

HEAVY VEHICLE OVERLOAD CONTROL IN THE CITY OF TSHWANE

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Abstract

Overloaded heavy vehicles decrease the life span of the road structure with added costs for maintenance and rehabilitation of the road pavement. The management and protection of the road network is necessary, while maintaining the economic base of the freight industry. While hauliers profit from weak law enforcement, overloaded vehicles are damaging roads, the annual road budget in real terms is diminishing and the condition of roads is deteriorating. The premature deterioration of infrastructure inevitably compromises road safety, and adds to the high fatality rate on South African roads. As this continues, the long-term consequences are serious and its impact on the economy is the irony.

Pavement Management Systems data for the City of Tshwane revealed significant deterioration of the road infrastructure, considerably at the road freight generators such as industrial areas. In 1998, the pre-feasibility study on the Strategy of Freight Transport Impact Management in the Greater Pretoria Metropolitan Council Area GPMC (now Tshwane Metropolitan Municipality) was completed. Twenty-two sites were identified to function as heavy vehicle overloading control points. In 1999 a pre-feasibility study on the Construction and Operation of Truck Control Stations in the GPMC Area on a Public Private Partnership basis was completed.

It was initially intended for the feasibility and implementation phases to be carried out on a public-private partnership basis. However, the Municipal Infrastructure Investment Unit advised that without the feasibility study the project was not financially viable.

The paper discusses the way forward which includes the administration of the feasibility planning, and a strategy to optimise the existing infrastructure and resources. The paper then describes the procurement procedure as stipulated in the *Procedural Guidelines for Implementation and Processing of Municipal Service Partnerships for the GPMC*.

1. Introduction

The Moving South Africa (South African transport strategy leading to 2020) study addressed freight transportation, amongst other transportation subjects. The relevant strategies include building density in the transport system through focusing freight flows in select corridors and ensuring sufficient reinvestment to maintain quality infrastructure and operations.

In 1998, a pre-feasibility study, *Strategy of Freight Transport Impact Management in the Greater Pretoria Metropolitan Area (now Tshwane Metropolitan Municipality)* was completed. One of the options to implement an overload control strategy was through a Municipal Service Partnership (MSP). Therefore, in 1999 a feasibility study on the construction and operation of truck control stations in the Greater Pretoria Metropolitan area on a MSP basis, including the development of a MSP policy for transportation infrastructure and services was completed. The reports included:

- The status quo on road and rail freight in the Greater Pretoria area.
- The adverse effects of overloaded heavy vehicles on the road pavement.
- A Municipal Service Partnership (a derivative of Public Private Partnerships) policy and procedural guideline.
- The economic feasibility of heavy vehicle overloading control in conjunction with an Intelligent Transport System (ITS).

A discussion document, *Overload Control on a Municipal Services Partnership Basis: A Pre-feasibility Study* was completed in September 2000 and was part of the freight chapter of the Integrated Transport Plan of the Tshwane Metropolitan Municipality.

Road freight transportation compliments the movement of goods from the various seaports and airports in and around Southern Africa. The development of the Maputo Corridor (a toll road from South Africa to Mozambique), Mabopane Centurion Development Corridor (Western by-pass of Pretoria), and the N4 Platinum Toll Highway (Northern by-pass of Pretoria to Botswana) provides additional access for road freight transportation through the Tshwane Metropolitan Municipality area.

Overloaded heavy vehicles decrease the life span of the road structure with added costs for maintenance and rehabilitation of the road pavement. The premature deterioration of infrastructure inevitably compromises road safety, and adds to the high fatality rate on South African roads. While hauliers profit from weak law enforcement, overloaded vehicles are damaging roads, the annual road budget in real terms is diminishing and the condition of roads is deteriorating. As this continues, the long-term consequences are serious and its impact on the economy is the irony.

The management and protection of the road network is necessary, while maintaining the economic base of the freight industry. Until recently, there were many debates and desperate pleas from officials to National government to provide additional funding and efficient law enforcement for heavy vehicle overloading control in South Africa.

A concurrent constraint in overloading control is that the National Department of Transportation does not have an official heavy vehicle overloading statistics reporting system. However, the Centre for Scientific and Industrial Research (CSIR) have a far more representative database from weighbridge operations, but does not cover the whole of South Africa. Without comprehensive accurate statistics it is not possible to develop proper overloading control strategies (1).

In 1995, approximately 20 percent of heavy vehicles were overloaded on South African National roads, resulting in only 9 percent of the national road network classified in good condition. Overloading statistics for 1999, prepared by the CSIR for Gautrans (Gauteng Provincial Department of Transportation), showed 52 percent of 14 700 vehicles weighed at 41 stations in Gauteng, were overloaded.

There are approximately 35 000 heavy vehicles of gross vehicle mass greater than 5.5 tons operating in the Tshwane Metropolitan Municipality jurisdiction. Within the Tshwane Metropolitan Municipality area, only Centurion implements heavy vehicle overloading control effectively. In 1999, 80 percent of 826 vehicles weighed at the Nellmapius Road weigh station in Centurion were overloaded.

Recently (2000-2001), the provinces of Kwazulu Natal and Gauteng implemented overload control initiatives on mostly National routes. The facilities included permanent weighbridges, accommodation for law enforcement officers, and holding facilities for overloaded vehicles. There were even explicit warnings in the media in the respective provinces.

The focus of this paper is concerned on the Overload Control Strategy for the Tshwane Metropolitan Municipality area. Lower order roads are under stress due to overloaded vehicles deviating onto Metropolitan routes. Pavement Management Systems data for the Tshwane Metropolitan Municipality revealed significant deterioration of the road infrastructure, considerably at the road freight generators such as industrial areas.

Overloaded freight vehicles further aggravate the lack of funds to maintain and upgrade roads in the Tshwane Metropolitan Municipality area. Regarding overloading, the Tshwane Metropolitan Municipality is thus faced with the problem to find sufficient funds to control the overloading which will then result in a saving on the road maintenance budget. Thus, there was the urgent need to develop and implement an overload control with the ultimate objective to reduce the financial and economic impact of pavement deterioration in the Tshwane Metropolitan Municipality.

2. Municipal Service Partnerships

The roles of the public and private sectors have changed dramatically over the past 20 years as a result of intense pressure on public sector revenues and increasing competition in the private sector. In developing countries in particular, meeting basic needs and providing poverty-relief measures tend to take precedence over more sophisticated infrastructure and services that are nevertheless vital for economic prosperity and improved quality of life. The other drawback in such countries, apart from the general lack of funds, is the shortage of the necessary expertise at their disposal.

South African municipalities face the challenge of delivering affordable services of an acceptable quality to residents on an equitable and sustainable basis within the context of limited financial and human resources. Many successful local authorities around the world are responding to this challenge by exploring Municipal Service Partnerships (MSP) as a way to enhance service delivery. This approach uses the expertise, investment and management capacity of the private sector to develop infrastructure as well as to improve and extend efficient services. Thus Municipal Service Partnerships, as contained in the Municipal Systems Bill for South Africa, is a paradigm shift in service delivery.

Municipal Service Partnerships can take various forms. At one end of the spectrum, government contracts with a private company for the overall management of a facility, and at the other, there is the ownership and operation of commercial facilities by the private sector (privatisation).

In the first case, the private company has full responsibility for the operation of the facility but it operates within guidelines set by the public sector owner. This can be done through a service contract, a management contract, or a lease. At the other end of the spectrum, within the framework of private ownership, there are several models, such as:

- Build, Operate and Transport (BOT)
- Build, Own and Operate (BOO)
- Build, Own, Operate and Transfer (BOOT)
- Build, Operate, Train and Transport (BOTT)
- Build, Transfer and Lease (BTL)
- Build and Transfer (BT)
- Rehabilitate, Operate and Transfer (ROT)

For example, the Western Cape Department of Transport is operating eight weighbridges, but have a shortage of traffic officers. The Department outsourced manpower from the private sector, as well as management and technical support for a pilot project effective April 2000. Once a suitable system of operation is finalised, all eight weighbridges of the Department should be tendered to the private sector. Private sector companies providing outsourced manpower for a weighbridge is contractually obligated to meet minimum performance measures, as a result of improved overall efficiency of the overload control system (1).

3. Tshwane Overload Control Strategy

The most economic and realistic solution to the overloading problem seems to be the use of a comprehensive and effective law enforcement programme. According to Slavik (2) such a programme should consist of three elements viz., high apprehension rate, hurtful penalties, and successful prosecution.

To achieve a **high apprehension rate**, the law enforcement must be intensive and effective. A network of strategically placed control points, some permanent, some mobile, should operate at all times. Potential violators as a high probability of being caught should perceive the effect of the operation. When considering the consequences, the violators should decide that the risk is not worth taking. This attitude would reduce overloading, which is currently practised by many hauliers as a lucrative transport policy, to a considerably smaller residual level, with only infrequent cases of incidental overloading. Law enforcement should be selective, concentrating with priority on recurrent violators, and on the most afflicted roads. The operation should use uniform procedures, be well co-ordinated countrywide, and harmonised with practices in neighbouring countries. In principle, the contribution to success of a high apprehension rate is much greater than that of penalties. A **penalty is sufficiently hurtful** when it cannot be regarded as a business proposition. Increasing the penalties beyond the magnitude is unlikely to add more power to law enforcement. Although the fines have increased to R120 000, practice shows that a temporary impounding of an overloaded vehicle, together with a need to rectify the load, is feared by the truckers far more than the fine. At present, the penalty structure is not a problem; the law apprehension rate and unsuccessful prosecution is. Successful prosecution, resulting in the conviction of offenders should crown the effort spent on apprehension. Much work is still to be done in this field. Currently, many cases have been lost because of technicalities – usually related to the Trade Metrology Act and the questionable accuracy of truck scales – and also because of magistrates who do not always appreciate the negative impact overloading of trucks have on the economy and society (2).

In order to implement a law enforcement programme which can effectively control overloading in the Tshwane Metropolitan Municipality area it was proposed that a cordon based network of truck overload control stations (TOCSs) be built. The proposed cordons are shown in Figure '6'. Two cordons, an outer one roughly following the Tshwane Metropolitan Municipality boundary, and an inner cordon, were proposed. The outer cordon could accommodate through freight movement, external freight movement and internal-external freight movements. The inner cordon is able to control internal freight movement and also act as a "safety net" for trucks missed by the outer cordon.

If necessary a third cordon, an inner city one, can be considered at a later stage. A total of 12 truck control weigh stations were proposed on the outer cordon and 10 on the inner cordon. A feasibility study was proposed which includes the collection, accumulation, and analysis of comprehensive traffic data at the 22 control points. From the data, a strategy for permanent, temporary, and screening weigh stations could be finalised.

The possible model for overloading control in the Tshwane Metropolitan Municipality could be build and rehabilitate, operate, and transfer permanent and temporary facilities at strategic points on the primary road network of Tshwane.

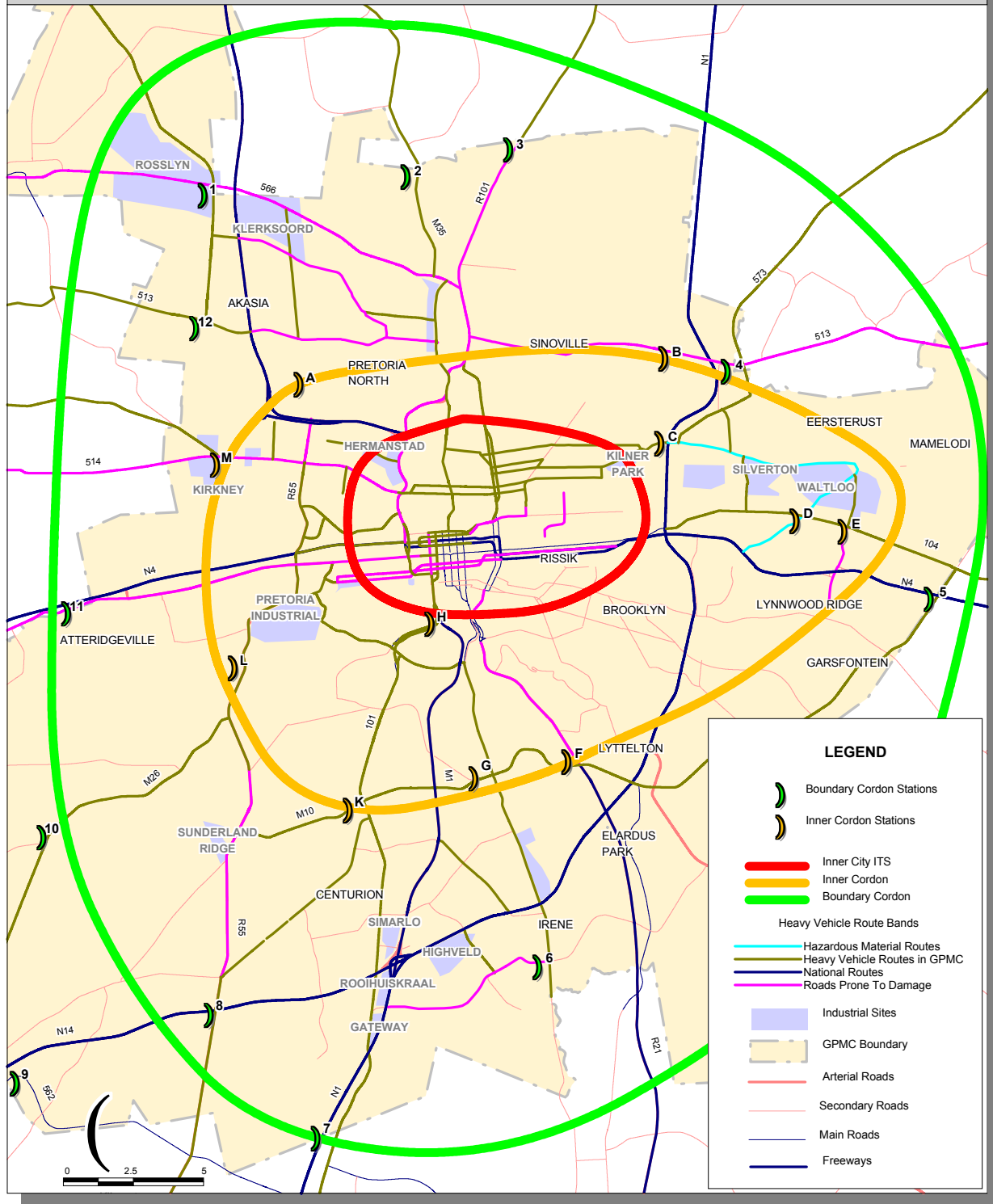
The Municipal Infrastructure Investment Unit (MIIU) was approached for advice and funding. (The MIIU is a section 21 Company established by the government to help municipalities find innovative solutions to critical problems with the financing and management of essential municipal services such as water supply, sanitation, waste, energy, transport, etc. These solutions include the involvement of new parties in service delivery, in various forms of public/private, partnership arrangements.)

The MIIU revealed some major concerns: *From a financial viewpoint, the Municipality does not currently have the resources to implement this project or those resources are committed to other higher priorities. Certainly a Municipal Service Partnership (MSP) with private sector financing is an option but at present there is no secure income stream that will meet the conservative guarantees needed by South African banks to provide the needed capital financing. An annual Municipality budget allocation is subject to future political decisions.*

It was then realised that the Metropolitan Municipality and the Gauteng Provincial Department of Transportation (Gautrans) should consolidate their efforts and funds to carry out the feasibility study. The significance of this public-public venture is appropriate, as there is extensive overload control coverage on both Provincial and Metropolitan roads, including National routes too. The process includes the appointment of a technical facilitator who would assess the data and recommend the feasible overload control strategy for the City of Tshwane that includes an operational strategy, a strategy to upgrade and optimise existing infrastructure, capital costs, operating costs, the economies to scale on road maintenance saving, and the service cost to the Tshwane Metropolitan Municipality.

Gautrans appointed the CSIR to monitor existing overload control points and to determine new control sites for Gauteng. Their database identified seven existing heavy vehicle overloading control points in the Tshwane Metropolitan Municipality area. Hence, apart from the detailed traffic study of the 22 sections, existing weighbridges should also be included in the study. Some of these facilities are currently under-utilised and some not used at all. Two weigh stations are fully functional and only need additional equipment and manpower to monitor a larger geographical area. Existing and proposed new control stations are also indicated in Figure '6'.

FIGURE 6: PROPOSED NETWORK - TRUCK OVERLOAD CONTROL STATIONS (TOCSs)



4. Optimising Existing Infrastructure

4.1 Provincial Weigh Bridges (Gautrans)

The Boekenhoutkloof weighbridge is located about 25km to the west of Pretoria CBD in the vicinity of Hornsnek Road, and is utilised by the Traffic College. Operation is not consistent. In November 1999, 1050 heavy vehicles were weighed, and from January to June 2000, only about 100 vehicles per month were weighed.

The Donkerhoek weighbridge is located about 40km east of Pretoria in the vicinity of the N4, and is operated by the Gautrans Pretoria office. In September 1999, 550 heavy vehicles were weighed. The facility was since vandalised, and was restored in March 2001.

The Wallmansthal weighbridge is a privately owned facility located about 50km north of Pretoria on the N1 and is contracted by Gautrans. This facility is under-utilised by the authorities.

The CSIR also proposed a new facility for the Rosslyn industrial area, in the north-west of Pretoria. The facility was proposed in the Provincial Spatial Development Initiative at Rosslyn.

4.2 Local Authority Weigh Bridges

The Centurion weighbridge is located about 20km south of Pretoria at the Centurion vehicle-testing centre. This facility is thus far the most efficient and effective heavy vehicle overloading control centre in the Tshwane Metropolitan Municipality area. The centre also offers specialised training for officers in overloading control.

The Pretoria weighbridge is located in Pretoria West and is currently used for licensing purposes only.

The Waltloo weighbridge is located in the east of Pretoria, in the vicinity of the Silverton and Waltloo industrial area, and is currently used for licensing purposes only.

5. The Way Forward

It is necessary for the Tshwane Metropolitan Municipality to implement a law enforcement programme preferably via a Municipal Services Partnership mechanism to minimise heavy vehicle overloading and to expedite prosecution of overloaded heavy vehicles in its jurisdiction.

A detailed traffic investigation of the proposed control points in Figure '6' should be carried out and a strategy should be in place. Currently the Tshwane Metropolitan Municipality and Gautrans are procuring funds to carry out the feasibility study. It is also envisaged that the South African National Road Agency Limited (SANRAL) also contribute to the project, since National roads are also covered in the study. However, thus far SANRAL is not willing to participate since it has already contributed massive investments in overloading control in Gauteng. In fact, SANRA's contributions to overload control are more than the mandatory contribution to the National Overload Control Fund. Concurrently, the National Overload Control Fund portion for Gauteng for the year 2000/2001 was utilised for the construction of a permanent overload control station at Heidelberg on the N3, approximately 60-km south-east of Johannesburg.

Once an empirical overload control strategy is finalised, the process thereafter follows the procurement procedure as stipulated in the *Procedural Guidelines for Implementation and Processing of Municipal Service Partnerships for the Tshwane Metropolitan Municipality*. The detailed investigation will be discussed with the Municipal Infrastructure Investment Unit (MIIU) on an advisory basis.

The implementation of the overload control strategy should also actively involve Traffic Chief of the Tshwane Metropolitan Municipality.

Further, the Department of Justice will also be involved to apply stringent measures to prosecute perpetrators and to raise the upper limit of fines for overloaded heavy vehicles. The current fines are not correlated to the damage caused to the road infrastructure, resulting in perpetrators' willingness to pay 'small' fines.

6. References

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2. Slavik, MM. Battle against Overloaded Trucks, Johannesburg 1995.

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Resume of Kollan Pillay

1. A former resident of Verulam, north of Durban.
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4. Employed by the National Department of Transport in 1996.
5. Graduated from Texas A&M University 1999.
6. Currently employed with the National Roads Agency in Pretoria.
7. Seconded to the Tshwane Metropolitan Municipality for experiential training in Transportation Planning and Road Construction.
8. Currently functioning as a resident engineer on the Upgrade of Dr Swanepoel Road north of Pretoria.