



LIMPOPO

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**DEPARTMENT OF
ROADS & TRANSPORT**

Travel Demand Management Study

Business Plan: Parking Study

Capricorn District Municipality

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1. Introduction

The Department of Roads and Transport: Limpopo Province has undertaken an overall Travel Demand Management (TDM) Study covering Mopani and Capricorn District Municipalities. This business plan focuses on the Capricorn District Municipality. As described in the District Municipality's TDM report, five pilot programmes were listed in which feasible pilot projects could be identified for short-term implementation. The TDM programmes identified for further investigation included the following:

- Maintain a Road Network Management System (RNMS)
- Undertake a public transport demand study
- Undertake NMT Planning
- **Conduct a parking study in Polokwane**

This document covers the business plan for the implementation and promotion of a parking study in Polokwane. Currently parking in Polokwane is not optimal with parking meters out of order and parked vehicles blocking lanes in the congested areas. These concerns were identified during the TDM Study. Therefore it is proposed to conduct a parking study that will determine whether sufficient on-street parking facilities are available, and if not will propose other options and will also make recommendations about appropriate ways to collect parking fares. This business plan fits into the larger TDM Policy of the District Municipality as well as all the other relevant frameworks and policies.

2. Parking Background

The principles of providing parking in towns and cities have developed from a car-centric approach to transport planning. South African parking standards derived from USA practices, and aimed to ensure that parking should always be sufficient to accommodate the likely maximum demand. Minimum parking standards therefore typically result in surplus bays which, as it happened, resulted in increased demand for car travel. The oversupply of parking resulted in motorists viewing parking as a right.

The supply of parking not only encourages the use and proliferation of cars, but also takes up valuable commercial and retail space, especially in town centres and central business districts, that attract large numbers of people. Even more importantly, the presence of cars and space taken up by roads and parking, detract from the quality and attractiveness of human scaled spaces. (Jeffares and Green, Parking Management Strategy, 2009)

The impact of growing town centres is congestion that either requires more road and parking space or else lead to decentralisation. Decentralisation typically leads to a deterioration of the original town centre and a loss of the historic and cultural value that is encapsulated in these spaces. It further results in poorer utilisation of the infrastructure (road space) provided over time, and a need to provide new roads to the newly decentralised nodes. As the new roads serve different zones it is not always acknowledged to be duplicating the function of existing infrastructure, for instance roads.

New infrastructure provision should therefore only be considered once existing infrastructure is optimally utilised. Traditionally road utilisation has been measured in terms of traffic flow with

the car as unit, and not in the flow of persons into a specific area. Justifying new roads to decentralised zones on the basis of expected traffic flows assumes that all users of these areas have access to cars and excludes those members of a community that do not. Decentralisation weakens the growth potential of town centres, thereby diluting the viability of public transport services.

In summary, the result is that of social exclusion as many business and retail opportunities are only accessible to private car users, while those dependent on public transport find it exceedingly difficult to reach such destinations. It further contributes to sprawl of towns with the reversed effect of losing opportunities for densification, which is a prime land use and transport policy at all levels of government in South Africa.

This parking study should describe aspects of a parking study for Polokwane and proposes strategies to manage parking in a manner that will support the sustainable growth of the town.

3. Strategic Planning Context

The South African Parking Standards was developed for the Department of Transport in 1985 (Jeffares and Green, Parking Management Strategy, 2009) and to this day serves as the only official national guideline for the provision of parking in South Africa. It discusses layout and geometric attributes of different parking scenarios and provides the minimum parking standards that forms the basis of most development in the country. There is no official nationally documented parking policy in South Africa. Parking policy is reflected in the zoning regulations of the metropolitan, and many local, authorities throughout the country.

In the 20 years since, the political arena in the country experienced dramatic changes, economic growth is at its highest level in decades, technology advances at an unknown rate and globalisation increasingly changes perspectives on issues like global warming and energy conservation. These factors set the scene within a new planning philosophy that has developed for urban spatial and transportation planning. South Africa has embraced the concepts of sustainable development that requires more efficient transportation systems that would serve higher density and mixed use urban forms (Jeffares and Green, Parking Management Strategy, 2009).

More recently, Metropolitan Authorities address parking requirements as part of their Integrated Development Plans (IDP's). The commonly applied policy is one of providing a minimum number of parking bays that would be sufficient to avoid the congestion problems associated with an undersupply.

It is, however, considered prudent to establish what the parking policy should be to support other policies and legislative frameworks that affects or are affected by parking. Because parking plays an integral role in the interface between urban transportation and land use, the legislation and policies that govern these elements should form the basis for a parking policy.

3.1 Policies and Legislation Relating to Parking

Land use and transport policy has been revised since 1994 to redress the legacy of the apartheid era. These policies are studied for guidance on how to approach the provision of parking in South Africa. Extracts from relevant acts and policy documents are discussed below.

National Land Transport Transition Act (Act No 22 of 2000)

General principles for transport planning in the National Land Transport Transition Act (NLTTA) and its relationship with land development are listed in paragraph 18 of the act. The clauses that have an influence on parking policy and standards are highlighted below.

18. (1) Land transport planning must be integrated with the land development process
...
- (3) (b) ...**discourage urban sprawl** where public transport services are inadequate.
- (3) (d) give **higher priority to public transport** by ensuring the provision of adequate public transport services and applying travel demand management measures to discourage private transport.
- (3) (f) minimise adverse impact on the environment.
- (6) (f) integration of transport and land use planning within the context of the Development Facilitation Act, 1995 (Act No 67 of 1995), or any other similar provincial law.

Development Facilitation Act (Act No 67 of 1995)

The following clauses from the Development Facilitation Act (DFA) (*Act No 67 of 1995*) are relevant for transport and land development:

- (3) The DFA applies to urban and rural development and should **facilitate the development of, *inter alia*, existing settlements.**
- (3) (c) Policy, administrative practice and laws should promote efficient and integrated land development, in that they:
- iii) promote the availability of residential and employment opportunities in close proximity to or integrated with each other;
 - iv) optimise the use of **existing resources including** ... bulk infrastructure, roads, transportation and social facilities;
 - v) promote a diverse combination of land uses...
 - vi) **discourage the phenomenon of “urban sprawl”** in urban areas and contribute to the development of more compact towns and cities;
- (3) (l) A competent authority at national, provincial and local government level should co-ordinate the interests of various sectors involved in or affected by land development so as to minimise conflicting demand on scarce resources.

White Paper for Transport in South Africa (DoT, 1996)

The vision for South African transport is of a system which will: *“Provide safe, reliable, effective, efficient and fully integrated transport operations and infrastructure which will best meet the needs of freight and passenger customer at improving levels of service and cost in a fashion which supports government strategies for economic and social development whilst being environmentally and economically sustainable”*

Some of the Strategic Objectives listed in the document that has either a direct or indirect influence on parking policy are as follows:

- To promote the use of public transport over private car travel, with the goal of achieving a ratio of 80:20 between public transport and private car usage;

- The effective functioning of cities and industrial areas must be enhanced through integrated planning of land use, transport infrastructure, transport operations and bulk services;
- Development priority will be given to **infilling, densification**, mixed land use and the promotion of development corridors and nodes;
- **Containment of urban sprawl and sub-urbanisation** beyond the urban limits will be addressed through provincial spatial development plans;
- **Unrestricted** car usage and **subsidised car parking** will be contained through the application of policy instruments which could include **strict parking policies**, access restrictions for private cars, higher licence fees, road pricing or area licensing. **Restraint on private car usage will however not be implemented independently of improvements in the quality of public transport.**

Moving South Africa: The Action Agenda (DoT, 1998)

This document shows that the number of cars in South Africa increased by 72% in the 24 year period between 1972 and 1996. It also quotes forecasts that it will increase by another 64% in the 20 year period to 2020. The four factors that drive this trend are listed as:

- Low car operating costs;
- Land use patterns;
- Poor public transport alternatives, and
- Infrastructure investment in roads.

It also states that **a variety of subsidies for parking and car ownership** warp the natural economics of the decision to own and use a car. One of the strategic actions identified to reach the vision for transport in the “*Optimisation of modal economics and service mix to meet customer needs*”. This strategy includes implementing **tough road space management and car restrictions** to improve the performance of public transport, i.e. to **break the natural transport cycle of increased car use and poorer public transport services**.

Summary of Policies and Legislation

The clear policy directive from all the above documents, with regard to land use and transport planning, is to promote the efficiency of urban development. The mechanisms proposed include incentives and requirements for higher density urban form supported by enhanced public transport systems, together with disincentives for use of private cars. Significantly, it specifically includes containing subsidised car parking.

3.2 Parking in Practice

Current Practice of Providing Parking in South Africa

Higher income South Africans commute in private vehicles with occupancy rates ranging between 1.5 and 2.0 persons per vehicle. Parking is typically provided at a rate that exceeds this demand to avoid prolonged queuing on city streets, the congestion in which this results, as well as vehicles encroaching onto nearby properties.

Table 3.1 shows the comparative rates per square meter for typical rentals of parking, office and retail space. From the table it is clear that parking is rented out at a much lower rate than office and retail space. Office space is cheaper in less popular areas, which are generally associated with ample parking opportunities. The lowest office rentals would therefore not be

associated with the higher parking rentals.

Table 3.1: Typical Rental Rates for Different Land Uses (Jeffares and Green, Parking Management Strategy, 2009)

Land Use	R / month	R / m ²
Office Space – CBD	-	130
Office space - Other Node	-	60
Retail Space Large	-	100
Retail Space Small	-	350
CBD Parking – Low	500	20
CBD Parking – High	800	32
Retail Parking – Low	35	1.40
Retail Parking – High	600	24

It is seen in **Table 3.1** that office space in business districts cost three to five times that of parking in the same areas. In retail areas, this ratio exceeds 15 times. The low price of parking has implications for land use development, private car trip generation and public transport. These impacts are discussed below.

Implications of Parking Provision on Land Use

Off-street parking in business districts is provided either as stand-alone parking garages or as separate floors in office buildings. The balance between supply and demand results in the narrow band of R500 to R800 at which parking can be rented out (Jeffares and Green, Parking Management Strategy, 2009).

If stand-alone parking garages were converted into office blocks, it would be rented out at about four times the parking rate. In the same way, converting the parking floors of office buildings to office space would result in a four times higher turnover of that space. The less than productive use of land will affect not only development, but also the end-user of business (Jeffares and Green, Parking Management Strategy, 2009).

In the absence of suitable public transport, parking can be seen as an important enough land use that it should be subsidised by the users of other land uses. One could also conclude that, should an efficient public transport system exist, economic forces would lead to the conversion of some parking space into more profitable office or retail space.

Implications of Subsidised Parking for Private Car Users

When calculating the cost of commuting by car, most users do not consider the full cost of the decision. Most drivers equate the cost of the trip to the fuel cost, and sometimes also a part of the maintenance cost. Likewise, when comparing this mode to rail, the cost of the cumulative vehicle trips does not take the cost of the road infrastructure into consideration. Drivers do, however, typically include the cost of parking into the equation when calculating the cost of their commuting trip.

According to Jeffares and Green's Parking Management Strategy (2009) the market is not

willing to pay more than about R800 for parking per month of full day parking. This would be true in a system where higher prices would push commuters to other modes. However, due to the poor safety record and unreliability of the public transport system, most commuters are captive to the use of a private car.

The ceiling on monthly parking charges, given the dependency of motorists, alludes to an over-supply in parking spaces. This supports the notion that parking is supplied to meet the demand of a car dependant society.

Implications of Subsidised Parking for Public Transport

Modal choice is typically based on the cost, speed, choice and convenience of available modes. The level of service provided by a public transport operator depends on the level of patronage. A fare income from a minimum number of passengers is necessary to cover the operating cost of a basic service. A basic service would be one that offers limited choice and convenience. Income from additional passengers could be used to improve the level of service (LOS).

A service with a higher level of service may attract more passengers, which would pay for the improved LOS. An increase in passenger numbers would therefore only follow an improvement in service, similar to any other commodity.

Subsidised parking makes it more difficult for public transport operators to compete with private car as a mode as the free-market principle of supply and demand is no longer balanced. However, not only do public transport passengers pay relatively more for their transport, they also contribute to the subsidising of parking for private car users.

Parking in an office block is paid for by the rental of the office space. Rental is a cost to the tenant, who has to balance this with other costs like salaries in order to be profitable, or through increased margins on sales. Customers and staff, making use of public transport, pay the same amount for goods and services as those arriving by private car. However, only those individuals arriving by car get the benefit of the subsidised parking.

Summary of Parking in Practice

Legislation and policies that govern the development and control of transport and land use in South Africa unambiguously call for higher density urban form with mixed land use. High density mixed land use cities needs the support of efficient, high occupancy public transport. At the same time it provides the ridership necessary to sustain an efficient public transport system.

Both land use and transport policies are clear that public transport should be promoted above private transport to the extent that unrestricted car travel is contained. One of the strategies to achieve the shift from private to public transport in support of the policies and legislation is the implementation of strict parking policies.

Current practice of applying parking standards, however, favours the private car as a mode above public transport. These standards can be read to imply that the following principles hold:

- Maximum demand shall be met, regardless of the cost thereof;
- Parking demand is only dependent on the needs of private car drivers;
- Parking demand is independent of any other land use and transportation factors;

By continuing the current practice of providing minimum number of parking bays for all developments, the use of the private car is promoted above public transport. This results in higher demand for road infrastructure which eventually leads to urban sprawl, something the policies and legislation for both land use and transport strongly advocates against.

The NLTTA requirement, that urban sprawl be discouraged, is ignored when parking is allowed instead of providing adequate public transport services. The goal is therefore to restrict parking provision to a maximum number per development, while introducing suitable public transport services to meet the travel demand. The strategic and tactical paths to implement this goal are not clear and warrant further research and analysis.

It is, however, critical that the parking strategy deployed by the Polokwane Municipality ensures development takes place in support of the policy directives. There can therefore no longer be a “business as usual” approach that result in decentralisation and the promotion of car space above public transport and human scale space. The new thinking that is required will ensure transport planning focuses on person trips, not vehicle trips.

4. Data Collection and Analysis

4.1 Parking Provision

Parking in the town centre of Polokwane is provided by a mixture of on- and off-street public and private parking areas. It is proposed to divide the town of Polokwane into zones to describe the parking provision. The study area will have to include the whole business centre. The exact boundaries to be determined at a later stage. Surveyors will then be required to count all the bays including on- and off-street parking facilities and to indicate occupation of the bays as part of the survey. These surveys will have to be conducted at appropriate times, i.e. when it is expected that the parking bay occupation will be at its highest. By surveying during high-demand periods an accurate estimation of parking needs will be possible. It is proposed to survey for a full day.

The following will need to be surveyed:

- Distinguish between on-street and off-street parking facilities and count both;
- Distinguish between private and public parking bays and count both;
- Record free public parking bays and metered public parking bays;
- Record parking fares;
- Record different types of parking bays i.e.:
 - Motorbike bays
 - Bus bays
 - Disabled bays
 - Minibus taxi bays
 - Loading bays

The off-street parking areas can be surveyed by counting the traffic streams that enter and exit the area. The parking demand is calculated as the difference between the cumulative in and outbound volume. **Figure 4.1** shows an example of such a graph indicating the cumulative in (blue) and outbound (red) volumes. The straight red line indicates the capacity of the facility and the tip of the dotted green line the demand. Therefore in this case the capacity is sufficient to cater for the demand.

When conducting surveys for on-street parking facilities, it is also proposed to do full day

observations. The number of parking movements should be recorded as well as the duration of stay per bay. The duration of stay will give an indication about the nature of the need of the driver, i.e. either short or long duration.

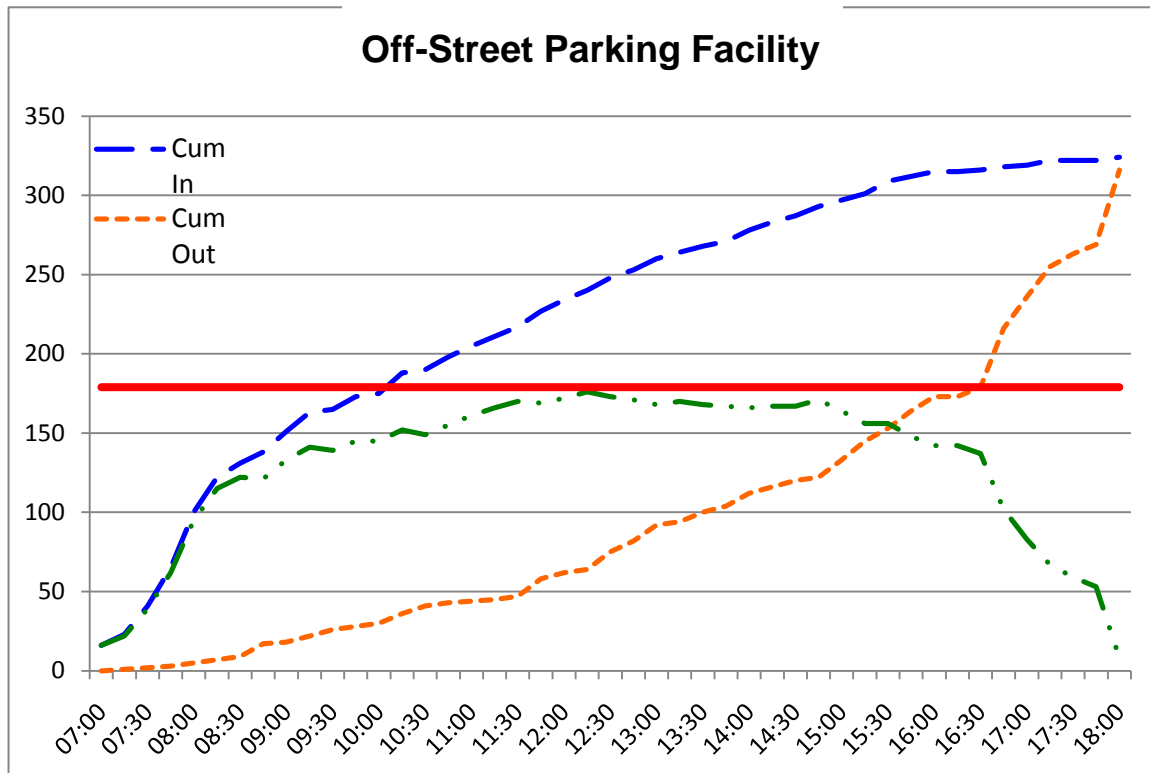


Figure 4.1: Example of Parking Demand

4.2 Parking Fares

After finishing the surveys, the totals of the following will be available:

- Total number of parking bays
- Number of off-street parking bays (public : private split) (free : fare split for public bays);
- Number of on-street parking bays (public : private split) (free : fare split for public bays);
- Typical parking fares

The typical hourly parking fare can then be converted into a monthly parking fare. This monthly parking fare can then be compared with other monthly parking fares in South Africa to determine whether the fares in Polokwane are market related or not. In areas where extreme congestion is experienced or where pedestrian flow is considered paramount, parking fares can be raised to deter private vehicle drivers from parking at those locations (therefore aiding with travel demand management).

It is proposed to use parking wardens with mobile parking meters (as used for example in Tzaneen), thus decreasing unemployment, ensuring change is always available from a convenience point of view and decreasing maintenance problems (parking wardens can pick up immediately when a parking meter is faulty).

4.3 Future Planning

Once the parking requirements have been determined for the town centre, the number of bays

required can be split into short-stay and long-stay parking areas. In the town centre, long-stay parking bays should preferably be minimised. Long-stay parking areas should be provided located at appropriate distances from the town centre. These long-stay parking areas can also be part of park and ride parking areas which can be served by public transport.

However, as with any other municipal service, private developers cannot provide the bulk public transport service, but could contribute to its improvement through development levies and provision of facilities on site. The onus therefore lies with the Municipality to plan and implement (allow implementation) of a basic public transport system to which developers can then be expected to respond in development plans. (See other business plan regarding the public transport demand study)

The following broad objectives are derived from the information and discussion of the Strategic Planning Context described in Section 3:

- Discourage urban sprawl;
- Promote the use of public transport over private car travel;
- Minimise adverse impact on the environment.
- Optimise the use of existing resources, including roads and transportation;
- Give development support to infilling, densification, mixed land use and the promotion of development corridors and nodes;
- Contain unrestricted car usage and subsidised car parking together with provision and improvements in the quality of public transport;
- Break the natural transport cycle of increased car use and poorer public transport services.

4.4 Parking Strategies

A basket of strategies are available to address and influence the provision of parking. Proposals to intervene in parking provision will be discussed in the following strategic areas:

- Off-street parking strategies
- On-street parking strategies
- Parking pricing strategies
- Shared parking strategies
- Residential parking strategies
- Enforcement strategies
- New development (in developed zones) strategies
- Signage strategies
- Monetary Contributions In Lieu of Parking Spaces
- Parking management plan education and communication
- Park and Ride
- Special events parking strategy

5. Team of Professionals

In order to conduct a successful parking study, it is proposed to include certain key positions as part of the professional team. These positions include amongst others the following:

- A project leader with similar experience and a technical background in this particular field;
- A transportation engineer or economist with expertise in parking and transportation planning;
- A survey team who has performed similar surveys in the past or has been trained;
- A technical team member responsible for processing the survey results;
- A public participation officer who can assist with public participation meetings and knows the local conditions
-

6. Timeframe

The parking study's duration will depend on the size of the study area. Duration of approximately three months should be adequate. The context of the study area can influence the duration of the parking study, for instance in a large study area it might take more time to travel to far-off destinations. An example of a parking study's project schedule is indicated in Figure 6.1.

Parking Study in Polokwane	Month 1				Month 2				Month 3			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Arrange parking surveys												
Conduct parking surveys												
Analyse survey results												
Write report												

Figure 6.1: Project Schedule

7. Budget

It is difficult to give an indication of the budget that will be required for a parking study in a town like Polokwane. Past experience indicated budgets ranging between R400 000 and R600 000 in South Africa.

8. References

- Jeffares and Green, Parking Management Strategy, Stellenbosch Municipality, 2009.