	60,0	60,2	44,8	69,4	69,9	**59,4**
Other		Number	13	23	15	7	74	48	188	17	20	**404**
		Per cent	0,8	1,0	4,5	0,8	2,2	4,1	4,7	1,2	0,9	**2,4**
Total		**Number**	**1 598**	**2 182**	**331**	**896**	**3 419**	**1 146**	**4 000**	**1 355**	**2 117**	**17 044**
		Per cent	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

Unspecified modes of transport were excluded from totals for the calculation of percentages.
* Unweighted numbers of 3 and below per cell are too small to provide reliable estimates.
Percentages calculated within provinces.

It is evident from **Table 5.4** that 'walking all the way' was the primary method used by learners to reach their educational institutions in all nine provinces. Of the 17,0 million learners who attended an educational institution, more than half (about 10,1 million) walked all the way. About 2,7 million learners made use of a taxi to travel to their educational institution.

In Limpopo Province, 'walking all the way' is also the primary method used by learners to reach their educational institution. Of the about 2,1 million learners who attended an educational institution, approximately 70% (about 1,5 million) walked all the way. About 300 000 learners made use of a taxi to travel to their educational institution.

For the compilation of the **MLM-LITP** it was assumed that the MLM has similar patterns than the Limpopo Province.

3.2 Public Transport

3.2.1 Limitations of the current commuter system:

a) Unattractive roadside bus and taxi stops with no shade or shelter.
b) Out of the city, there is often no path access or paved waiting area including full barrier kerbing to protect waiting passengers. Access to the stops is often through drainage ditches.
c) Minibus taxis are supply-driven and not demand-driven. Services are focused on the profitable peak periods.
d) High level of criminal activities associated with public transport facilities.

3.2.2 Intermodal Long-distance Public Transport Terminal

MLM needs a *"Long-distance Intermodal Public Transport Facility"* that will ensure integration between the various modes of public transport, including long-distance buses, long-distance taxis, rail and the local public transport operations.

A detailed study should, however, be conducted to incorporate all modes of transport and the related amenities within a *"Long-distance Intermodal Public Transport Facility"*.

3.2.3 Integrated Public Transport Network

See **Appendix A-2** for detailed information.

3.2.4 Taxi Facilities

The vision statement of transport as stated in the National White Paper indicates that public transport operations and infrastructure should be fully integrated. It is therefore recommended that when providing the public transport facilities, the following should be taken into consideration:

a) Provide multimodal public transport facilities at the primary nodes in MLM.
b) Provide loading and off-loading facilities for public transport at strategic points at secondary and tertiary development nodes in MLM.

3.2.5 Bus Facilities

A total of 4 formal Taxi Rank Facilities and 12 informal Taxi Rank Facilities were registered in MLM, while 1 formal Bus Rank Facility was registered in MLM.

3.2.6 Bus and Taxi Lay-bys along Public Transport Corridors

As part of compiling **Chapter 2** (Transport Register), surveys were conducted to identify existing bus and taxi lay-bys on public transport routes in MLM.

Surveys included the different components of lay-bys including shelters, paving and kerbing. Based on the information collected, existing lay-bys were divided into the following categories:

a) Lay-bys with paving, kerbing and shelters:

These lay-bys are complete and do not require any additional infrastructure such as kerbing or paving.

b) Lay-bys with paving but without shelters:

In this case, the lay-by includes paving and kerbing, but no shelter is provided. The cost of a shelter is inexpensive compared with the cost of the lay-by. This implies that an improved facility, with shelter against the elements, can be provided at a relatively small cost.

c) Lay-bys without paving or shelters:

In this case, the lay-by includes paving and kerbing, but no shelter is provided. The cost of a shelter is inexpensive compared with the cost of the lay-by. This implies that an improved facility, with shelter against the elements, can be provided at a relatively small cost.

Table A-8.1 of Appendix A-8 indicates lay-bys that need to be upgraded by providing shelters and/or paving as well as locations where new lay-bys are required.

It is important to note that most of the corridor routes and roads in rural areas are owned by SANRAL and RAL respectively, therefore it requires that MLM should liaise with the relevant road authorities for the implementation and/or upgrading of existing facilities.

3.3 Measures to Promote Public Transport

In 2007, the National Department of Transport developed a Public Transport Strategy aimed at improving and thereby promoting public transport in South African cities. This strategy is aimed at promoting public transport by improving services rather than trying to penalise private transport.

A main feature of the strategy is to ensure the development of IRPTNs for the larger cities. The Public Transport Strategy identified IRPTNs as the best option to ensure sustainable, equitable and uncongested mobility in liveable cities and districts.

MLM is not one of the identified towns, but it is, however, important that the MDM-IPTN should be incorporated.

MLM is the municipal sphere of government responsible for municipal transport functions including municipal public transport in their areas of jurisdiction. Therefore, MLM should

appropriately plan, implement and manage modally integrated public transport networks and travel corridors. The following categories are relevant:

a) Public Transport Regulation and Monitoring that includes:

   i) Public Transport Regulation and Compliance.
   ii) Taxi Industry Transition.

b) Roads and Stormwater.
c) Public Transport Operations.

3.4 The needs of Learners and Persons with Special Needs

3.4.1 Learner Transport

Pedestrian infrastructure provision adjacent schools are generally extremely poor. Students are not protected from dangerous car behaviour (drop off/pick up) adjacent to school entrances.

Infrastructure does not guide or restrict car movement safely. Kerbing does not protect students. Cars are permitted to drive and park on the verge resulting in conflict with pedestrians and cyclists.

3.4.2 Scholar Patrols

As laid down by the Road Traffic Act (Act 93 of 1996), Section 57.5, scholars and students (learners) can be organised into patrols (known as scholar patrols) to display a stop sign in the prescribed manner (SADCRTSM 11/97, Section 2.8) so that the safety of pedestrians crossing a public street or road can be ensured. It is a function of provinces to support the establishment of scholar patrols where there is a need and where it is demanded by circumstances.

The MDM and Limpopo Province Community Safety Forums need to be incorporated as part of the road safety initiative related to scholar patrol activities and need to drive the process related to road safety at schools.

Where needed, and when requested by school principals and/or recommended by traffic authorities, aid and assistance should be given to assist with the functioning of scholar patrols.

The relevant authority should arrange for insurance cover against collisions and claims resulting from events occurring during the legal functioning of scholar patrols. Equipment should be provided by relevant authorities and guidelines for the implementation and functioning of scholar patrols. The Scholar Patrol Programme benefits the school, the community and the student safety patrollers. The programme provides quality training and recognition for student safety patrollers' efforts.

3.4.3 Transport Users with Special Needs (Universal Access Guidelines Developed)

It is important that the transport environment, including public transport services and transport infrastructure are accessible for people with special needs, which is typically referred to as “universal access design.”

The National Land Transport Act 5 of 2009 and Amended National Land Transport Act 23 of 2023, requires that people with disabilities are provided for in public transport projects as passengers, along with a wider group of other passengers with special categories of need. The term Passenger with Special Categories of Need (PWSCN) is often used interchangeably with Special Needs Passengers (SNP). However, PWSCN is the term referenced in legislative documents of the Department of Transport.

Some concerns include related to transport for users with special needs are:

a) Limited infrastructure provision.
b) Public transport vehicles i.e. road based MBT’s or buses are not specifically tailored to accommodate universal access.
c) Some intersections have dropped kerbs and tactile paving, but not all intersections in MLM have this function.
d) Access into buildings is sometimes equipped with ramps for wheelchairs and prams.

It is recommended that MLM should develop a Universal Design Access Plan (UDAP).

The Principles of Universal Design were developed through The Centre for Universal Design, North Carolina State. There are seven principles, and they include:

a) Equitable use.
b) Flexibility in use.
c) Simple and intuitive use.
d) Perceptible information.
e) Tolerance for error.
f) Low physical effort.
g) Size and space for approach and use.

The Department of Transport in South Africa recognises the following groups as universal access passengers or people with categories of special needs:

a) **People with disabilities**: defined in the Act as people with a physical, sensory or mental disability, which may be permanent or temporary.
b) **The aged**: or elderly people. People over the age of 55 usually fall into this category.
c) **Pregnant women**: usually taken as women in their last three months of pregnancy.
d) **Young children**: this is usually defined as children between the ages of 0-14.
e) **Those who are limited in their movements by children**: men and women accompanying young children.

f) **Signage passengers**: people who are unable to read or who are unable to understand the language used on the signage. Tourists are also included as signage passengers.
g) **Female passengers:** whilst safety and security affect all passenger groups and both genders, it should be noted that female passengers (together with people with disabilities) are particularly at risk of crime and abuse.
h) **Load-carrying passengers**: people carrying bags, luggage or goods of a size that means that they benefit from accessibility features. This is important to people on low incomes in South Africa. People travelling with bicycles are generally also included in this category.

The MLM-NMT Master Plan should incorporate the details of the UDAP.

3.5 Non-motorised Measures Transport (NMT)

NMT planning is governed by the National Land Transport Act (NLTA) of 2009 and Amended NLTA of 2023, specifically Section 11, which directs the municipal sphere of government to, among others, develop appropriate methods of transport that cater for the broader community in a sustainable and environmentally friendly manner.

Based on the Provincial Land Transport Framework of Limpopo (PLTF) – 2015 to 2019, **Chapter 7,** the following were recommended:

a) DoT, education and district municipalities must develop NMT plans.
b) Specific needs of learners must be addressed, where pedestrian facilities, bicycles and animal-drawn vehicles are appropriate.
c) Local municipalities must encourage safe bicycle parking at schools, shopping centres and workplaces.
d) Bicycle lanes and paths are the main infrastructure element.
e) Local municipalities must prepare a plan to encourage bicycles and provide NMT infrastructure.

The Limpopo Province is promoting cycling through a national government initiative from the NDoT - the Shova Kalula programme. The project subsidises bicycles and safety gear to learners in rural areas. It recommends that local municipalities must prepare plans to encourage the use of bicycles and provide the necessary infrastructure.

Six elements that frame the overall problem statements/needs that disbenefit the MLM are:

a) **Element 1,** Socio-economic upliftment.

Problem Statement:

Poverty remains a great challenge in MLM with most of the population living in a rural setting. The MLM population is still characterised by high unemployment, low education levels and low income. For most of the population, the living conditions remain poor, with a lack of basic services (Stats SA, 2011).

Objective:

MLM-NMT can play a role in improving the living conditions of the local population through partnering with local SMMEs who could benefit from NMT related projects. Furthermore, given the labour-intensive nature of the construction of NMT infrastructure, an opportunity exists to reduce the unemployment rate in MLM.

b) **Element 2,** Enhancing accessibility.

Problem Statement:

Universal access for the road network remains a challenge for communities that cannot afford public transport. Furthermore, the roads were mainly designed with the motorist in mind. This policy aims to reduce disparities in socio-economic conditions between communities by making the MLM accessible to all. To achieve this, it will be necessary to improve the transport system in MLM. The MLM-NMT, as a mode of transport, can play an important role by enabling communities with limited public transport access to cycle to the nearest public transport facility. NMT can also help to increase disposable income for poor households by reducing the need to use public transport for short distances.

Objective:

NMT, being a low-cost mode, can be an effective tool for targeting the poor and improving their livelihood.

c) **Element 3,** Ensuring the protection of the environment.

Problem Statement:

Human activities impact on the environment and often overload and destroy it. Emissions have a major impact on the environment especially on-air quality and climate change. Society has a collective responsibility to safeguard the environment for future generations. This requires that the transport systems provided by MLM should be sustainable and environmentally sensitive.

Objective:

NMT is essentially an emission-free transport mode which is obviously advantageous to the environment. The promotion and growth of NMT will have a directly positive effect on the environment.

d) **Element 4,** Promoting safer living environments.

Problem Statement:

The safety of users is crucial for the successful implementation of NMT in MLM. Currently, NMT facilities do not always provide a safe environment for pedestrians and cyclists. As an example, the position of road signs in the NMT facilities poses a safety risk for the users.

Objective:

Safety can be achieved through care environmental design which discourages the activities of criminals and ensures integration between motor vehicles and NMT. Safety must be linked to awareness campaigns to ensure that the city's population appreciates the role of NMT.

e) **Element 5,** Promotion of integration.

Problem Statement:

There is a lack of integration in the planning and positioning of public transport infrastructure.

Objective:

The transport systems that MLM provides must be integrated. This will ensure that the user experience is seamless, and the quality of life is improved. For this system to function optimally, there is a need for sufficient integration of NMT with all other modes of transport.

f) **Element 6,** Enhancing the quality of life.

Problem Statement:

Strong and well-functioning people and communities are the building blocks for a sustainable society. Currently, MLM is lacking in these areas.

Objective:

NMT acts as a direct contributor to community building and enhanced quality of life through the improved access it provides. It also allows communities to better share public spaces thus promoting integration.

MLM's proposed measures to promote walking and cycling are set out in **Table 3.3** below. These include measures to encourage residents to walk or cycle instead of using motorised transport.

TABLE 3.3: MLM MEASURES TO PROMOTE MLM - NMT		
No.	**Objectives**	**Measures**
1.	Safety	a) Separation between motorists and NMT facilities. b) Sidewalks should be separated from the road. c) Sidewalks should be wide enough to accommodate pedestrians, cyclists and other modes of NMT. d) To inform motorists of NMT activities, board signs should be erected along the routes. e) Traffic calming measures should be incorporated where necessary, e.g., zebra crossings, pelicans, toucans, midblock crossings. f) Law enforcement to ensure NMT and motorists adhere to the law. g) NMT facilities should ensure safety of the user both by day and night. h) Safety of pedestrians at schools. i) Activities on footpaths, such as street vendors, must be controlled properly to secure pedestrian safety. j) Facilities should be made available for cyclists to secure their bicycles and accessories against theft.
2.	Continuity	a) Ensure that MLM-NMT facilities are continuous and do not end abruptly. b) Continuity of facilities is very important to also attract users of the other modes of transport. c) Routes should be coherent and continuous networks linking all origins and destination points for the users rather than ad-hoc facilities that end abruptly.
3.	Comfort	a) Construct dropped kerbs at intersections of MLM roads to facilitate smooth crossings by people such as the disabled and mothers with prams. b) Sidewalk to be wide enough with no services such as lampposts to obstruct wheelchairs along the route. c) Facilities should ensure the smooth, quick and comfortable flow of NMT without excessive gradients or uneven surfacing.
4.	Attractiveness	a) Design to be done by local consulting experts and local community (potential user) should be involved in the construction. b) Street furniture such as seats, trees for shade, public phones, etc. should be provided for the user. c) Cycling to school should be promoted by assisting with the procurement of cycles and accessories for scholars.

TABLE 3.3: MLM MEASURES TO PROMOTE MLM - NMT		
No.	**Objectives**	**Measures**
5.	Directness	a) Facilities should be provided in line with existing desire lines, usually the shortest and most direct route to the destination. b) Direct linkages should exist between habitual areas and other areas of interest such as public transport facilities. c) Facilities should avoid significant detours to mitigate the user ignoring this.

MLM does not have a MLM - NMT Master Plan and therefore it is recommended that MLM should develop such. The design of the NMT facilities typically contains the following steps:

a) Identification of roads requiring NMT.
b) Survey of roads.
c) Detailed design.
d) Compilation of multi-year (3-year) tenders in accordance with the MLM MTREF.
e) Appointment of a suitable contractor for the relevant construction period.
f) Construction of facilities based on available budget for each year.
g) Maintenance and monitoring for the relevant construction period.
h) Close out and report.

MLM is beset with many challenges which include unemployment, socio-economic issues and the effects of Covid-19. NMT should not be ignored or treated nonchalantly; strong and well-functioning and well-being people and communities are the building blocks for a sustainable society. Effective NMT planning will go a long way in assisting MLM residents and communities to function more efficiently, sustainably and happily.

3.5.1 Public Parking

Public parking should be provided and secured and should be short distances from either bus stops or commercial activities as illustrated in **Figure 3.2**.

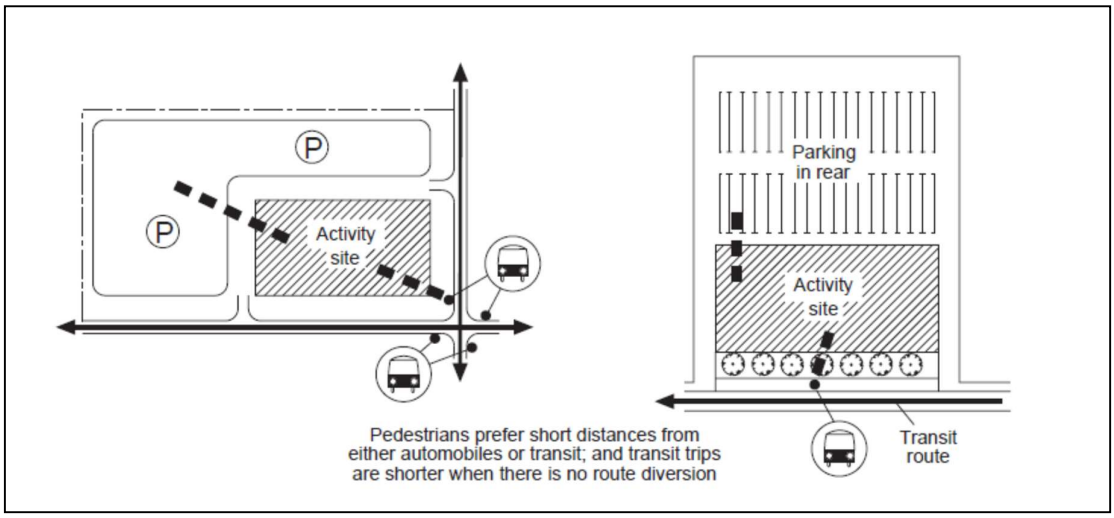


FIGURE 3.2: EXAMPLE OF SECURED SHORT DISTANCES FROM EITHER BUS STOPS OR COMMERCIAL ACTIVITIES

3.6 Private Transport

In this context, private transport refers to trips by light vehicles. It includes trips to work and school as well as for business, social, deliveries or any other trips where light vehicles are used. Any vehicle not counted as a bus, taxi or heavy vehicle falls in this category. In terms of road congestion, private transport contributes the most to road congestion as indicated by **Table 3.4** which was developed as a study case.

TABLE 3.4: ROAD SPACE REQUIRED FOR DIFFERENT TRANSPORT MODES AS DETERMINED AS PART OF A STUDY CASE

Vehicle Type	Vehicle Length	Passengers per Vehicle	Road Space per Vehicle (m) (at 60 km/h with 2-sec gaps)	Road Space per Passenger (m) (at 60 km/h with 2-sec gaps)	Ratio of Road Space Required per Passenger
Bus	15	60	48	0,8	1
Minibus taxi	6	14	39	2,8	3,5
Car	5	3	38	12,7	15,9

The table indicates that the road space taken up by private car passengers is almost 16 times more than the road space taken up by bus passengers. Taxi passengers take up 3,5 times more road space than bus passengers. This confirms the inefficiency of private vehicles compared to buses and taxis. The consequence of the above is that private vehicles contribute more to traffic congestion than public transport modes such as taxis and buses. The picture below practically illustrates the difference in road space taken up by the same number of people travelling by car, foot and bus.

Public transport should be promoted as this is the best long-term solution to deal with road congestion and the ever-increasing demand for more roads. MLM is in a favourable position compared to many other South African cities, as a high percentage of commuters already use public transport. The challenge is, however, to improve public transport services to such a degree that even those who can afford to travel by private car will also use public transport.

Public transport and NMT are high priority in terms of the Transport Assessment Needs to be supported to ensure economic growth in future in MLM.

3.7 Travel Demand Estimation

The travel demand estimations should be conducted by collecting continuously information by means of the following types of surveys for the various modes of transport (light vehicles, taxis, buses, heavy vehicles):

a) Vehicle occupation surveys at strategic points.
b) Vehicle traffic counts.
c) Household surveys.
d) Route utilisation surveys.
e) Rank utilisation surveys.
f) Random surveys to determine the satisfaction and needs of operators and passengers.
g) Constantly compare transport information with economic and land use data.

The main purpose of travel demand estimates is to determine if there is an under or oversupply of public transport at any point and time.

3.8 Freight Transport

The movement of freight through heavy road vehicles, coupled with the tendency to overload, results in deteriorating road infrastructure. This challenge is exacerbated by the lack of road maintenance, which leaves the roads unattended until they deteriorate even further. It is therefore important to find ways to address these challenges while maximising the economic potential of freight in MLM. The following key projects have been identified for this balance and have been detailed in **Appendix C**:

a) The development of truck inn/s in MLM.
b) Implementation of overload control strategy for MLM.

3.9 Transport and Technology

The rise in fuel prices is having an adverse impact on transport costs of the country with subsequent negative impacts on the economy. This problem and other environmental considerations have resulted in ongoing technological investigations to reduce the dependence on conventional fuels such as gasoline. The changes in technology may have a significant impact on the vehicle types within a city as well as the emissions associated with

the vehicle mix. This issue does, however, create opportunities for interventions in public transport, even at a local scale such as MLM.

A Road Network Management System (RNMS) should be developed for MDM, that include NMT and should be aligned and integrated with the RAL PMS and the MLM roads.

The RNMS potentially consists of the following modules:

a) Road Network Module

i) Develop a coding system for road links.
ii) Identify a suitable road classification system.
iii) Collection of existing road network data.
iv) Identify proposed future road links.

b) Traffic Management Module

i) Establish details of traffic data required.
ii) Collect available traffic data.
iii) Populate the database with traffic information.
iv) Analyse traffic data.
v) Establish an annual traffic counting programme.

c) Pavement Management Module

i) Identify a suitable pavement condition classification system.
ii) Assess existing pavement conditions.
iii) Populate the database with pavement condition data.
iv) Analyse pavement condition data.

d) Road Sign Module

i) Prepare an inventory of existing road traffic signs.
ii) Assess the condition of existing road signs.
iii) Populate the database with traffic sign data.

e) Geographic Information System (GIS) Module

i) Prepare the mapping of the existing road network.
ii) Link road classification database to maps.
iii) Link traffic information database to maps.
iv) Link pavement condition database to maps.
v) Link road sign database to maps.

f) Financial Module

i) Analyse available data.
ii) Identify problem areas in the road network.
iii) Prioritise road improvements.
iv) Prepare an annual budget for road maintenance.

The above modules are not exhaustive, and additional modules could be added if necessary.

3.10 Transport infrastructure

MLM Transport Infrastructure Strategy (TIS) should be developed to deal with the development and maintenance of all transport infrastructure, including the following:

a) Major roads.
b) Public Transport (PT) facilities.
c) Freight corridor measures.
d) Non-motorised Transport (NMT) infrastructure.

3.11 Findings and Conclusion

In conclusion, the investigation into the transport needs assessment for MLM has had the following important findings:

a) Walking: Walking (35.9% in Limpopo Province) is the most important mode of transport for work-related trips in MLM. This finding underlines the importance of proper NMT planning in MLM. The dominance of this mode is highlighted when the educational trips are considered. Walking accounts for 69,9% of school trips in Limpopo Province.
b) Public Transport: When combining taxis and bus trips, 30.3% of work-related trips are public transport trips. Public transport received significant attention with the current IRPTS projects done and what is still underway. **Chapter 6** provides a more detailed discussion on the public transport operations strategy.
c) Integration of NMT and PT Planning: Integration between the said modes is required.
d) Hybrid/Electric Technology: This is a relatively new technology for South Africa, and the initial start-up cost is very high although this technology provides an opportunity for future PT interventions.

From **Table 3.1** it is also possible to note that for Limpopo Province, the dominant transport mode was walking (35,9%), Private cars with the workers being the driver is 25.6%, taxis account to 22,9% and buses account to 7,4%.