

# **THE ROLE OF TRUCK STOP FACILITIES IN COMBATING ROAD FREIGHT FATALITIES ALONG THE NORTH SOUTH CORRIDOR**

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## **ABSTRACT**

On the international level South Africa is regularly singled out as one of the worst performing countries in the World as far as road safety is concerned, including the African continent. In 2011, South Africa recorded a rate of 27.58 compared to the 24.1 deaths per 100 000 population of the African region, (which is also the highest of all the World regions). Each year the number of deaths and disabilities due to road accidents escalate and empirical evidence postulates that 41% of those falling asleep behind the wheel in South Africa are heavy-vehicle drivers.

The paper primarily analyses the role of truck stops along the North South Corridor (NSC) and how such facilities can be deployed as a panacea towards responding to the swelling road freight fatalities. At present, drivers have to utilize unsafe areas such as highway road shoulders that increase the potential of increased accidents and road fatalities. Furthermore such unsafe areas subject truck drivers to theft of cargo which ultimately increases the cost of doing business. The paper is based on a research conducted by the C-BRTA and completed in 2013. In delivering the study, qualitative and quantitative research methods were employed.

It was concluded that the establishment of truck stops can contribute significantly to enhancing road safety whilst also discouraging truck drivers from utilizing often hazardous exit ramps of freeways as parking facilities. The paper recommends interventions that include the establishment of additional truck stops at strategic nodes of the NSC and establishing truck stops in close proximity with each other such that they are able to play a strategic role in minimizing fatigue-related crashes.

## **1. BACKGROUND**

The Global Status Report on Road Safety (2013) highlights that the overall global road traffic fatality rate is 18 per 100 000 population. It further mentions that middle-income countries have the highest annual road traffic fatality rates, at 20.1 per 100 000, while the rate in high-income countries is lowest, at 8.7 per 100 000. With South Africa regularly being singled out as one of the worst performing countries in the World as far as road safety is concerned, it is imperative that lasting solutions are found and implemented. This evidence is further supported by the fact that In 2011 South Africa recorded a rate of 27.58 compared to the average of 24.1 deaths per 100 000 population of the African region which is also the highest in all the World regions according to the World Health Organisation, (2012).

According to the International Transport Forum (2013), South Africa is also ranked the worst out of 36 countries when considering road fatalities, in respect to countries which were assessed. The countries assessed included both developed countries like Australia which recorded 5.6 per 100 000 and also developing countries like Argentina and Colombia which both recorded 12 per 100 000. Additionally, according to Luke et al, 2014, it is also estimated that road crashes have significant financial impact on the country projected to be over R300 billion every year.

It is apparent that the road safety status quo is not ideal, especially from a socio-economic orientation as it contributes significantly to the huge financial burden and road traffic fatalities in South Africa. Findings from empirical research indicate that road traffic fatalities are not circumscribed to a single mode of transport. However the focus of this paper is limited specifically on heavy vehicles.

The occurrence of accidents can be attributed to a number of factors that include infrastructure (road) conditions, weather conditions, driver behavior and the fleet condition. According to Arrive Alive (a South African road safety campaign programme) in South Africa, approximately 41% of drivers falling asleep behind the wheel and ultimately contributing to road traffic fatalities are heavy-vehicle drivers. This indicates that road freight heavy vehicles have a significant impact on traffic fatalities in South

Africa. This practicality is further appended by the findings of (Nordengen, 2009), that there were approximately 13 fatalities per 100 million vehicle kilometers travelled (mvkmt) by heavy goods vehicles. This is very high when compared to many developed countries such as the United States of America, the United Kingdom, Germany, Australia and New Zealand where the rate is between 2 and 4 fatalities per 100 million mvkmt (ibid, 2009).

The one factor which has been identified as contributing to the above mentioned problem is driver fatigue which emanates from driving for long durations coupled with sleep deprivation and ultimately affecting the driving performance of the driver. Fatigue has been identified as a global challenge not only in South Africa but also in developed countries such as United States of America (USA) where fatigue is implicated in 30% - 40% of truck accidents (Gander et al, 2005). Williamson (2007) noted that in New South Wales, Australia fatigue played a role in 20% of fatal crashes while Brookhuis et al, (2003) points to the fact that fatigue related crashes are more likely to be in the region of 7% - 10% in the United Kingdom. What is apparent is that fatigue related crashes affect both developing and developed countries and dealing with the problem requires a holistic solution that proactively addresses the issue of fatigue in heavy vehicle drivers.

In an attempt to respond to the driver fatigue challenge, this paper unravel how truck stops can be of value in relation to overcoming the unsustainable state of affairs, and also the role that such facilities can play in combating road freight accidents. The focus is limited to the South African segment of the North South Corridor (NSC).

## **2. INTRODUCTION**

### **2.1 DEFINING FATIGUE**

The role of driver fatigue management in driving safety is a complex one especially within the context of road freight transport which is the focus of this paper. Therefore even the process of attempting to define the concept is complex, mainly because fatigue is a multi-dimensional matter in its inherent form. However, various definitions which attempt to elucidate the concept of fatigue have been advanced by various scholars and commentators.

In an attempt to provide a broader dimension to the scope of fatigue Åkerstedt and Kecklund, (2000) do so by dichotomizing the different kinds of fatigue into local physical fatigue (e.g. in a skeletal or ocular muscle), general physical fatigue (following heavy manual labour) and central nervous fatigue (sleepiness). The last of these is mental fatigue which is basically when one does not have the energy to do anything. Thiffault and Bergeron, (2003) agree that fatigue can be associated with the length of time spent on a task (e.g. on a particular journey) and cognitive demands of the task. Phillips (2014) appends by indicating that generally, there are two main aspects of fatigue that are considered to be of significance: sleep deprivation and sustained task performance (Phillips, 2014).

What is evident from the above definition is that fatigue cannot be simply viewed as a function of the duration of time engaged in work (or any other activity). The key factor that should be appreciated is that where there is a lack of sufficient restorative sleep, the fatigue threshold may be affected over a period of days or weeks. So in other words where there is a lack of sleep the driver is more likely to suffer from fatigue.

### **2.1.1 IMPACT OF FATIGUE ON DRIVER PERFORMANCE**

Curcio et al, (2001) and Lim and Dinges, (2010) highlight that sleep deprivation has been shown to have significant impact on cognitive functions of the brain including alertness, perceptual skills, reaction times, psychomotor coordination, judgments, decision making and risk propensity. Krueger (1989) supports this view as he indicates that sustained task performance brings additional problems, specifically performance decrements. In essence meaning that, the longer a task is performed, the worse it is carried out, a fact that has been confirmed in both laboratory studies and also among drivers in real driving conditions.

Swart and Sinclair (2015) when concluding on the impact of fatigue on driver performance place great emphasis on the fact that fatigue, is as a result of lack of sleep, or sustained time driving, or a combination of the two. In addition fatigue has the potential to affect every aspect of a driver's performance to an extent that fatigued

drivers fail to fully gauge the extent of their own impairment, which increases the probability of an accident occurring.

## **2.2 CHALLENGES IN ADDRESSING FATIGUE IN SOUTH AFRICAN HEAVY VEHICLES INDUSTRY**

The current challenge in South Africa is that driver fatigue is not normally referred to on road accident report forms due to the fact that the current legislation is vague when it comes to addressing fatigued driving as an offence. This means that a driver can cause an accident however they will not be prosecuted due to the fact that fatigue is not considered to be an offense according to the current Road Traffic Act 93 of 1996. Swarts and Sincler (2015) append upon this dilemma by indicating that a driver can be prosecuted for failing to stop driving temporarily, but may not be prosecuted simply for driving when fatigued.

Many commentators have highlighted that the current state of affairs is aggravated by the lack of a concerted effort in providing a strong and coherent regulatory framework which specifies driving hours and resting duration with a view to reduce the incidence of fatigue in South Africa. It should be noted that as much as a sound framework is critical towards addressing the complexities that result from driver fatigue, there is also a need to address the provision of adequate and safe parking facilities where fatigued drivers can stop and take resting intervals.

In light of the above, it is apparent that advocating for driving regulations alone will not resolve the current challenge particularly if the step is undertaken without addressing the provision of ideally located safe and reliable parking facilities where drivers can rest without being apprehensive about the safety of the vehicle and cargo. It is on this basis that this paper advocates for truck stops as a panacea which can respond to the rising road freight traffic fatalities and incidences of the same, which in most cases result from fatigued driving.

### **3. THE STUDY DESIGN**

In delivering this paper, extensive literature review on the role of truck stops in relation to fatigue management was undertaken. There were also interviewer-administered questionnaires with truck drivers and truck stop managers. In addition there were direct observations at 12 truck stops located along the NSC. The truck stops which were visited are located along the NSC segment which is from Durban to Musina. The main study limitation was that the study only focused on the truck stops within South Africa borders. However, the rationale for selecting this particular segment of the corridor was further informed by the fact that the NSC would give a reliable sample of the inherent characteristics of trucks stops in the country. Lastly, the NSC corridor is the busiest corridor in the SADC region in terms of heavy vehicles volumes, values and volumes of freight, and also fulfills the strategic role of linking South Africa with the rest of Africa.

### **4. OVERVIEW OF THE CONCEPT OF TRUCK STOPS**

There is a global appreciation that truck stops have gone through a process of metamorphosis over the past decades, from merely being viewed as diesel gas facilities on the highways for large delivery trucks to being recognized as integral transit hubs for long distance truck drivers. In support of this notion Stanford et al, (2008) points out that truck stops have transformed significantly, by incorporating bigger restaurants, more food offerings, more truck services beyond tyres. He further highlights that truck stops have advanced their service offerings and products to meet the needs of fatigued drivers, particularly those undertaking long distance transportation (ibid , 2008).

In an attempt to maximize the benefits of truck stops, different countries have employed various interventions which in essence seek to enhance the role of truck stops in relation to driver fatigue management whilst also meeting the operational needs of drivers. The lessons below from different countries, share one common theme which is to enhance traffic flow movement and the safety of drivers and cargo along the journey through truck stops.

## **4.1 Australia**

Australia is one of the more advanced countries in regard to responding to fatigue management for Heavy Goods Vehicles. This view is well demonstrated by the fact that the role of truck stops in relation to fatigue management is accentuated in their national department of road transport policy. (For example the policy makes reference to the primary amenities that should be incorporated in truck stops and also technical configuration of such facilities).

In addition, the framework further makes reference to the spatial location of these facilities; it further indicates that truck stops should be spaced at approximately 80 km intervals, taking into account towns and commercial facilities. The intent is to ensure that truck stops are located in a manner that responds to driver fatigue and also play an instrumental role in minimizing fatigue-related crashes.

## **4.2 United Kingdom**

In the United Kingdom (UK) the term lorry park is often used and can be considered to be the predominant term rather than truck stop, (Department for Transport, 2009). The importance of truck stops in the UK is not only appreciated from an amenity offering perspective, but also from a national planning policy point of view which is reflected on the (national planning policy guidance framework 13). The policy seeks to identify project sites and routes where infrastructure can be developed for the purposes of contributing to the seamless of mobility along the highways (ibid, 2009). Although the plan is not specific in terms of the form of infrastructure which should be developed, it does however encourage the development of trucks stops closer to each other along the corridor.

The rationale is that when truck stops are built closer to each other, they are able to play strategic role in minimizing fatigue-related crashes as a result of ensuring drivers get enough sleep and avoid extended periods of wakefulness as also reflected in the case of Australia.

### **4.3 United States of America**

The process in the United States of America (USA) has its roots in the Highway Act of 1956, which initiated significant changes in government responsibility for the development of highways in the USA. The Act further encourages the development and growth of truck stops (Fowler, 1987). Presently, in the USA there is a guiding framework pioneered by the Bureau of design and environment which is centered on spacing, siting and design of rest areas. The purpose of the framework is essentially to counter-measure elements such as the increasing rate of informal trucks stops along corridors. Informal facilities in this scenario relate to the highway shoulders and ramps or facilities which are located in areas that are not supported by the land use and environmental policy. The other reason is also to ensure that the trucks stops spatial location responds to driver fatigue factors.

### **4.4 Namibia**

Within the SADC region some strides to improve the status quo have been undertaken. Earley et al, (2009) outlines that the latest development has been in Namibia, where many export goods go through the Port of Walvis Bay, which is the shipping and transportation hub of the country. He further argues that given the understanding that there are certain nodes of the corridor that are currently unsafe for drivers, and theft is reported to be frequent, drivers usually force themselves to continue driving even when fatigued due to the fright of stopping along the corridor to rest.

Thus, a bold step has been taken in an attempt to respond to the current state of affairs, through a feasibility study which identifies the ideal location for truck stop facilities along the corridor, with a view to improve the level of existing infrastructure which can support a safe environment for drivers especially those who might suffer from fatigue along the journey.

### **4.5 SUMMARY**

It is apparent that truck stops have been through a metamorphosis. This is well demonstrated by the fact that, the placement of truck stops has been underpinned by

empirical research and policy. It is also evident, that most truck stop plans take into account factors such as the intervals between each stop and nearby settlements and their existing infrastructure

Furthermore, there is also the complimentary view between countries like Australia and the USA on the need to establish truck stop in close proximity with each other such that they are able to play a strategic role in minimizing fatigue-related crashes.

## **5. FINDINGS FROM SURVEYS**

Against this background of the role of truck stops in addressing driver fatigue in the international road transport environment, questionnaires were administered to one hundred long distance and cross border road freight drivers. The focus was on driver fatigue, the role of truck stops in combating road freight fatalities from an operator and administrative perspective and lastly, the perceptions of NSC corridor stakeholders on the possible role of truck stops in combating road freight fatalities. Ninety of the drivers completed questionnaires whilst the incomplete ten were not considered as they could compromise the integrity of the data.

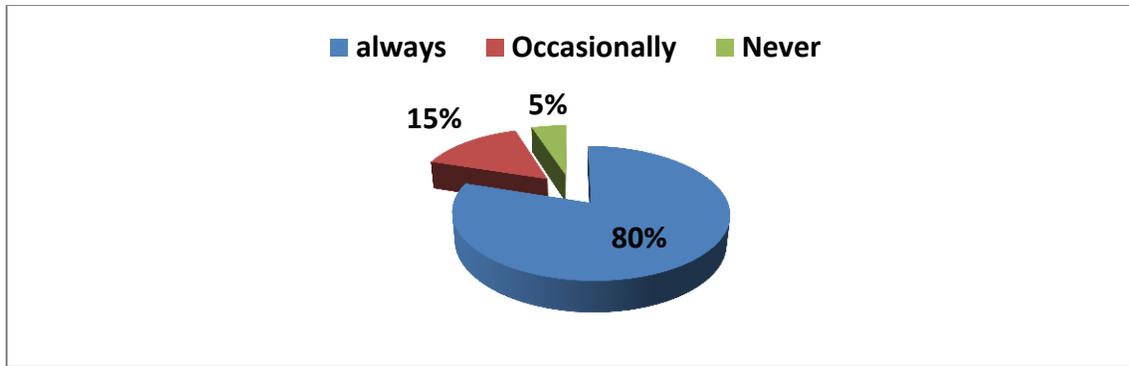
In addition to the truck driver questionnaires, interviews were conducted with all truck stop managers from the 12 truck stops which were visited. The findings from the field work are discussed below.

### **5.1 Driver fatigue Survey**

The questionnaires distributed to the drivers focused on frequency of use of truck stops by the drivers, frequency of use of road shoulders, adequacy of truck stops, location of truck stops, whether more truck stops should be constructed or not and their views on truck stops as tools that can be used to improve road safety. Below are the major findings based on the data received from the drivers.

#### **5.1.1 Frequency of use of truck stops by drivers**

Figure 1: Frequency of utilization of truck stops



This particular question was probed for purposes of establishing the frequency of utilization of truck stops by drivers. The outcome of the question would then serve as a basis for the advancement of a definitive case on the integral role of truck stops along the corridor particularly from a road safety context.

The survey reflected that 80% drivers regularly use truck stops while only an insignificant proportion of 15% was recorded as not frequent users of such facilities. Lastly only 5% indicated that they don't utilize the facilities at all. The staggering percentage of 80% suggests that drivers consider truck stops as important facilities along the corridor for either resting or safe parking.

Furthermore the percentage suggests that truck stops are highly in demand, thus suggesting there is a need for investigating the need for development of more facilities especially in segments of the corridor where these facilities are inadequate.

### **5.1.2 Frequency use of road shoulders**

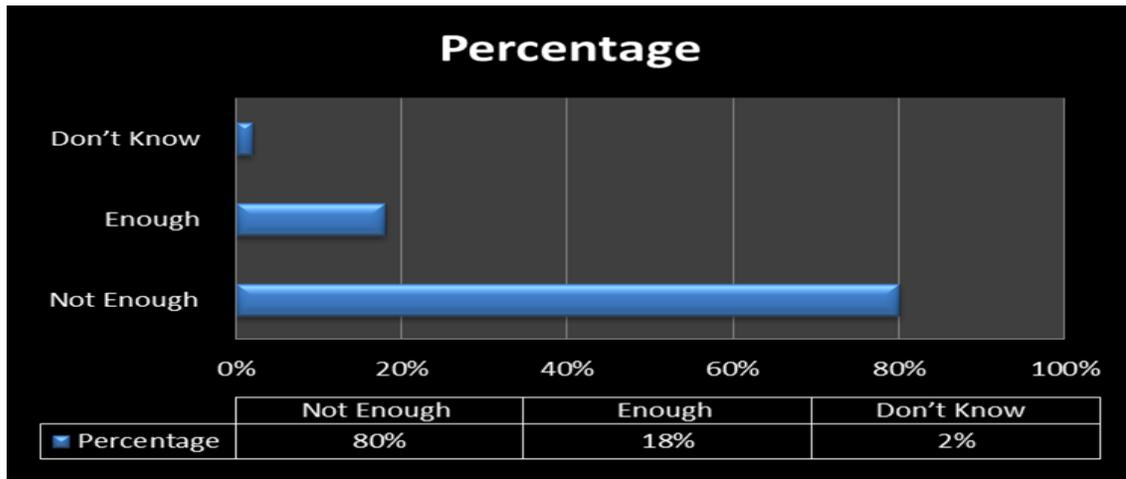
As much as it was important to understand the proportion of truck drivers who utilize truck stops, it was equally important to establish the proportion of drivers who uses unsafe areas such as road shoulder for parking purposes. This would inform decisions to investigate the reasons for non-utilisation of designated truck stops, which could for instance be undesirable location.

The outcome reflected that the majority, being 67% hardly utilise the road shoulder, which is encouraging since there is anecdotal evidence that some drivers stop along road shoulders creating opportunities and high risk for accidents.

It was also noted that 30% of the truck drivers occasionally use the road shoulders mainly because they travel at night along the corridor (between Pretoria and Musina) which does not have adequate truck stop facilities. The deduction, which could be made from the 30% that occasionally use unsafe areas, is that due to the lack of capacity in truck stops along the Gauteng to Beitbridge segment of the NSC, drivers end up using unsafe parking areas. There was also a generic indication from drivers that the majority force themselves to continue driving even when fatigued due to the inadequate number of facilities along the corridor until they reach the nearest truck stop.

### 5.1.3 Adequacy of truck stops along NSC

Figure 2: Adequacy of truck stops



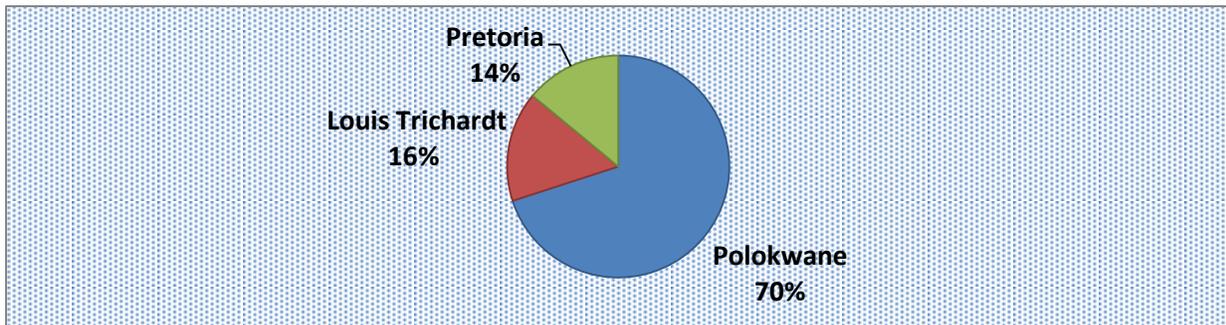
In respect to adequacy of truck stops, 80% of the truck drivers indicated that currently there is a shortage of truck stops along the corridor particularly on the segment from Gauteng to Musina. The drivers indicated that currently they utilize a parking area called Vivo located after Polokwane. According to the drivers the area is not a proper truck stop as it lacks the essential amenities such as security features, sufficient illumination and adequate parking.

Only 18% of the respondents indicated that the current facilities are adequate whilst 2 % were uncertain. The majority did however propose that government should spearhead the process of acquiring land and furthermore identify communities that can be

empowered through the development of additional truck stops facilities along the corridor.

#### 5.1.4 Location for additional truck stop

Figure 3: Ideal location for an additional truck stop along the NSC



It was also important to probe further, regarding the thinking of truck drivers on probable ideal location of additional truck stops along the NSC. A 70% majority indicated that the ideal location would be within the Polokwane jurisdiction. This notion was further triangulated by the fact that truck drivers regularly stop after every 200 to 250km distance from their point of departure. This would mean that for a driver commencing a trip in Johannesburg going to Zambia, their first stop of 200km would be within the Polokwane jurisdiction thus making the location ideal for an additional facility.

However, it was proposed that future provision should be made for the rising traffic flow considering that the NSC extends across the territories of three Regional Economic Communities (RECs) namely: the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and Southern African Development Community (SADC). Furthermore, the corridor also serves as the main transport route linking coastal countries to landlocked countries like Zimbabwe, Zambia and the Democratic Republic of Congo (DRC).

#### 5.1.5 Truck Stops: A road safety tool

About 97% of the respondents agreed that truck stops are an important road safety tool, while only 3% indicated that truck stops do not have any significant relationship with road safety.

The majority of respondents revealed that if the truck stop agenda can be driven vigorously, it can bear tangible results toward improving the state of road safety especially from a road freight perspective.

The drivers further indicated that truck stops are good facilities which provide necessary and supplementary amenities that enhance their health along the journey. However, they also indicated that truck stops location should be prioritized with a view to respond strategically to minimise fatigue-related crashes.

## 5.2 Truck Stop administration interviews

In this regard, 12 truck stops were visited along the NSC and interviews were conducted with managers of truck stop facilities.

Figure 4: Overview of truck stops and their spatial location along the corridor

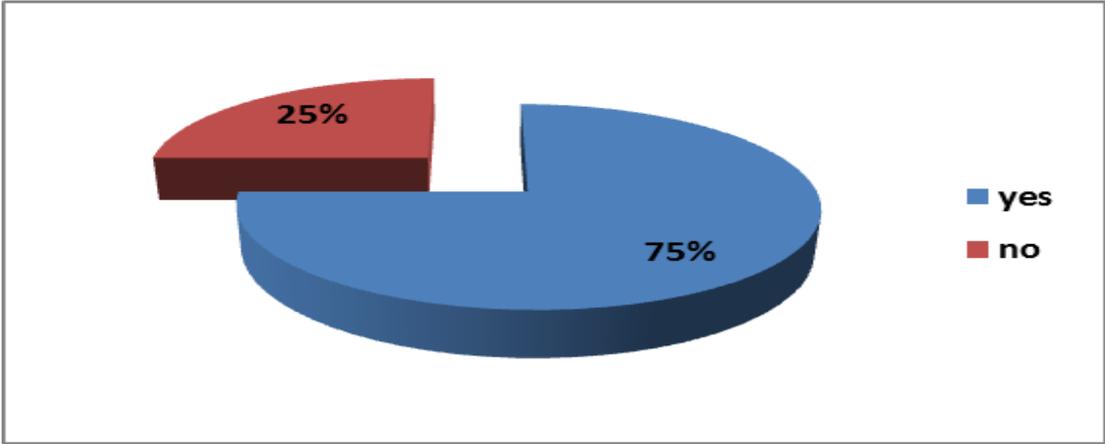
NAME OF TRUCK STOP	SPATIAL LOCATION ALONG THE NSC	ROUTE
Gateway Truck Stop	Limpopo (Musina)	N1
Limpopo Truck Stop	Limpopo (Musina)	N1
Silver Falls Truck Stop	Limpopo (Musina)	N1
Pro Tech truck Stop	Limpopo (Musina)	N1
Waste and Cars Truck Stop	Limpopo (Musina)	N1
Dube Truck Stop	Limpopo (Musina)	N1
Sydney Road Truck Stop	KZN (Congela)	N3
Marian Hill Truck Stop	KZN (Pinetown)	N3
Manburg /Wozani Berg Gasoline	KZN (Port Shepstone)	N3
Warden Truck Sop	Free State (Warden)	N3
Balmoral	Free State (Harrissmith)	N3
Monte Vista	Free Sate ( Harrissmith)	N3

Interviews were typically undertaken prior to guided tours around truck stop facilities. The interviews were designed to be flexible in order to extract as much information as possible from the respondents.

Most of the questions were open-ended, giving the respondents and the researcher the opportunity to pursue some issues in greater depth. The major issues discussed were on the extent of utilisation of truck stops and other mechanisms that can be used to complement the role of truck stops on fatigue management. Below are the major findings based on the data received.

**5.2.1 Is truck stop utilization improving or not**

Figure 5: Truck stop utilization



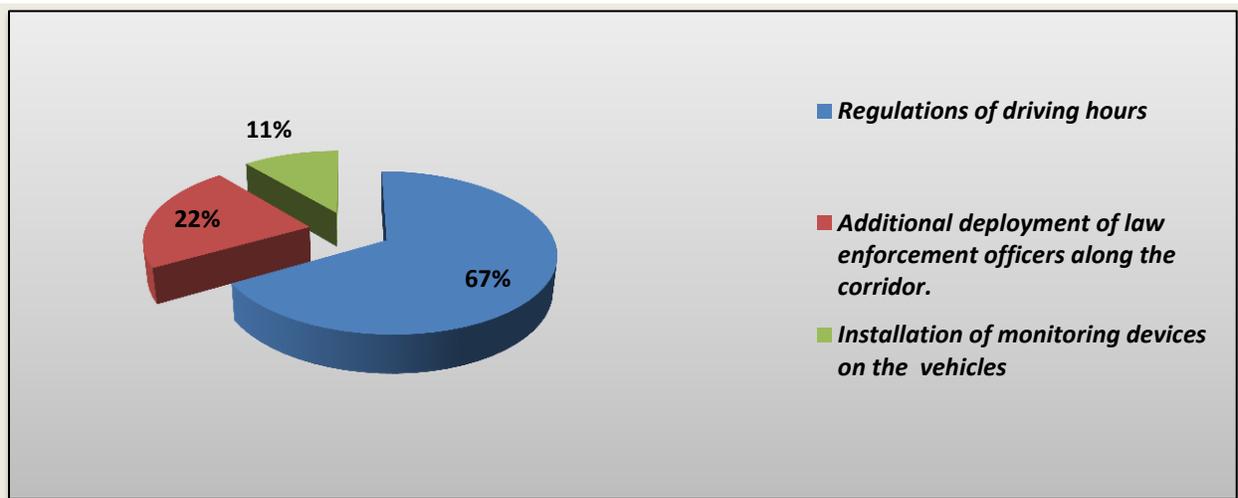
The basis for the question was to establish whether the use of truck stops by truck drivers improved or regressed over the past years, based on the experience of truck stop facilities management. A 75% of the respondents indicated that the usage of truck stops has improved in South Africa particularly during the past decade. This was largely attributed to the growing demand in road freight movement along strategic corridors and also the modal shift from rail to road in the conveyance of cargo.

There was however a perception that government can and should intensify the level of cooperation with the private sector. The assumption was that the private sector is currently incurring a colossal financial burden from land acquisition and ultimately operational costs without involvement of government at any stage of the development of truck stops. It was on this basis that truck stop management recommended that joint ventures between government and the private sector should be considered in order to encourage further development of truck stops along the NSC.

Only 25% indicated that truck stops are not improving and the notion was primarily informed by the fact that drivers still opt to utilize the road shoulders over truck stops facilities mainly due to the fact that they spend the money allocated for truck stop parking on other activities.

### 5.2.2 Which other complimentary instruments can be employed to support truck stops in combating driver fatigue

Figure 6: Complementary instruments to support truck stop



Truck stop managers were requested to point out other complementary measures which can be employed to enhance the role of truck stops in responding to driver fatigue and ultimately road fatalities. A 67% majority indicated that the development and implementation of driving time regulations would be the most complementary instrument that can encourage drivers to use truck stops when experiencing fatigue.

Nearly a quarter, (22%) indicated that additional deployment of law enforcement officers would deter drivers from continuing with long journeys when fatigued, while only 11% indicated that installation of monitoring devices in vehicles which would establish the distance travelled by the driver and the frequency of resting intervals would be of value.

Based on the findings, it is apparent that drivers are willing to utilize truck stops. However, the primary challenge along the NSC is that the current capacity is not adequate in regard to the current and future demand in traffic flows. Additionally, there is evidence that additional trucks stop(s) are necessary along the Gauteng to Beitbridge

segment of the NSC to meet current traffic flow. To boot, the majority of truck drivers mostly utilize unsafe parking areas due to the unavailability and un-ideal location of truck stops along the NSC. Furthermore, the generic consensus was that truck stop facilities can be employed as a road safety instrument which can respond to fatigue and road freight crashes particularly for heavy vehicles. Lastly, a cooperative approach was identified to be important towards enhancing the role and value of truck stops in responding to road safety improvement.

## **6. KEY PRACTICAL STEPS TOWARDS THE ESTABLISHMENT OF TRUCK STOPS ALONG THE NSC**

In the 2005 Freight and Logistics Strategy Department of Transport, (2005), the Department recognized the need for the establishment of truck stops along strategic corridors for purposes of responding to road safety dynamics within the road freight subsector. In addition, there was also the realization that road freight plays an integral role towards the development of the economy and this view was supported by empirical evidence suggesting that about 80% of freight in South Africa is transported by road (Department of Transport, 2005).

In view of the above, whilst there has been the indication that road freight contributes significantly towards economic growth, there is also evidence that road freight is beset with the challenge of road crashes in the transportation of goods. As indicated previously, a significant proportion of accidents that occur on South Africa's roads are caused by heavy vehicles, thus justifying the need for the establishment of truck stops with a view to enhance the safety of drivers, vehicles and cargo.

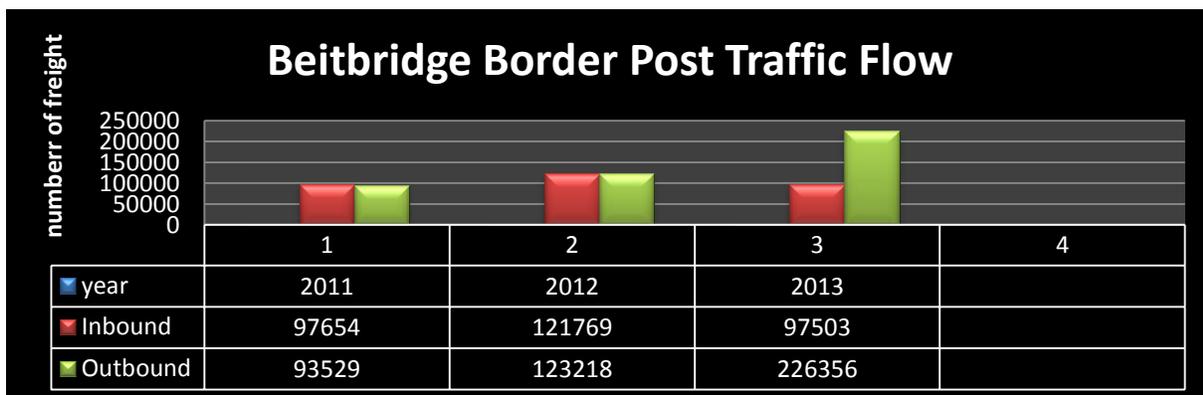
The establishment of adequate truck stops facilities along the corridor is envisioned to enhance service provision for road freight drivers particularly those undertaking long distance transportation. However, in order to realize such gains the following practical steps will have to be prioritized:

- (i) Firstly, identification of secure sites for the development of truck stops along the NSC corridor. Currently, the spatial location of truck stops along the NSC is not informed by empirical research. A lot of the facilities are centralized in close

vicinity to the border post (Beitbridge) which ultimately lead and contribute to traffic congestion. Out of the 12 trucks stops which were visited along the corridor five are within the border mouth of Beitbridge. This suggests that the current truck stop spatial arrangement is not adequately responsive to road safety needs. This view is well underpinned by the fact that a truck can travel approximately 600km from Johannesburg to Musina without coming across a truck stop. The development of a truck stop planning framework would respond to the current disjuncture in truck stop planning and spatial location which in essence negates the benefits of safe and seamless traffic flow along the corridor.

- (ii) Secondly, there is empirical evidence on the ground which indicates that the rise in traffic flow is not matched by growth in truck stop capacity. Below is a table indicating the annual traffic flow transiting Beitbridge which is the busiest border along the NSC.

Figure 7: Beitbridge Border Post Traffic Flow



Source Border Control Operational Coordinating Committee (BCOCC), 2014

The above figures reaffirm the view that traffic flow is increasing annually. One approach of dealing with the growth would be through the development of a *standard methodology framework* for the monitoring, measurement and forecast of truck stop demand along the NSC which can also be appropriated to other corridors depending on its reliability and effectiveness.

- (ii) Thirdly, the development of truck stops standards manual will be essential. Currently the amenities offered in truck stops vary due to the absence of a

standardized framework especially from a security perspective. It is envisaged that the standards would be designed to set a series of objectives relating to security measures and essential features such as ablution facilities and sufficient illumination within the facilities. The rationale for the development of this tool is to encourage drivers to make use of truck stops rather than unsafe parking areas along road shoulders which generally compromise the safety of the cargo and vehicles.

- (iii) Fourthly, government has had a circumscribed role in driving the truck stop agenda. One way of remedying the current situation would be through a joint venture with the private sector. The current model for the management of weighbridges is one approach which has proven to be effective, whereby government enters into Public-Private-Partnership (PPP) agreement with the private sector for purposes of building and operating weighbridges. The same approach could be taken in the provision and administration of truck stops. This model would also go a long way in responding to the broader national imperatives such as the need for skills transfer, job creation and reducing poverty.

It is apparent that one bold step in addressing current challenges would be the establishment of a holistic truck stop framework which would seek to respond to the disparities in spatial planning, location and features of truck stops. Furthermore, the framework would go a long way in affirming the view that the truck stop concept is not a transport self-serving program but also seeks to respond to the socio-economic imperatives of the country such as unemployment, inequality and poverty. Lastly, the framework will provide a solid platform in transforming the NSC from being a merely transport corridor towards becoming an economic development corridor, which can enable sustainable economic development along the corridor.

## **7. CONCLUSIONS**

Based on the findings obtained from the study, the following conclusions can be drawn:

- Fatigue contributes significantly to road fatalities especially from a road freight perspective. This challenge is experienced in both developed and developing countries;
- The absence of a concrete framework for driving time regulation creates opportunities for drivers to drive longer distance whilst fatigued;
- Evidence from international best practice indicates that truck stops development is an integral component for corridor development and advancement of road safety;
- In countries such as Australia and United Kingdom spatial placement of truck stops is approximately 80 km (50 miles) in intervals. This emphasises the need to seriously consider spatial location when planning for truck stops and the closer they are, the better effect they will have on enhancing road safety;
- International best practices coupled with field work revealed that development of a truck stop framework would go a long way towards addressing modalities of truck stop location, space intervals and features;
- The field work also revealed there is a disjuncture between current truck stop planning and the needs of the end-users on the ground;
- It was also established that there is a need for additional truck stop facilities along the NSC particularly within the Polokwane jurisdiction;
- A joint venture model should be considered in responding to the need for more truck stops along the NSC; and
- Of critical importance is the fact that 97% of the respondents indicated that truck stops are an important road safety instruments which can combat driver fatigue and in the long run improve road safety.

## **8. MAJOR RECOMMENDATIONS**

The following recommendations serve as a basis for further deliberations on truck stops, managing fatigue and road safety by transport stakeholders. The recommendations are meant to foment a thinking which will respond to the key challenges facing the industry.

## **8.1 The need for a truck stop framework**

When assessing the challenges within the status quo it is evident that a great portion emanate from lack of a truck stop guiding framework. The need for a framework is informed by the understanding that currently there is no document that responds to imperatives as to where truck stops should be located along the nodal points of the corridor. The framework should be informed by practical modalities, international practices and most importantly driver's needs and it should incorporate the needs of all stakeholders and aim to respond to the following elements:

- Guidelines for truck stop development;
- Institutional arrangement framework for truck stops;
- Spatial location of truck stops along corridors;
- Composition of amenities in truck stops; and
- Security features in truck stops.

## **8.2 Establishment of an additional Truck stop along NSC**

The establishment of an additional truck Stop within the Polokwane area is recommended. However a buffer zone should be maintained between any nearby communities and the truck stop to prevent problems such as noise disturbances and the risk to flammable and dangerous goods for nearby residents.

The provision would improve safety and also combat the high rate of cargo theft long the NSC which normally occurs when drivers park along the road shoulders. Proper planning will have to be done to avoid having a disjuncture in planning and operations which is reflected by the status quo whereby truck stops are not placed strategically to respond to driver fatigue.

## **8.3 Involvement of all three spheres of government**

In order to alleviate the burden from the private sector in the development of truck stops local municipalities, provincial and national authorities should plan to incorporate programs such as truck stops in their Integrated Strategic Plans.

#### **8.4 Driving Time Regulations**

The establishment of additional truck stops in isolation from the implementation of driver regulations will have a limited impact on managing fatigue and consequently road safety. It is therefore essential that the development of more truck stops should be complemented by implementation of driver regulations for purposes of ensuring maximum impact is achieved for the benefit of the transport industry.

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