

# The Establishment of Truck Stops Along the Walvis Bay Corridors



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This report represents the work of four WPI undergraduate students  
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## **ABSTRACT**

We created this report to help the Walvis Bay Corridor Group create truck stops in Namibia to improve the country's transportation infrastructure for truck drivers. We conducted a survey of truck drivers and numerous interviews with relevant companies to determine what services truck stops in Namibia should feature and where they should be located. Furthermore, we made recommendations about how to expand our plan to install truck stops in additional locations in the future.

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Abstract	Brian Earley
Executive Summary	Craig Jones
1. Introduction	Craig Jones
2. Background	Brian Earley
2.1 History of Truck Stops in the United States	Brian Earley
2.2 Benefits of Truck Stop Installation	Brian Earley
2.3 Placement Planning	Brian Earley
2.3.1 Spacing Intervals	Brian Earley
2.3.2 Nearby Settlements	Bryan Rickard
2.4 Amenities	Brian Earley
2.5 Health Services	Craig Jones
2.6 Technical Guidelines	Brian Earley
2.7 Situation in Namibia	Anthony Laine
2.7.1 The Corridors	Anthony Laine
2.7.2 Existing Truck Ports	Anthony Laine
2.7.3 Port of Walvis Bay	Bryan Rickard
2.7.4 Future Driving Laws	Brian Earley
2.8 Summary	Brian Earley
3. Methodology	Brian Earley
3.1 Determining Truck Stop Features	Brian Earley
3.1.1 Survey of Truck Drivers	All
3.1.2 Interviews with Transport Company Owners	Anthony Laine
3.1.3 Discussions with Truck Stop and Truck Port Representatives	Bryan Rickard
3.1.4 Interviews with Health Services Representatives	Brian Earley
3.1.5 Traffic Data Collection	Craig Jones
3.2 Truck Stop Design	Craig Jones
3.3 Identifying Additional Locations for Truck Stops	Brian Earley
3.3.1 Examination of Driver Behavior	Craig Jones

3.3.2 Identifying Existing Service Stations	Bryan Rickard
3.4 Summary	Brian Earley
4. Results and Analysis	Brian Earley
4.1 Truck Stop Features	Brian Earley
4.1.1 Security	Brian Earley
4.1.2 Parking	Brian Earley
4.1.3 Wellness Centre	Brian Earley
4.1.4 Take-Away & Restaurants	Anthony Laine
4.1.5 Convenience Store	Brian Earley
4.1.6 Bed & Breakfast	Brian Earley
4.1.7 Fuel	Anthony Laine
4.1.8 Toilets, Showers, & Laundry	Anthony Laine
4.1.9 Maintenance Garage	Anthony Laine
4.1.10 Banking	Anthony Laine
4.1.11 Payphones	Anthony Laine
4.1.12 Leisure & Entertainment	Craig Jones
4.1.13 Internet Access	Craig Jones
4.1.14 Feature Layout	Craig Jones
4.2 Locating Truck Stops	Craig Jones
4.2.1 Traffic Data Analysis	Craig Jones
4.2.2 Truck Driving Hours	Bryan Rickard
4.2.3 Pre-determined Locations	Craig Jones
4.2.4 Additional Truck Stop Locations	Craig Jones
4.4 Effects of Truck Driver Sampling	Anthony Laine
4.5 Economic Analysis	Brian Earley
4.6 Summary	Craig Jones
5. Conclusions	Brian Earley
5.1 Truck Stop Services	Brian Earley
5.2 Truck Stop Locations	Brian Earley
5.3 Method for Determining Expansion Criteria	Bryan Rickard
5.4 Stations for Renovation	Brian Earley
6. Recommendations	Craig Jones
6.1 Truck Stop Economic Analysis	Bryan Rickard
6.2 Future Truck Stop Locations	Craig Jones

6.3 Service Station Visitation	Craig Jones
6.4 Cooperation with Current Truck Port Owners	Craig Jones
6.5 Dry Port	Craig Jones
6.6 Road-Rail Connection	Craig Jones
6.7 Security Liability	Craig Jones
6.8 Projected Traffic Increases Due to Port Expansion	Craig Jones
6.9 Influence of Laws on Traffic	Craig Jones
Acronyms & Terminology	Bryan Rickard
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## TABLE OF CONTENTS

Abstract.....	ii
Acknowledgements.....	iii
Authorship.....	iv
Table of Contents.....	vii
Table of Figures.....	xi
Table of Tables.....	xiii
Executive Summary.....	xiv
1. Introduction.....	1
2. Background.....	4
2.1 History of Truck Stops in the United States.....	4
2.2 Benefits of Truck Stop Installation.....	5
2.3 Placement Planning.....	6
2.3.1 Spacing Intervals.....	6
2.3.2 Nearby Settlements.....	9
2.4 Amenities.....	10
2.4.1 Food.....	10
2.4.2 Fuel.....	11
2.4.3 Parking.....	11
2.4.4 Parked Services.....	12
2.4.5 Leisure & Entertainment.....	14
2.4.6 Information Services.....	14
2.4.7 Lodging.....	14
2.4.8 Miscellaneous Services.....	15
2.5 Health Services.....	16
2.5.1 HIV/AIDS.....	16
2.5.2 Malaria.....	17
2.5.3 Other Treatable Diseases.....	18
2.5.4 General Health Care.....	18
2.6 Technical Guidelines.....	19
2.6.1 Site Guidelines.....	19
2.7 Situation in Namibia.....	20
2.7.1 The Corridors.....	20

2.7.2 Existing Truck Ports .....	21
2.7.3 Port of Walvis Bay .....	21
2.7.4 Future Driving Laws.....	22
2.8 Summary .....	23
3. Methodology .....	24
3.1 Determining Truck Stop Features .....	24
3.1.1 Survey Of Truck Drivers .....	24
3.1.2 Interviews With Transport Company Owners.....	27
3.1.3 Discussions With Truck Stop and Truck Port Representatives.....	28
3.1.4 Interviews With Health Services Representatives.....	29
3.1.5 Traffic Data Collection.....	29
3.2 Truck Stop Design.....	30
3.3 Identifying Additional Locations for Truck Stops .....	31
3.3.1 Examination Of Driver Behavior .....	31
3.3.2 Identifying Existing Service Stations .....	31
3.4 Summary .....	32
4. Results and Analysis .....	34
4.1 Demand for Truck Stop Features .....	34
4.1.1 Security.....	34
4.1.2 Parking.....	36
4.1.3 Wellness Centre.....	37
4.1.4 Take-Away & Restaurants.....	40
4.1.5 Convenience Store.....	42
4.1.6 Bed & Breakfast .....	42
4.1.7 Fuel.....	44
4.1.8 Toilets, Showers, & Laundry.....	45
4.1.9 Maintenance Garage .....	47
4.1.10 Banking.....	49
4.1.11 Payphones.....	49
4.1.12 Leisure & Entertainment .....	50
4.1.13 Internet Access .....	51
4.1.14 Feature Layout.....	52
4.2 Locating Truck Stops .....	54

4.2.1 Traffic Data Analysis.....	55
4.2.2 Truck Driving Hours .....	58
4.2.3 Pre-determined Locations.....	59
4.2.4 Additional Truck Stop Locations .....	62
4.3 Effects of Truck Driver Sampling.....	66
4.4 Economic Analysis.....	67
4.5 Summary .....	67
5. Conclusions.....	69
5.1 Truck Stop Services .....	69
5.2 Truck Stop Locations .....	70
5.3 Method for Assessing Expansion Capability .....	71
5.4 Stations for Renovation.....	72
5.5 Benefits of Truck Stop Implementation .....	72
5.5.1 Benefits for Truck Drivers.....	73
5.5.2 Benefits for Transport Companies.....	73
5.5.3 Benefits for Municipalities .....	74
5.5.4 Benefits for Funders .....	74
6. Recommendations.....	75
6.1 Truck Stop Economic Analysis.....	75
6.2 Future Truck Stop Locations.....	75
6.2.1 Lusaka, Zambia .....	76
6.2.2 Southern Namibia .....	76
6.3 Service Station Visitation.....	77
6.4 Cooperation with Current Truck Port Owners .....	77
6.5 Dry Port.....	78
6.6 Road-Rail Connection.....	79
6.7 Security Liability.....	79
6.8 Projected Traffic Increases Due to Port Expansion .....	79
6.9 Influence of Laws on Traffic.....	80
References.....	81
Acronyms & Terminology .....	86
Appendix A: Walvis Bay Corridor Group Profile .....	87
Appendix B: Preliminary Survey.....	89

Appendix C: Truck Driver Survey.....	91
Appendix D: Montana Rest Area User Amenity Survey Results .....	93
Appendix E: Port of Walvis Bay and Luderitz Statistics.....	94
Appendix F: Transport Company Interview Protocol .....	95
Appendix G: Truck Stop Company Interview Protocol .....	96
Appendix H: Trucker Interview Protocol .....	97
Appendix I: Polytechnic of Namibia – HIV/AIDS Interview .....	98
Appendix J: WBCG HIV/AIDS Help Desk Interview Protocol.....	99
Appendix K: Petrol Station Interview Protocol .....	100
Appendix L: Security Company Interview Protocol .....	101
Appendix M: Service Station Information Request Letter .....	102
Appendix N: The Road Traffic and Transport Regulations.....	103
Appendix O: Windhoek Truckport Interview Protocol .....	105
Appendix P: Transport Company Email.....	106
Appendix Q: Van der Walt Transport Email .....	107
Appendix R: Cool Ideas Truck Stop Email .....	108
Appendix S: Complete Service Station List in Identified Towns.....	109
Appendix T: Service Station Map.....	110
Appendix U: Service Station List .....	111
Appendix V: Namport Information Request Email .....	116
Appendix W: Roads Authority Email.....	117
Appendix X: Van der Walt Transport Interview Results.....	118
Appendix Y: Van der Walt Email Conversation Results.....	121
Appendix Z: Wesbank Transport Interview Results.....	122
Appendix AA: Polytechnic Social worker Interview Results.....	124
Appendix BB: WBCG HIV/AIDS Help Desk Interview Results.....	125
Appendix CC: G4S Interview Results .....	128
Appendix DD: Cool Ideas Truck Stop Email Results .....	130
Appendix EE: Windhoek Truckport Interview Results .....	132
Appendix FF: SADC Cargo Shipped in 2008 .....	134
Appendix GG: SADC Cargo Landed in 2008 .....	136
Appendix HH: Secondary Truck Stop Layout Drawings .....	138
Appendix II: Full-Service Truck Stop Layout Drawings .....	139

## TABLE OF FIGURES

Figure 1 - Truck crashes by distance from previous rest area .....	8
Figure 2 - Inward Orientation and Outward Orientation .....	12
Figure 3 - Trucks plugged into IdleAire .....	13
Figure 4 - Map of Walvis Bay Corridors .....	20
Figure 5 - Windhoek Truck Port.....	21
Figure 6 - Take-away area at the Windhoek Truckport.....	26
Figure 7 - Trucks parked along the roads in Oshikango.....	27
Figure 8 - Windhoek Truckport Parking Area.....	37
Figure 9 - Hypothetical Frequency of Health Services Use by Truck Drivers in Namibia.....	39
Figure 10 - Health Issues for Truck Drivers .....	40
Figure 11 - Frequency of Take-Away Use by Truck Drivers in Namibia.....	40
Figure 12 - Frequency of Restaurant Use by Truck Drivers in Namibia.....	41
Figure 13 - Hypothetical Frequency of Take-Away/Convenience Store Use .....	42
Figure 14 - Hypothetical Frequency of Bed & Breakfast Use.....	43
Figure 15 - Would truck drivers sleep in their trucks regardless of security?.....	43
Figure 16 - Trucks pumping diesel fuel at the Windhoek Truckport .....	44
Figure 17 - Frequency of Refueling by Truck Drivers in Namibia .....	45
Figure 18 - Frequency of Toilet Use by Truck Drivers in Namibia .....	45
Figure 19 - Hypothetical Frequency of Shower Use by Truck Drivers in Namibia.....	46
Figure 20 - Showers at the Windhoek Truckport.....	46
Figure 21 - Repair garage at Swakop Engen Truck Port .....	47
Figure 22 - Frequency of Maintenance Garage Use by Truck Drivers in Namibia.....	48
Figure 23 - Frequency of ATM Use by Truck Drivers in Namibia.....	49
Figure 24 - Frequency of Payphone Use by Truck Drivers in Namibia .....	50
Figure 25 - Hypothetical Use of Leisure & Entertainment Facilities .....	51
Figure 26 - Frequency of Hypothetical Internet Use by Truck Drivers in Namibia.....	52
Figure 27 - Secondary truck stop site plan.....	53
Figure 28 - Full-service border location truck stop site plan .....	54
Figure 29 - Shipment Destinations by Corridor for Truck Drivers in Walvis Bay.....	56
Figure 30 - Corridor Stop Locations by Drivers Surveyed in Walvis Bay.....	57
Figure 31 - Continuous Driving Hours by Truck Drivers in Namibia.....	58
Figure 32 - Map of Pre-determined Locations.....	59

Figure 33 - Top Delivery Locations by Truck Drivers ..... 61  
Figure 34 - Trucks parked on the side of the road in Oshikango..... 61  
Figure 35 - Map for Additional Truck Stops ..... 62  
Figure 36 - Top Stopping Locations by Truck Drivers..... 63  
Figure 37 - Map of all identified locations ..... 68

## TABLE OF TABLES

Table 1 - U.S. and Canada rest area spacing survey results .....	7
Table 2 - Other treatable ailments in Namibia.....	18
Table 3 - Feasibility of Service Station Expansion.....	32
Table 4 - Feasibility Analysis of Otjiwarongo Service Stations.....	64
Table 5 - Feasibility Analysis of Tsumeb Service Stations .....	65
Table 6 - Feasibility Analysis of Katima Mulilo Service Stations .....	65
Table 7 - Feasibility Analysis of Rundu Service Stations .....	66
Table 8 - Feasibility of Service Station Expansion.....	71

## EXECUTIVE SUMMARY

Namibia currently imports and exports many goods through the Port of Walvis Bay, which is the shipping transportation hub of the country. Deliveries travel to and from the port to destinations throughout the South African Development Community (SADC) region. The highways leading to and from the port, called the Walvis Bay Corridors, are used by trucks to carry cargo being shipped through the port. With a dramatic port expansion plan to be completed in 2012, truck traffic along the Walvis Bay Corridors is likely to increase. Improvements to the transportation infrastructure are needed to accompany this increase, as transportation infrastructure is of key importance to the economic and social development of a country. However, these corridors are currently unsafe for drivers in certain locations where thefts frequently occur. One way to significantly improve the infrastructure and create a safe environment for drivers would be to install truck stops at strategic locations along these routes.

The goal of our project, sponsored by the Walvis Bay Corridor Group (WBCG), was to determine what services should be available for truck drivers along Namibia's northern corridors, recommend potential locations that would be best for installation of these services, establish a means by which to analyze the expansion capacity of service stations, and outline the benefits of a truck stop system. We were also tasked to develop a model for the future layout of truck stops to provide the WBCG with a deliverable that they can use to plan these truck stops.

The methods we used to gather information regarding the current infrastructure and the potential future infrastructure involved interviews with transport company officials, security company representatives, truck port and truck stop owners, truck drivers, and various other sources. We also conducted a survey of truck drivers in which we sampled drivers in Walvis Bay, Oshikango, Gobabis, and Windhoek, in order to develop an understanding of

their driving and resting patterns. We then analyzed this information to determine potential locations for new truck stop facilities and the services that should be provided.

During our interviews with truck drivers, we learned that sometimes only stop to rest when they finally reach their destinations. These drivers may only stop for any significant duration of time if they reach a border or if the law requires them to do so, as it soon will. Thus, we concluded that it would be ineffective to provide every service at every new truck stop. We developed basic guidelines to determine which services should be provided at each location. From our survey results, we determined that full-service border truck stops should feature the following services:

- |                      |                       |                     |
|----------------------|-----------------------|---------------------|
| 1. Showers           | 5. Diesel Fuel        | 9. Banking (ATMs)   |
| 2. Toilets           | 6. Maintenance garage | 10. Restaurant      |
| 3. Take-away         | 7. Leisure facilities | 11. Bed & breakfast |
| 4. Convenience store | 8. Wellness Centre    | 12. Payphones       |

All truck stops should be required to have secured parking areas as well. Secondary truck stops in lower traffic areas need not feature full-scale wellness centres, leisure facilities, bed & breakfasts, and restaurants, because these are more likely to be short term stops with less traffic flow.

We focused on the northern corridors of Namibia because they are less developed than the well-established southern corridors that have long been used to deliver to South Africa. From the results of our survey, we identified Otjiwarongo, Tsumeb, Gobabis, Rundu, and Windhoek as effective locations for secondary truck stops in addition to the more highly trafficked locations of Walvis Bay, Oshikango, and Katima Mulilo for full-service border truck stops.

This report identifies what should go into a truck stop, where truck stops should be located, and the benefits to truck drivers, transport companies, and the funders of new truck

stops. We hope that the research and analysis provided in this report will help the WBCG improve the transportation infrastructure of Namibia and other countries in the SADC region.

## 1. INTRODUCTION

Transportation infrastructure is of key importance in the economic and social development of a country. This infrastructure is comprised of roads, railroads, airports, and shipping routes that promote the economy through the transportation of goods and people. This is important because one measure of the wealth of a nation is the value of trade across its borders. Unfortunately, the lack of a complete and efficient transportation infrastructure in many developing countries has inhibited their overall economic and social growth. History has shown, for example, that as the early United States expanded its transportation infrastructure and created well-developed routes to other parts of the continent, its role as an economic superpower began to emerge. Many less developed countries have been unable to expand their infrastructure in a manner similar to that of the United States. This inability to progress is most often due to political turmoil, financial constraints, and inefficient technology.

Currently, Namibia's Port of Walvis Bay is one of the most reliable ports in southern Africa. This is where many of the imports and exports between parts of southern Africa and the rest of the world take place. The Namibian Port Authority (Namport) strives to make the Port of Walvis Bay one of the most important goods transportation facilitators in the SADC (South African Development Community) region. There are high hopes for the port's growth potential, as approximately 150 trucks currently drive through the port each day (LeBeau, 2006, p. 7). After expansion of the port is completed within the next few years, the Port of Walvis Bay will be able to simultaneously load and unload fourteen ships rather than the current nine ship capacity. The Walvis Bay Corridor Group (WBCG) has realized that in order to make the Port of Walvis Bay an industry leader, it must have reliable transportation infrastructure not only at the port, but along all of the corridors used to transport the goods

that go through the port. As a result of the WBCG's efforts, numerous improvements have already been made to Namibia's road transportation infrastructure. Recent improvements to the corridors include the construction of a new bridge across the Zambezi River into Zambia and the reopening of the Trans-Caprivi highway in 2003 (LeBeau, 2006, p. 7). If the corridors are safer and more accessible, then more goods will be shipped through Walvis Bay. One way to increase the drivability of these corridors is to install truck stops at the main borders and at other key locations. Currently, there are only service stations with limited facilities where drivers can stop to get fuel, and even these are limited in number. To remedy this, the WBCG is looking for an installation plan for full-service truck stops along the corridors leading into and out of the Port of Walvis Bay. For the scope of this project, we focused only on the northern corridors, which are less-developed than the southern corridors, which have long been used to deliver to South Africa.

Information about truck stops is available for other countries, but little information has been gathered for Namibia. Current literature describes small truck ports in some towns in Namibia, which only feature certain basic services such as fuel, limited parking, and take-away food (LeBeau, 2006, p. 42). These truck ports would be considered little more than typical service stations in the United States. Other services, such as food, lodging, and health care, are not yet offered at truck stops in Namibia. Research on South Africa, however, has indicated that the Maputo Corridor Logistics Initiative (2009) has begun to introduce truck stops featuring services such as safe parking, truck washes, restaurants, toilets and showers, laundry, and a 24-hour diesel facility.

Since there are no full-service truck stops in Namibia as there are in more developed countries, drivers have to stop at multiple locations to sleep, eat a full meal, shower, or get general health care services when traveling long distances. This lack of amenities makes Namibia's corridors difficult to travel due to the long distances between urban settlements.

In order to effectively plan truck stops that will better aid drivers, it is important to understand current truck driver behavior patterns to identify which services should be available and where it would be most effective to make them available.

The goal of this project was to identify what services—such as parking, health care, food, rest, and communication—are necessary at truck stops along Namibia’s main corridors. We surveyed and interviewed truck drivers in Namibia who travel long distances on the Walvis Bay Corridors to determine specifically what amenities they want or need when driving. We also interviewed transport company officials, current service providers, owners of current truck port and truck stop facilities, and utility company officials. The project also assessed which existing service stations along the corridors could be expanded into truck stops using studies of truck driver stopping and resting patterns, such as how long they travel before stopping and where they stop. By utilizing the information in this report, the WBCG should be able to persuade potential funders to invest in truck stops to improve the infrastructure of the Walvis Bay Corridors.

## **2. BACKGROUND**

Creating an implementation plan for truck stops involves numerous considerations, from planning the location placement based on existing infrastructure, to planning the numerous amenities and their layout within the facility. Current literature about these topics will be discussed in this chapter. This report will refer to these sites as truck stops, although they are intended to also be accessible to motorists other than truck drivers, such as local travelers and international tourists. However, we will frequently cite references about sites that are not explicitly intended to be just for truck drivers, and in those instances the terminology of the original source must be used, such as rest area or truck parking bay. In this report, we define truck stops as those service areas meant to fulfill the basic needs of both commercial truck drivers and ordinary travelers alike without them having to stray far from the highways.

In Namibia, there are currently places where truck drivers can purchase fuel, but no full-service truck stops exist (Mossakowski, 2009, p. 5). In order to address this issue and install truck stops, it is important to understand how they are typically introduced. This chapter will discuss how the services, locations, and planning of truck stops has occurred elsewhere around the world and what challenges lie ahead for doing so in Namibia.

### **2.1 HISTORY OF TRUCK STOPS IN THE UNITED STATES**

In the United States, truck stops and rest areas have become an important feature of the highway system. Drivers have become accustomed to seeing them at periodic intervals as they travel along interstate highways. Though many motorists take these areas for granted in the United States, the situation is different in Namibia.

In the United States, government action spurred the growth and proliferation of truck stops to new levels via the Interstate Highway Act of 1956 (Fowler, 1987, p. 1). The act

served as a catalyst for the expansion of the interstate system and the services along these roads, refining earlier legislation by apportioning funds among the states and setting the federal government's share of the project costs at 90 percent (Federal Highway Administration, 2009). As similar legislation has not been passed in Namibia, the Walvis Bay Corridor Group is now taking the initiative to address the need for service facilities along major highways.

## **2.2 BENEFITS OF TRUCK STOP INSTALLATION**

The installation of truck stops has the potential to yield significant benefits to numerous stakeholders. They result in a stronger backbone for the transportation of goods by providing truck drivers with services they need while driving. They can also result in significant economic benefits both for financial stakeholders as well as the local municipalities in which truck stops are constructed.

In a report conducted for the Montana Department of Transportation regarding Montana's rest areas, Blomquist and Carson (2005, p. 15) corroborated the idea that rest areas can be beneficial to the economy. The report suggested that in addition to increased highway safety by giving fatigued drivers a place to rest, enhancing rest area infrastructure also provided economic contributions to the state.

South Africa is currently engaged in a project to expand infrastructure with the Maputo Development Corridor Project (Makapela, 2008). The project aims to "unleash economic development while growing the regional economy" (South Africa). Among the project's services are a tourism information centre and truck stops and rest areas along the N4 Corridor.

## 2.3 PLACEMENT PLANNING

There are many factors that must be taken into consideration when planning the placement of truck stops. Any plan must take into account factors such as the intervals between each stop and nearby settlements and their existing infrastructure.

### 2.3.1 SPACING INTERVALS

Truck stops must be placed at intervals that maximize the efficiency and effectiveness of the services they offer. A study conducted by Fowler (1987, p. 2) for the Texas Department of Highways and Public Transportation stated that the recommended rest area spacing is 50 to 60 miles (80 to 96 kilometers) based on reviews of other states and interviews with Texas travelers. Another study for the Montana Department of Transportation recommended spacing of approximately one hour of travel time (Blomquist & Carson, 2004, p. 14). The same study also cited a report by the American Association of State Highway and Transportation Officials (1999) that recommended that the posted speed limit be used as an approximate distance between rest stops<sup>1</sup>.

Organizations in other countries feature similar recommendations for their truck stops. According to the National Territory Transport Group (2007), Australian truck parking bays should be spaced at approximately 80 km (50 miles) intervals, accounting for local towns and other nearby facilities. The National Transport Commission (2005, p. 26) recommended even smaller intervals for truck parking bays of just 30 km (19 miles), though these parking bays are typically just parking areas with trash cans. The National Transport Commission stated that current policies recommend that the full-featured rest areas be placed at intervals of 80 km to 110 km in most areas, with longer ranges in more remote areas, such as 160 km to 240 km for remote rural areas of Western Australia (p. 18). The report stated that Australian recommendations are consistent with United States guidelines (p. 27).

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<sup>1</sup> The posted speed limit on most highways in the United States is 55-65 mph, or about 90-105 km/h.

Judging by these figures, truck stop intervals appear to approach a commonly accepted average, even in fairly rural places like the Australian outback.

Blomquist and Carson (2005, p. 15) surveyed knowledgeable rest area officials in the United States and some Canadian provinces and found that the desired rest area spacing was actually very close to the actual average spacing of about 53 miles. The results of their survey are shown in Table 1 below.

**Table 1 - U.S. and Canada rest area spacing survey results (Blomquist & Carson, 2004, p. 15)**

<b>What is your current and desirable average rest area spacing?</b>	<b>Current</b>	<b>Desirable</b>
Average (Miles)	52.84	54.26
Minimum (Miles)	25.00	20.00
Maximum (Miles)	140.00	95.00
Average (Hours)	1.09	1.08
Minimum (Hours)	0.50	0.50
Maximum (Hours)	3.00	1.50

Despite data indicating that some rest areas are as far as 140 miles (225 km) apart, it appears that rest areas should ideally be much closer together than that. A study of all rural Minnesota interstate freeway segments showed a marked increase in the incidence of single-vehicle truck crashes when the distance between rest areas exceeded 70 miles (113 km), as shown in Figure 1 below (Morris, 2005, p. 30). Note that the last interval displayed on the

graph contains a typographical error; it should read 75-80 miles rather than 70-75 miles.

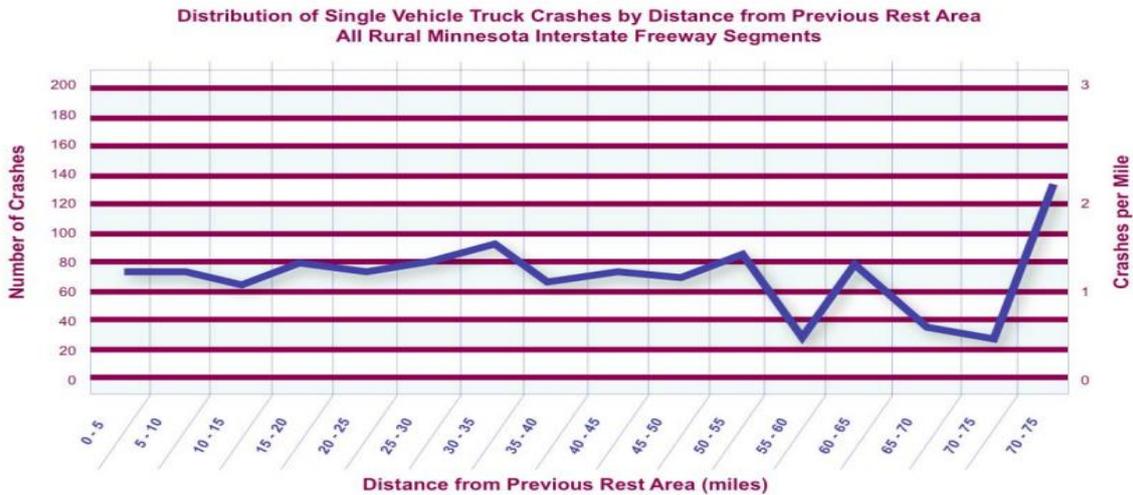


Figure 1 - Truck crashes by distance from previous rest area (Morris, 2005, p. 30)

The relatively low-volume traffic through some of the Namibian corridors would seem to be a reason to increase the interval distance between stops, but the low-volume nature of roads actually lends itself to requiring more frequent stops for rest. The aforementioned Minnesotan interstate study (Morris, 2005, p. 36) suggested that there is a strong correlation between lower-volume roads and crashes related to fatigued drivers. One review of countermeasures to driver fatigue, conducted for the Centre for Sleep Research at the University of South Australia by Fletcher (2005), stated that the extent of fatigue as a contributor to vehicle crashes ranges from 10-40%, depending upon the source of the information (p. 471). The danger of fatigued drivers is underestimated compared to other factors like alcohol intoxication, yet research shows that fatigue and alcohol risk are broadly comparable in drivers. The only way to minimize fatigue-related crashes is to ensure drivers get enough sleep and avoid extended periods of wakefulness. Keeping all of the above considerations in mind, the maximum interval between stopping areas should likely be less than 70 miles (113 km) whenever possible.

### 2.3.2 NEARBY SETTLEMENTS

The National Transport Commission (2005, p. 28) suggested strategically placing Australian rest areas in order to promote the use of town facilities where possible on a given route. The recommended spacing distance between a township and the nearest truck parking bay is 20-30 km (12-19 miles) when traffic volume justifies a parking bay outside of the township.

The placement should also allow for adequate space for the stops to expand should the need arise without encroaching upon residential areas. Fowler (1987, p. 2) recommended a buffer zone be maintained between any nearby communities and the rest areas to prevent problems such as noise disturbance for nearby residents. The report also recommended acquiring surrounding land if the rest area is close enough to a community that the buffer zone might be disturbed within 20 years.

One factor that must be considered when planning the placement of truck stops is the effect it will have on the local town based on its location within the town. When placed effectively, truck stops can make a very positive impact. In an article titled “Engen Truck Port changes Swakop skyline”, author Donna Collins (2008) described the new N\$24 million Swakop Engen Truck Port facility that was hailed for the improvements it brought to the town of Swakopmund. The mayor, Germina Shitaleni, described the facility as having enhanced the overall appearance of the town and preserved its sustainable beauty. The truck port, located at the eastern entrance to the town just on the outskirts, keeps trucks parked outside of the town, while creating employment and beautifying the town’s entrance with a “diverse and lively truck port” (p. 1).

These placement factors will have to be adjusted to fit with the needs of Namibia and its travelers. The placement of a truck stop at the outermost edge of an urban area works well for Swakopmund, Namibia, and it may work for other Namibian urban settlements (Collins,

2008). It will be important to strike a balance between having a buffer zone around residential areas and having the truck stops so far away that people employed at them would have to travel great distances to get there. This is a special concern in Namibia and other less-developed countries where many people have very limited incomes and therefore may not have the means to travel long distances to work.

## **2.4 AMENITIES**

Certain amenities are necessary for any truck stop to effectively service the needs of truck drivers and other motorists. In most cases, these services include food, fuel, rest, leisure and entertainment, communications, and other miscellaneous services. These services are of varying levels of importance, and some lower volume truck stops may not feature all of them. An effective combination of services must be chosen to maximize the utility and minimize the construction and operating costs of each site.

### **2.4.1 FOOD**

Truck stops should always have food and water available. The four main truck stop companies in the United States—Flying J, Petro, Pilot, and TravelCenters of America (TA)—offer varying levels of food service (Ray, 2007). While Pilot truck stops generally only offer fast food, the other three companies' stops typically offer buffet and full-service menu dining in addition to fast food offerings. Because a growing number of truck stops in the United States only feature fast food, drivers are beginning to invest more in coolers and microwaves in their trucks to be able to prepare their own meals.

The Maputo Corridor Logistics Initiative (2009), a South African company that promotes the use of South Africa's Maputo Corridor, recently opened a new truck stop on that corridor. This truck stop features a kiosk and a restaurant that serves three meals per day and can accommodate up to 100 people at once.

## 2.4.2 FUEL

Fueling stations are an essential feature at truck stops. President of Truck Stop Consultants Gary Hall (personal communication, February 20, 2009) said that one in three truck drivers stopping at truck stops will purchase fuel. In South Africa, the Maputo Corridor Logistics Initiative's (2009) Cool Ideas Truck Stop features 24-hour diesel fuel pumps.

## 2.4.3 PARKING

Parking, an obvious feature of any truck stop, is one that requires careful planning based on current and future traffic counts (G. Hall, personal communication, February 20, 2009). Truck stops located on corridors with a high traffic volume must feature more than enough parking for not only the current traffic but also for increased future traffic that will inevitably arise as a result of transportation infrastructure expansion and economic growth in general. In some highly-trafficked areas in the United States, this basic feature has not been sufficiently provisioned, which has led to safety concerns such as parking on the roadways.

The Wall Street Journal (Matthews, 2007) reported that large tractor trailer trucks often line the shoulders of interstate highways leading into major U.S. cities at night. This occurs near cities like New York, Los Angeles, Chicago, and Baltimore, where truck drivers often cannot find parking at nearby truck stops that are already overcrowded with big rigs. Sometimes all truck drivers can do is park on an exit or entrance ramp. A study of Minnesota interstates (Morris, 2005, p. 39) showed that single-vehicle truck crash rates for fatigued drivers increase when rest areas are filled to capacity during night hours. This is a dangerous situation which should be avoided with careful planning and land provisioning for the parking area.

Fowler (1987, p. 3) recommended splitting parking areas such that large tractor trailer trucks are separated from smaller passenger vehicles. This allows for larger parking spaces for large vehicles, and it will ensure that these large vehicles do not hit smaller ones as a

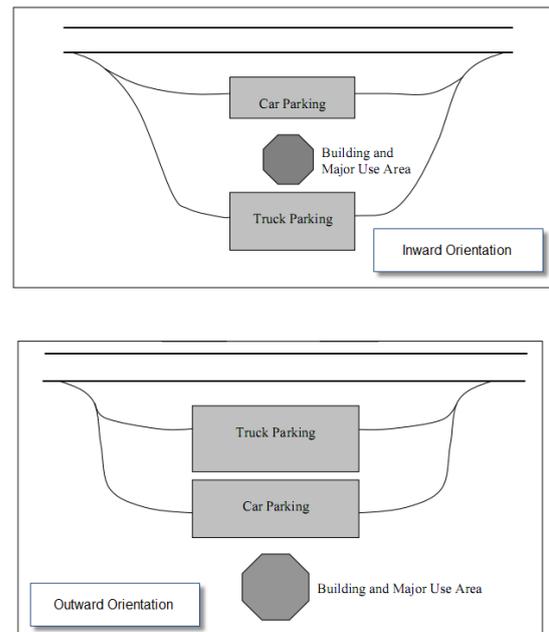
result of being unable to see them. According to a study for the Montana Department of Transportation (Blomquist & Carson, 2005, p. 36), in areas in which site space is not an issue, an “inward orientation” site design makes the best use of land. An inward design places the central building in between the car parking and truck parking areas, in order to place both parking areas close to the facilities. See Figure 2 for both parking orientations.

Blomquist and Carson (2005, p. 36) recommended long entrance and exit ramps into rest areas when they are located immediately off a high-speed road. This recommendation is made for two reasons. The first reason is that long ramps should provide a buffer of 10 to 50 meters between the nearest parking area and the highway in order to discourage motorists from parking on the shoulders. The second is that they allow for longer acceleration and deceleration paths, which is of particular importance to heavy trucks.

The previously mentioned truck stop created by the Maputo Corridor Logistics Initiative (2009) features a secure gravel parking area for up to 130 trucks concurrently, and the facility takes responsibility for thefts that occur from trucks in the parking area.

#### 2.4.4 PARKED SERVICES

Parking is generally free at truck stops, but there is a creative way to monetize tractor trailer parking that is beneficial to both truck drivers and truck stop owners alike. Often when truck drivers take one of their rest periods, they leave their engines idling in order to provide heating or cooling to both the cabin and the trailer as well as to keep the engine warm



**Figure 2 - Inward Orientation (above) and Outward Orientation (below) (Blomquist & Carson, 2005, p. 36)**

and battery charged (U.S. Department of Energy, 2007b). In the United States alone, the idling of large tractor trailer trucks results in the consumption of 838 million gallons of fuel every year. Adding light- and medium-duty vehicles, such as busses, to this figure increases the total to almost 3 billion gallons. Truck stop electrification systems are one way to reduce fuel consumption and emissions from idling trucks. Truck stop electrification is a form of idle reduction technology which provides stations to which trucks can connect to provide electricity to power heating and cooling equipment without leaving the engine idling.

Truck stop electrification systems have benefits for everyone involved (U.S. Department of Energy, 2007a). First and foremost, they save fuel and money for truck drivers and their respective transport companies. Although truck stops can and should charge for



**Figure 3 - Trucks plugged into IdleAire (2008)**

electrification service, the charge is typically less than the cost of the fuel that would have been burned while idling. This means that truck drivers save money and truck stops make money. At a truck stop in New Jersey, truck drivers can plug into IdleAire, one such idle reduction service in the United States, for US\$10 for an overnight stay (Santi, 2007).

IdleAire (2008) provides electricity, heating and cooling, a touch-screen computer for internet access, a phone line, and a coaxial television connection. The cost of diesel burned while idling for 10 hours would be around US\$30 (Santi, 2007). Additionally, these services also benefit public health and the environment by eliminating harmful idle-related emissions and pollutants (U.S. Department of Energy, 2007a). There is also significant benefit to the surrounding areas, as the noise pollution from these truck stops can be greatly reduced by turning trucks off. The only retrofit required by a truck to use IdleAire (2008) is a US\$10 window adapter.

#### **2.4.5 LEISURE & ENTERTAINMENT**

Petro truck stops (2009) in the United States pride themselves on their leisure facilities, which include 24-hour free movie theaters, video arcades, television rooms, and DVD sales. Some truck stops take this a step further, offering in-cab television services for truck drivers via IdleAire (2008), which was described in more depth in the previous section. IdleAire provides a coaxial connection directly into the window of trucks, to which truck drivers can connect their own televisions. Many truck stops have a lounge area with a television, such as the Cool Ideas Truck Stop (Maputo Corridor Logistics Initiative, 2009) in South Africa which features DSTV.

#### **2.4.6 INFORMATION SERVICES**

The ability to communicate information with the outside world from truck stops is of great importance, particularly in cases of emergency. Motorists must have access to telephones, particularly in areas with little or no cellular phone coverage. Sufficient telephone services at highway rest stops were ranked of 10<sup>th</sup> importance out of 35 potential rest area amenities in Montana (Blomquist & Carson, 2005, p. 51). See Appendix D for a full compilation of the results of their survey. It is also important for information to be able to reach truck stops from outside. Motorists need to have access to up-to-date travel information in order to effectively plan their driving. Information services such as weather, road, and traffic conditions was ranked 9<sup>th</sup> on the aforementioned survey of most desired amenities (p. 52).

#### **2.4.7 LODGING**

Some truck stops feature in-house lodging services even though many truck drivers sleep in their trucks. In the United States, TravelCenters of America (2009) truck stops feature several branded lodging services including popular brands like Days Inn and Motel 8. Similarly in Australia, rest areas such as Hells Gate Roadhouse (2007) offer motel service as

well as additional camping-related services for tourists. These services are targeted towards higher-volume rest areas than might be the case in Namibia.

#### **2.4.8 MISCELLANEOUS SERVICES**

There are numerous amenities that are very important, but do not take up much space, may not generate any revenue for the truck stop, and do not cost much to install or operate. These factors may cause these amenities to be overlooked. Among these are trash cans, toilets, and ATMs.

On a survey conducted during a study of Montana rest areas, users ranked trash cans number one among the 35 amenities on the survey (Blomquist & Carson, 2005, p. 44). Such a basic amenity would generally be beyond mentioning in the scope of this project, but it seems to be noteworthy since users recognized it as being of chief importance. Both Fowler (1987, p. 2) and Blomquist and Carson (2005, p. 51) recommended using cement or concrete trash cans for this purpose as they are difficult to remove maliciously or vandalize.

Toilet facilities at truck stops must be of sufficient size to accommodate the flow of people through the stop. The American Association of State Highway and Transportation Officials provides a formula for estimating the number of toilet stalls based on human traffic volume through each rest area (Blomquist & Carson, 2005, p. 45). A survey of Montana rest stops found that the primary purpose for stopping was usually to use toilets (Blomquist & Carson, 1998, p. 25). In addition to toilet stalls, shower services are a requirement for truck drivers who travel on multiple day journeys (G. Hall, personal communication, February 20, 2009). The Cool Ideas Truck Stop (Maputo Corridor Logistics Initiative, 2009) features eight toilets and eight showers for its truck drivers.

Having appropriate banking services where possible is also of significant importance, particularly if motorists are to be paying for amenities. Having approved methods of

payment is crucial (G. Hall, personal communication, February 20, 2009). Installing ATMs at truck stops may be recommended at locations where it is feasible.

## **2.5 HEALTH SERVICES**

Many of the diseases that affect the people of developing countries, such as Namibia, are treatable and preventable. Some, such as HIV/AIDS, are preventable through education, though after infection they can be managed with medications. Due to the nature and prevalence of infectious diseases in southern Africa, it may be important to include any facilities and medications necessary to treat these diseases at truck stops in Namibia.

### **2.5.1 HIV/AIDS**

One substantial health problem in southern Africa is the Human Immunodeficiency Virus (HIV) and the resultant Acquired Immune Deficiency Syndrome (AIDS). Roughly 21% of the adult population of Namibia is infected with the virus, most of whom live outside of the larger cities (Bililies, 2008, p. 6). Numerous studies show that mobile populations such as truck drivers play an important role in the spread of HIV infection (Bronfman, 2002, p. 476). The same idea is confirmed by Orubuloye (1993, p. 43), who calls truck driving a high-risk occupation for the spread of AIDS. The most immediate reason behind this concentration of HIV among truck drivers is the lack of knowledge about the virus (Bronfman, 2002, p. 476).

One study, designed to evaluate the impact of an intervention to disseminate information regarding STD/HIV/AIDS and to promote condom use among a group of truck drivers in Mexico, showed that the truck drivers who had the intervention were more likely to understand the implications of HIV and the use of condoms (Bronfman, 2002, p. 477). However, this approach to information dissemination may be problematic in Namibia, as

people are extremely sensitive about discussing HIV, the use of condoms, and related practices, due to the large social stigma attached to being HIV positive (Bililies, 2008, p. 7).

Arrive Alive South Africa (2009), a web site which aims to develop an effective road safety information portal, wrote that South African truck stops can be an important part of the strategy to protect truck drivers against HIV/AIDS and other illnesses by providing information on the risks truck drivers may face. This approach is already in use in South Africa, where some truck stops feature free condoms and counseling (Health Ezempilo, 2004). Arrive Alive (2009) reported that modern South African truck stops feature a medical facility and medical care which provides an opportunity for truck drivers to get tested for HIV/AIDS and diabetes, as well as to have their eyes checked.

### 2.5.2 MALARIA

Malaria poses a significant problem for truck drivers and other travelers alike. Truck drivers frequently travel through malarial zones on their routes, and their mobility can spread the parasite that causes the disease. If a truck driver gets bitten by a mosquito carrying the malaria parasite, he can transfer the parasite to another person by getting bitten again by an appropriate mosquito. The disease begins with a primary attack which features symptoms of malaise, anorexia, headache, myalgia, and low-grade fever. Over time the disease progresses to the paroxysm stage where the infected individual will have sudden violent attacks at regular intervals depending on the type of malaria parasite. The symptoms of these paroxysms are chills, fever, and sweating accompanied by nausea, vomiting, and diarrhea (Ruebush, 1986, p. 455). The problems caused by malaria make it clear that this could be a serious problem for truck drivers as they would be unable to do their job effectively, if at all, if they were to contract malaria.

Prior to malarial infection, most methods of controlling the spread of the disease generally involve controlling mosquitoes (Ruebush, 1986, p. 462). As this has not yet solved

the malaria problem, truck stops might be able to provide mosquito nets and insect repellent to ward off mosquitoes.

### 2.5.3 OTHER TREATABLE DISEASES

There are a variety of other diseases that are less common that can also be hazards in southern Africa. They include schistosomiasis, onchocerciasis (river blindness), dengue fever, filariasis, trypanosomiasis (African sleeping sickness), and rickettsial infections (Health Information for Travelers to Namibia, 2009). Table 2 presents these illnesses with their causes and symptoms. It may be feasible to offer treatment for some of these common diseases at major truck stops.

**Table 2 - Other treatable ailments in Namibia (Health Information for Travelers to Namibia, 2009)**

<b>Ailment</b>	<b>Cause</b>	<b>Symptoms</b>
Schistosomiasis	Parasites in fresh water	Rashes, fever, weakness, headaches
Onchocerciasis (river blindness)	Filarial nematode transmitted by black fly bites	Blindness
Dengue fever	Aedes mosquito bites	High fevers, headaches, joint pain
Filariasis	Worm parasites in lymphatic vessels	Swelling of lymphatic vessels
Trypanosomiasis (African sleeping sickness)	Parasite transferred through tsetse fly bite	Fever rash, severe meningoencephalitis
Rickettsial infections	Various microorganisms	Fever, headache

### 2.5.4 GENERAL HEALTH CARE

Other risks that threaten truck drivers and other mobile populations are simple health care issues, such as the common cold and random cuts and injuries. For this, over-the-counter medication and first aid could be made available at rest stops. Another important safety precaution that could be available is sunscreen. Due to the intense heat and sun in southern Africa, skin cancer is a constant threat, and prevention methods should be available.

To go along with this, other services such as cholesterol level and blood pressure testing could be available to promote the health and safety of truck drivers (Bililies, 2008).

## 2.6 TECHNICAL GUIDELINES

Certain technical specifications should be followed in building truck stops. Major specifications such as site size will need to be considered as well as other building guidelines such as site lighting, as truck stops pose unique challenges and opportunities due to their sometimes remote locations and small traffic volume along some of the routes.

### 2.6.1 SITE GUIDELINES

According to Fowler (1987), the “absolute minimum” land allotment for a truck stop is 10 acres (4 hectares<sup>2</sup>) (p. 2). The ideal site, he says, is one comprised of a relatively square 20 to 30 acres (8 to 12 hectares) in order to facilitate efficient layout of all services and the parking areas. The area should have sufficient open space to avoid the perception of overcrowding.

It is also very important to ensure that the entire area has a sufficient level of illumination. Extensive lighting will help to ensure that everyone can feel safe at these truck stops from people with malicious intent and from other hazards. The Montana rest area user survey asked respondents if they felt “very” safe, “somewhat” safe, or “not at all” safe at rest areas after dark and found that about one third of respondents reported feeling only somewhat safe (Blomquist & Carson, 2005, p. 56). It is noteworthy, however, that many respondents did not answer this question at all, possibly skewing the results. The same survey found that lighting for the parking areas and pathways was the second most important amenity out of 35 surveyed services (p. 48). Extensive lighting will deter crime by keeping the entire site visible, allowing motorists to feel secure using the truck stop’s services.

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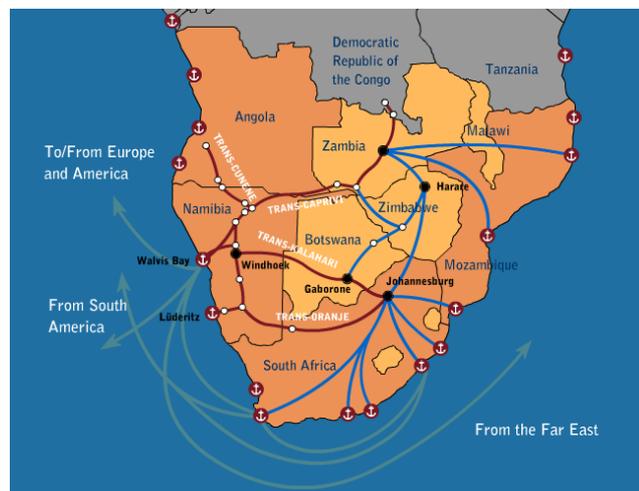
<sup>2</sup> 1 hectare = 10,000 m<sup>2</sup>

## 2.7 SITUATION IN NAMIBIA

In order to evaluate the installation of truck stops along the Walvis Bay Corridors, it is necessary to understand the current state of infrastructure and other elements regarding truck driving and the transportation industry in general. The topics we discuss in this section are the Namibian road systems, existing infrastructure for truck drivers, the Port of Walvis Bay, and Namibian driving laws.

### 2.7.1 THE CORRIDORS

The corridors in Namibia are the highways that help to connect Namibia's ports to many different destinations in southern Africa (see Figure 4). The four corridors in Namibia are the Trans-Kalahari Corridor, the Trans-Caprivi Corridor, the Trans-Cunene Corridor, and the Trans-Oranje Corridor. The Walvis Bay Corridor Group (2009) reported that the



**Figure 4 - Map of Walvis Bay Corridors (Walvis Bay Corridor Group, 2009)**

Trans-Kalahari Corridor is a 1900 km long tarred road that was established in 1998. This corridor connects the Walvis Bay Port with Windhoek, Gaborone in Botswana, and Johannesburg in South Africa. The Trans-Caprivi Corridor was built in 1999 to connect Walvis Bay with northern Namibia and Angola and subsequently extended to connect with Zambia and the Democratic Republic of the Congo in 2004 after the completion of the Katima Mulilo Bridge. The Trans-Cunene Corridor links Walvis Bay to Ondangwa, Namibia and further into Lubango, Angola, a distance of 1600 km. The Trans-Oranje Corridor connects Namibia's ports in Walvis Bay and Lüderitz to Johannesburg via a 1700 km long tarred road that runs through South Africa.

## 2.7.2 EXISTING TRUCK PORTS

Currently, the most sophisticated services offered in Namibia for truck drivers are



**Figure 5 - Windhoek Truck Port (Mossakowski, 2009, p. 5)**

truck ports. These are essentially petrol stations with “special filling pumps for trucks that offer enough clearance for tall vehicles, enough space for the manoeuvring of trucks and have a higher fuel flow rate” (Mossakowski, 2009, p. 5). These truck ports

are still far from what would be considered a truck stop by United States standards. There are other issues with truck ports as well, such as safety, because they are typically not fenced in or monitored.

The Windhoek Truckport is fairly similar to a truck stop, though it still lacks many services, such as a health and wellness centre (p. 6). The Windhoek Truckport is unique, as they provide fenced parking and security guards.

Another truck port in Namibia is the Swakop Engen Truck Port, located at the entrance to Swakopmund (Collins, 2008). This truck port is comprised of Van der Walt Transport’s headquarters, an Engen service station, a Quickshop take-away, an auto and truck repair centre, a tyre centre, and a truck and car wash. Despite the fact that truck ports offer more services for truck drivers, they will still have to be upgraded so that a driver will be able to safely get everything he needs at one stop.

## 2.7.3 PORT OF WALVIS BAY

The Walvis Bay Corridor Group (2009) described the Port of Walvis Bay as the regional hub for central and southern Africa due to the port's location halfway down the western coast of Namibia, which gives it direct access to principal shipping routes in the region. It is capable of handling 2.5 million tons of bulk, containerized, frozen, and dry cargo annually (Namport, 2008b, p. 17). See Appendix E for a detailed report of the annual

shipping through the Port of Walvis Bay. The connection to the road corridors, rail networks, and air services allows the Port of Walvis Bay to effectively service the SADC region.

Namport has created an expansion plan for the Port of Walvis Bay to be completed by 2012. The plan is a result of their desire to make the port a regional hub for the SADC region and comes after opening offices in both Zambia and South Africa in an effort to better promote the port (Njini, 2008). The plan calls for the expansion of the container terminal, the bulk and breakbulk handling facility, the ship and rig repair yard, and the fishing industry quay (Namport, 2008a). The container terminal expansion will be a two phase process that involves the reclamation of land for the addition of five new berths. The first phase consists of expanding berths one through three and the addition of berth ten on the reclaimed land. The second phase will be the addition of berths eleven through fourteen. When completed, the terminal will have increased its capacity to over 500,000 TEUs (TEU, meaning twenty-foot equivalent units, are defined as the volume of a twenty-foot long shipping container). The bulk and breakbulk handling facility will be upgraded with the addition of a fluorite storage shed with a 20,000 tonne capacity. A 10,000 square meter warehouse will also be added for storage of break bulk cargo. The ship and rig repair yard will have a syncrolift that can handle vessels with a cargo capacity up to 2,000 tonnes and two floating docks that can handle vessels up to 8,000 tonnes. A new rig berth will also be constructed and will be capable of accommodating two semi-submersible rigs. The current fishing quay will be completely upgraded and a new cold storage facility with a capacity of 25,000 meters cubed will be constructed.

#### **2.7.4 FUTURE DRIVING LAWS**

The laws of Namibia play a role in truck stop development as well. In the Road Traffic Transport Regulations of 2001 (Republic of Namibia, 2001), Chapter 6, Part 2 states

that a lone driver can only drive a maximum of 5 hours without stopping and for a maximum of 14 hours in a 24 hour period. Additionally, when drivers rest, they must rest for:

- a minimum of 15 minutes at any one time;
- a minimum of 30 minutes accumulated over 5 hours and 30 minutes time;
- a minimum of 9 continuous hours in a 24 hour period

Although this section of the law is not currently in force, it will be yet another reason that truck drivers and other travelers will have to make use of new facilities once the law is enforced. This section of the law can be seen in more detail in Appendix N.

## **2.8 SUMMARY**

Implementation of truck stops in Namibia will pose many unique challenges due to the remote locations and relatively low volume of traffic flow along the corridors. This chapter covered many of the factors necessary for consideration in designing truck stops, from how to plan site placement and frequency to which services are typically offered at other facilities.

### **3. METHODOLOGY**

One goal of this project was to create a plan for the installation of new truck stops to be placed along the Walvis Bay Corridors in Namibia. In addition to these new truck stops, another goal was to create guidelines for the expansion and renovation of existing service stations into truck stops in other locations. To achieve these goals, we needed to develop a set of general recommendations for the new truck stops, identifying the most important features and services. Additionally, we needed to determine whether or not truck stops would be used by truck drivers and if they would be feasible. To assess this feasibility, we analyzed the need for truck stops and determined the types of benefits they would provide to truck drivers, transport companies, shipping companies, and the country as a whole.

#### **3.1 DETERMINING TRUCK STOP FEATURES**

We created a list of services that truck stops should feature ranked in order of decreasing importance by collecting data from several different sources. This list indicates which services are necessary and those which are supplementary. Our information sources included interviews with transport company officials and health services representatives as well as interviews with and a survey of truck drivers.

##### **3.1.1 SURVEY OF TRUCK DRIVERS**

We conducted a survey of truck drivers at various sites in Namibia to acquire information regarding how frequently drivers currently need to stop and how often drivers use existing services. We also asked hypothetically how frequently they would use additional services if they were to be made available at new truck stops. To get basic background characteristics of each driver's behavior, we gathered information about the average length of their trips and to which destinations they ship most often. The method we used to obtain this information was convenience sampling of truck drivers through the use of a survey. This

survey's questionnaire addressed all of the topics described above. A copy of the final questionnaire can be seen in Appendix C.

We took a trip to the Port of Walvis Bay, which is where many shipments in and out of the Walvis Bay Corridors originate and terminate. Approximately 150 trucks utilize this port on a daily basis, which made it the ideal location to test our draft survey and obtain a wide variety of data. For approximately two hours, each group member was stationed at a different area of the port that had a high concentration of truck driver traffic. Two researchers worked with port guards at the main security gate where trucks enter and exit the container storage area. The guards stopped all trucks passing through the gate and asked if the driver would be willing to participate in a survey. Most drivers were willing to do this and allowed us to sit in their trucks as they filled out the questionnaire. We collected twelve questionnaires from this location. Another researcher was situated at the main offices where drivers had to bring certain shipping forms. He identified anyone with the shipping form as a truck driver and asked them about taking the survey. He collected three questionnaires from this location. A fourth researcher was located at the shipping/receiving gate where he collected five completed questionnaires. This provided us with 20 completed survey questionnaires, which made our sample represent over 10 percent of the total number of truck drivers who go through the port in an average day. The questionnaires themselves gave us valuable information, but more importantly, the process of having truck drivers fill out the form gave us insight into how to make the survey questions clearer and more useful for future surveying. The questionnaire used at this location is featured in Appendix B. The revised questionnaire in Appendix C was use for all subsequent surveying.

Three researchers revisited the Port of Walvis Bay to use the revised questionnaires to get more valid, relevant results from much clearer questions. We took similar stations at the port as we had previously. Two researchers were stationed near the main gate, approaching

trucks parked just outside the gate as well as trucks queued behind the gate awaiting passage. A third researcher was stationed in the office of the container terminal gate, approaching truck drivers about the survey as they entered the office to fill out paperwork. All three researchers spent the day at the port, working from 8h00 to 17h00. We collected a total of 40 questionnaires: 19 from the main gate and 21 from the container terminal gate.

One researcher traveled to Gobabis, another town identified by the WBCG as one which requires a new truck stop facility. The researcher was accompanied by a local to Gobabis who acted as a translator. Together they traveled to Engen's Eastern 1 Stop Pegasus Service Station. One questionnaire was completed there.

The third survey location was the Windhoek Truckport, located in Namibia's capital of Windhoek, which is a popular delivery destination for truck drivers coming from the Port of Walvis Bay. The truck

port in Windhoek features a centralized parking area and take-away food shop, making it very easy to find truck drivers. We stood outside the take-away area, pictured in



**Figure 6 - Take-away area at the Windhoek Truckport**

Figure 6, for about 1 hour and asked drivers in the area if they would be willing to take a survey that would be used to create a plan for the installation of truck stops at certain areas in Namibia. Using this method we were able to collect seven additional questionnaires, which increased the diversity and size of our sample population.

The fourth location we surveyed was Oshikango, the last town located along the Trans-Cunene Corridor before the Angolan border. Any driver shipping to Angola must stop there because that is where customs and immigration facilities for that border are located. As

there is no existing infrastructure in Oshikango for trucks, truck drivers park along the roads throughout the municipality, as shown in Figure 7. Two researchers and the WBCG liaison



**Figure 7 - Trucks parked along the roads in Oshikango**

traveled to this location. The group walked around the municipality and approached trucks parked along the roads. Using this method, the group was able to collect 19 surveys and conduct several informal interviews.

After the survey was completed in these locations, we had obtained a total of 67 completed questionnaires from a diverse sample of truck drivers in Namibia. This gave us a significant amount of data that we used to decide what services should be at truck stops.

### **3.1.2 INTERVIEWS WITH TRANSPORT COMPANY OWNERS**

With the help of our sponsor, we contacted transport company owners from Wesbank Transport in Walvis Bay and Van der Walt Transport in Swakopmund. We interviewed them at each company's respective headquarters. The procedures for both interviews were very similar. Our team and our sponsor met with Mr. Van Rooyen from Wesbank Transport and later with Bertie Opperman from Van der Walt Transport. In the interviews, we wanted to determine which services should be provided at truck stops, including vehicle maintenance, parking, health services, lodging, showering, food, and security. Discussion also included the types of equipment their trucks and truck drivers use, servicing requirements for their trucks, and whether or not there are any features the transport company owners felt a truck stop should have in order to maximize efficiency and desirability of use. See Appendix F for the specific interview questions we used.

We obtained a list of 36 Namibian transport companies and their contact information from the WBCG's Edward Shivute. We emailed all of these transport companies, asking for two basic statistics: how many trucks they currently have in operation and how much money they lose to theft each year. Additionally, we asked if they would encourage their drivers to stop at a location with guaranteed security. We ensured all recipients that their information would remain confidential. The purpose of collecting these particular pieces of data was to generate useful theft statistics. The email we sent can be seen in Appendix P.

### **3.1.3 DISCUSSIONS WITH TRUCK STOP AND TRUCK PORT REPRESENTATIVES**

Van der Walt Transport is a unique company because in addition to its transport business, it also operates its own truck port in Swakopmund, on the west coast of Namibia. This facility, the Swakop Engen Truck Port, is similar to the kind of truck stop the WBCG would like to have installed along the corridors. During the interview, we focused on the current operations of their facility. Specifically, we asked about truck stop features, issues with running their truck port, staffing, and general recommendations that they might have for our plan. See Appendix G for the interview questions used. After the original interview with Mr. Opperman, we sent him an email asking follow-up questions regarding running a truck port, including operational costs, security offered, and the size of the facilities. This email can be found in Appendix Q.

The Windhoek Truckport is one of the few places that offers drivers a secure place to park their trucks. Although the truck port would need certain upgrades if it were to be considered a truck stop, it still offers drivers more services than most service stations. We identified the owner, Adam Boshoff, as an important person to interview because he is one of few people in Namibia offering a truck port catering only to truck drivers. We asked Mr. Boshoff questions regarding truck port utilization, services provided, and problems with theft. The interview questions are located in Appendix O.

Maputo Corridor Logistics Initiative (MCLI) is a South African company that deals with transportation along South Africa's corridors. They recently opened the Cool Ideas Truck Stop on the Maputo Corridor in South Africa. Karl Erichsen is the coordinator and spokesperson for the truck stop project, so we decided that he would be a valuable person to contact in order to gain further insight into the installation of truck stops. We emailed Mr. Erichsen a set of questions to gather information regarding the logistical and financial aspects of running a truck stop. We collected data on what services their truck stop offers and the costs associated with each of these services. We also asked about water and electricity use for the facility. See Appendix R for questions asked.

#### **3.1.4 INTERVIEWS WITH HEALTH SERVICES REPRESENTATIVES**

Due to the problem posed by HIV/AIDS to many Africans and especially to truck drivers and others in the transport sector, our sponsor pre-determined that an HIV/AIDS awareness plan was a necessity at truck stops. The WBCG has been running an HIV/AIDS Help Desk since March 2003 in order to promote the awareness of HIV/AIDS throughout the transport sector. Through discussion with Edward Shivute from the WBCG HIV/AIDS Help Desk and Lizelle Miller, a social worker at the Polytechnic of Namibia, we determined what should go into an awareness plan at truck stops and the nomenclature that should be used in naming the wellness facilities. In conjunction with this awareness plan, we also discussed what further health services should be offered. The interview questions we used can be seen in Appendix I and Appendix J for Lizelle Miller and Edward Shivute respectively.

#### **3.1.5 TRAFFIC DATA COLLECTION**

In order to accurately estimate the demand for services at each of the truck stops, we needed to determine how many trucks were traveling along each corridor. To obtain this information, we contacted officials at the Port of Walvis Bay and officials working for the Namibian Roads Authority.

We contacted Kobus Engelbrecht, Management Accounting Clerk at Namport, and asked for statistics regarding the volume of shipments through the port to various locations. We also inquired about the theft of goods along the corridors, since security had been identified as an issue by both transport companies and truck drivers. A complete list of the questions asked can be found in Appendix V.

The Namibian Roads Authority manages the national road network in order to create a safe and efficient road sector to promote economic growth. One of their jurisdictions is over the weighing stations throughout Namibia. We contacted Sophia Belete-Tekie, Road Management System Manager at the Roads Authority, and requested traffic data along the corridors in terms of truck counts and theft information. The questions we asked are listed in Appendix W. Unfortunately, we did not receive information from her before the end of our project.

### **3.2 TRUCK STOP DESIGN**

We planned the site layout of a generic truck stop by creating a plan view, using SolidWorks software. Based on the truck driver survey results, interviews with transport companies, and truck stop owners, we were able to determine which services are necessary at a truck stop and where they should be placed relative to other services, and this is represented in our plan view. The actual space required for each service would depend upon other factors such as the current and projected traffic flow of each individual corridor and the location being analyzed. The plan view we created is based on more generic information that can generally be applied anywhere with effective results. These graphic representations provide potential funders with a physical view of what a truck stop should feature and how it should be arranged.

### **3.3 IDENTIFYING ADDITIONAL LOCATIONS FOR TRUCK STOPS**

One of our major project objectives was to make recommendations for additional locations where truck stops should be installed. In these locations, we aimed to first identify any service stations that could be renovated into full-service truck stops before recommending the construction of an entirely new facility. The two main ways we achieved this objective were by analyzing current driver behavior and by identifying existing service stations and their ability to expand.

#### **3.3.1 EXAMINATION OF DRIVER BEHAVIOR**

Examining current driver behavior is important in deciding which locations would be best suited for a truck stop. Our previously mentioned truck driver survey, available in Appendix C, included questions about how frequently and specifically where they stop while driving their routes. We analyzed this information to identify which urban areas should feature truck stops, taking into account both where drivers stop already and what infrastructure—in terms of service stations—already exists there.

#### **3.3.2 IDENTIFYING EXISTING SERVICE STATIONS**

In order to identify service stations to renovate into full-service truck stops, we first identified all service stations in Namibia from the five major petrol companies in Namibia. To do this, we visited the local Windhoek offices of Engen Petroleum, Caltex Oil, Beyond Petroleum (BP), Total, and Shell, and obtained lists or maps indicating the locations of each company's stations. We drafted a letter signed by the IQP team and Johny Smith, the Business Development Executive of the WBCG, explaining who we were and the purpose of our project. The letter was meant to assure the companies that we would only be using the information to advance our report. A copy of this letter can be found in Appendix M.

Additional methods were required to determine the contact information for certain service stations. Using the data given to us by Engen Petroleum and Total, which contained only the names of the stations and the towns in which they were located, we obtained the station telephone numbers using the Telecom Directory<sup>3</sup>. We then contacted service station employees for stations located in the highly trafficked urban areas as identified in the previous section to determine their expansion potential. The questions we used in these telephone interviews can be found in Appendix K. After gathering information from the phone calls, we used Table 3 below to rate the expansion potential of certain service stations in towns identified in the previous section.

**Table 3 - Feasibility of Service Station Expansion**

<b>Feasibility of Service Station Expansion</b>	
<input type="checkbox"/>	Service station currently has adjacent land available
<input type="checkbox"/>	Service station has easy access to a corridor (Less than 1 km from corridor)
<input type="checkbox"/>	Service station is on the outskirts of town (Trucks do not need to drive through the centre of an urban area to receive services)
<input type="checkbox"/>	Service station has diesel fuel available
All conditions must be met in order for a service station to be considered feasible for expansion. If all conditions are not met, it is recommended to build a new facility in a more suitable location closer to the corridor.	

We decided that basing feasibility on existing services would be both complicated and ineffective due to more important factors that must be considered.

### **3.4 SUMMARY**

Our team achieved our goal of creating a plan for the installation of truck stops through the numerous interviews and our survey of truck drivers. From all of these sources,

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<sup>3</sup> The Directory is the phone book of Namibia.

we compiled our results to determine which services should be available at truck stops and in which towns truck stops should be made available. We presented these findings to the WBCG in this IQP report.

## 4. RESULTS AND ANALYSIS

Through the methods previously described, we were able to achieve our goals of identifying the importance of various truck stop features and the locations for placement of truck stops along the Walvis Bay Corridors. We collected information about truck driver preferences and driving habits as well as the opinions of transport company officials, and we analyzed it to identify the relative demand for each service. We also gathered information about truck driver behaviors and the locations of existing service stations in order to plan where additional truck stops should be located.

### 4.1 DEMAND FOR TRUCK STOP FEATURES

Through a survey of 67 truck drivers as well as discussions with truck port and truck stop owners, transport company owners, and truck drivers, we created a prioritized list of services that truck stops should feature. This section identifies the numerous amenities that should go into truck stops, including security, parking, fuel, and numerous other services.

#### 4.1.1 SECURITY

Interviews with Mr. Van Rooyen from Wesbank Transport, Bertie Opperman from Van der Walt Transport, Adam Boshoff from the Windhoek Truckport, and various truck drivers suggested that security is the most significant problem along the corridors. The problems that

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*“I would use it, definitely, if I can guarantee it is safe.”*  
*-Bertie Opperman,*  
*Van der Walt Transport*

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frequently occur include siphoning of diesel from trucks and theft of tires, headlights, covers, and other parts. Hijacking of vehicles transporting desirable goods, such as food, cigarettes, alcohol, and consumer goods, can also be a significant problem in other countries like South Africa, though it is not a problem in Namibia. One owner of a small, short-distance transport company who responded to our mass email claimed losses to theft of N\$80,000 per year over

ten trucks, for an average loss per truck of N\$8,000. These results made it very clear that a secure parking area with fencing and gate control is a feature that transport company owners find imperative to have at all truck stops. Both Mr. Opperman and Mr. Boshoff specifically said that security was the primary issue along the corridors, and the transport company owner who responded to the email said that staying at a secure stopping location would be an order to his drivers. The results of these interviews can be seen in Appendices X, Z, and EE.

To follow up with security questions, we contacted Leon Lombaard from the local office of Group 4 Securicor (G4S), a security contractor, to get his views on truck stop security. G4S provides numerous types of security services through its four divisions. The divisions are: Guarding Division, Assets in Transit Division, Alarm Systems/Armed Response Division, and a Vehicle Tracking Division. He reported that G4S services are not yet available throughout all of Namibia. They are generally provided in most major towns except Otjiwarongo, Otavi, Grootfontein, Luderitz, Keetmanshoop, and Gobabis. Service availability is limited because any city that has a Guarding Division also requires an Armed Response Division to provide backup to guards. It would be ineffective to place guards in a city that did not feature an Armed Response Division because guards are unarmed and consequently do not have any real power.

Mr. Lombaard suggested that having fenced areas for trucks to park could be a deterrent to theft, even though the costs might be prohibitive. He also suggested that another way to save money would be to have the guard working at the store or garage also look after the secured parking lot. Lack of a fence and dedicated security guards, however, seems to contradict both existing practices at truck ports and what transport company owners and truck drivers want, as evidenced by their statements at the beginning of this section. The Windhoek Truckport provides a fenced parking area with two security guards and an armed guard at night, with patrols between trucks. The Swakop Engen Truck Port will also soon

have secure, fenced parking across the street from the existing facility. The Cool Ideas Truck Stop in South Africa features electric fencing around their always-lit parking lot with two guards during the day and three guards with a dog at night. They charge R70 (N\$70) for overnight parking and guarantee the stay without any theft on the property<sup>4</sup>. All of this seems to suggest that a much stronger emphasis on security must be taken, and that Mr. Lombaard's cost-saving suggestions would not be appropriate for a properly secured truck stop.

Additional issues that must be considered when providing security deal with liability. Mr. Lombaard commented that legal interpretation might suggest that the truck stop was subcontracting security services from the security company to individual trucks and that the security provider would therefore be liable for any theft and other damages. This would raise the issue of who was liable for any thefts or vandalism that might occur. This would need to be made clear and put in writing before security services could be provided. A summary of the interview with Mr. Lombaard can be found in Appendix CC.

#### **4.1.2 PARKING**

Parking facilities are important because they inherently make trucks easier to secure. A centralized parking area allows for a large group of trucks to be secured simultaneously rather than having trucks parked along the sides of the road. Bertie Opperman, owner of the Swakop Engen Truck Port, said that a large paved area was a necessity for the truck parking area. Mr. Opperman is in the process of adding an additional truck parking lot across the street which will be a fenced, paved area of 2,400-3,000 square meters. The Cool Ideas Truck Stop also has a large gravel parking area of about 40,000 square meters, which currently accommodates 150 trucks, but can be expanded to hold 250. The Windhoek Truckport also features a large paved parking area, shown in Figure 8. These data suggest that the parking area at truck stops should ideally be paved due to the inherent cleanliness and

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<sup>4</sup> Personal items, such as cell phones, are not part of this guarantee.

the need for less upkeep, but that it can be gravel if there are monetary constraints.

Additionally, the parking area should be subject to the security measures described in section 4.1.1.



**Figure 8 - Windhoek Truckport Parking Area**

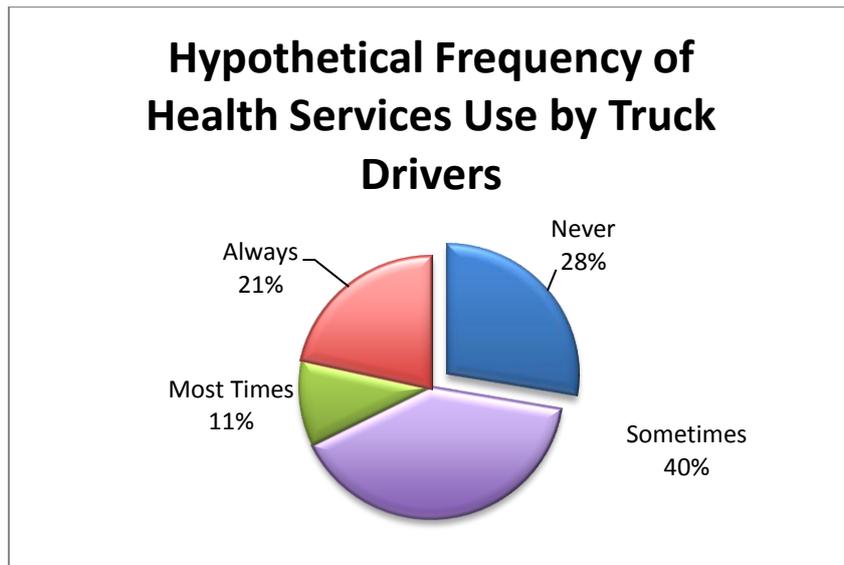
#### **4.1.3 WELLNESS CENTRE**

After interviewing Ms. Lizelle Miller, the social worker at the Polytechnic of Namibia, and Mr. Edward Shivute, the Project Coordinator of the WBCG HIV/AIDS Help Desk, we found that Wellness Centres are a necessary feature for every truck stop to promote the health of truck drivers. The main goal of these Wellness Centres is to provide HIV/AIDS awareness among the truck driving community. Through these interviews, we gained insight into the truck driving lifestyle and why drivers are at such high risk for contracting HIV/AIDS. Their trips can keep them away from their homes for as long as a month at a time, creating a situation in which they would be more inclined to seek out commercial sex services. With the current lack of parking areas, truck drivers are forced to stop along the side of the roads in towns when they are either close to an international border or finished driving for the night. They generally congregate in the same areas, so they are often approached by commercial sex workers. This situation puts truck drivers at risk for

contracting STDs, including HIV, so it is important that they are educated so that they can keep themselves safe and healthy.

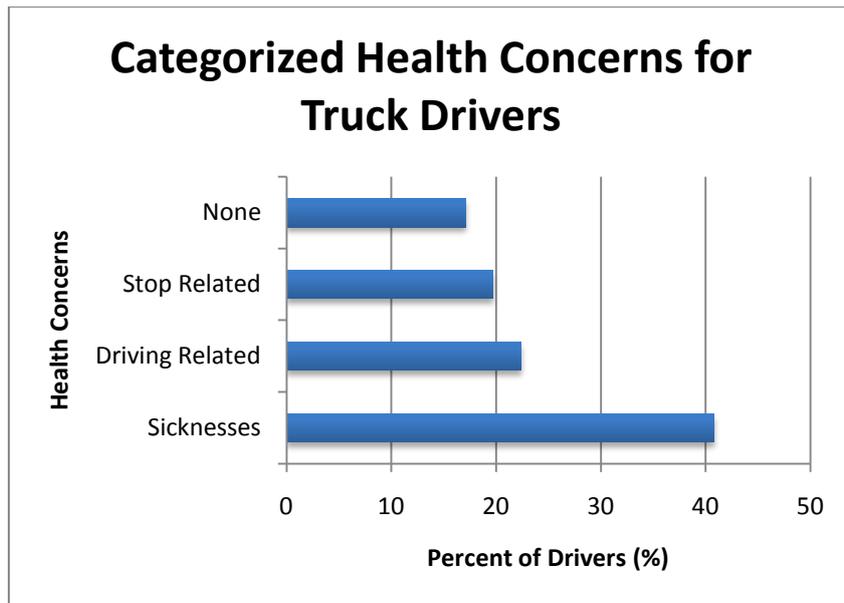
Both Ms. Miller and Mr. Shivute agreed that having information readily available at a truck stop will help to educate the truck drivers to make better, safer decisions. However, there are certain steps that must be taken in order to ensure that the Wellness Centres will be utilized by the truck drivers. Mr. Shivute suggested that the centres should be called something general such as Wellness Centres, rather than HIV/AIDS Centres. They should also offer other health services, such as medicine distribution, which would help to decrease the stigma attached with going to the centre and would also bring more drivers there. Having drivers go to the centre for other purposes would expose them to HIV/AIDS information while there and encourage them to look into it. He also mentioned that having recreational activities in close proximity to the centres would encourage drivers to stop there. This is similar to Ms. Miller's idea of having movies playing near the centres and showing a short public service announcement in between each movie. In certain secondary truck stops where the installation of a full-scale Wellness Centre is not economically feasible, a health awareness table should be installed that provides free condoms, HIV/AIDS information, and other miscellaneous instructional health pamphlets to help educate drivers to keep them safe.

Currently, the Swakop Engen Truck Port, the Windhoek Truckport, and the Cool Ideas Truck Stop have no health services available on site. However, Mr. Erichsen informed us that MCLI is currently working to introduce a health clinic at the Cool Ideas Truck Stop. The lack of health services at other truck stops, however, should not reflect the lack of need for them. The survey of truck drivers revealed that 72% of drivers would use health service centres if offered, with 32% claiming they would use them at least most of the times that they stop. The results from this survey question can be seen in Figure 9.



**Figure 9 - Hypothetical Frequency of Health Services Use by Truck Drivers in Namibia**

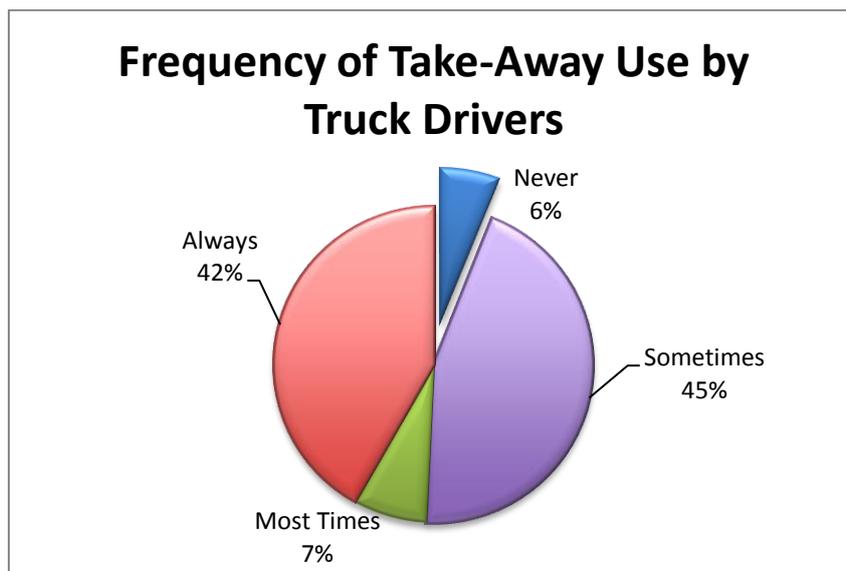
Drivers were additionally asked what types of health problems they encounter while driving, and the myriad of issues they reported also reflects this need. We categorized the various types of health concerns into issues caused by driving long hours, issues caused by sicknesses, and issues related to stopping. Issues caused by long driving hours include back and knee aches, fatigue, and eye strain. Concerns in the stop-related category are issues caused by the facilities where they currently stop, such as bladder infections due to the cleanliness of the facility or food poisoning due to tainted food. Figure 10 shows the data reported by drivers, indicating significant problems with stop-related and driving-related issues. Stop-related issues could be alleviated by creating better stopping locations, and driving-related issues could be alleviated simply by stopping more frequently. These numerous health issues and the potential use of health services make it a service that should be introduced at all Namibian truck stops.



**Figure 10 - Health Issues for Truck Drivers**

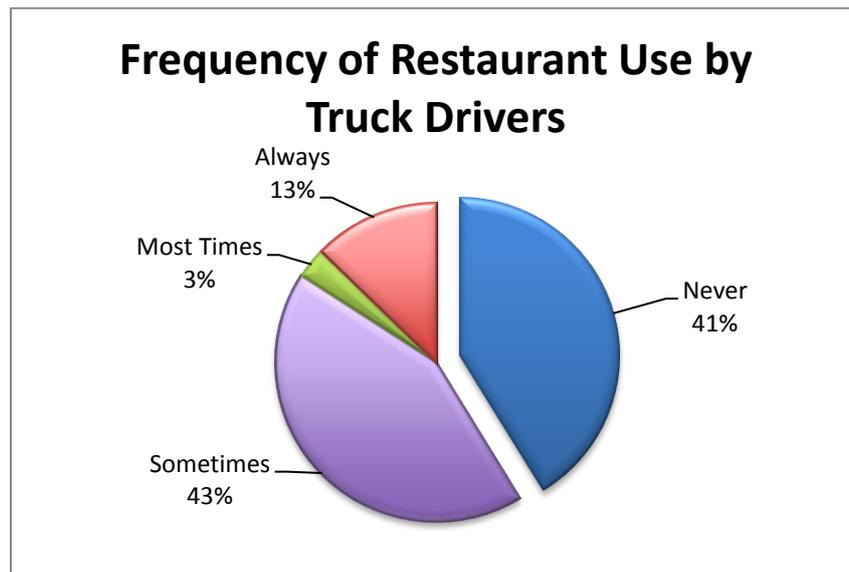
**4.1.4 TAKE-AWAY & RESTAURANTS**

Take-aways are small hot food stands that are available in many service stations throughout Namibia. They offer truck drivers the opportunity to get something to eat that is more substantial and nutritious than miscellaneous snacks offered at a convenience store but cheaper than restaurant meals. When we asked truck drivers how often they used take-aways, 94% responded that they use take-aways at least sometimes with 42% saying they always use them. Figure 11 shows the full breakdown of responses.



**Figure 11 - Frequency of Take-Away Use by Truck Drivers in Namibia**

When truck drivers were asked how often they use restaurants, the response was starkly different from that of take-aways. Many drivers responded that they would never use restaurants, as 41% of the drivers responded this way. Even of the 59% that do eat at restaurants, 43% only do so sometimes. Discussions with drivers revealed that this is because of the expense and time involved with a restaurant meal compared to buying food from other places. The data are located in Figure 12 below.

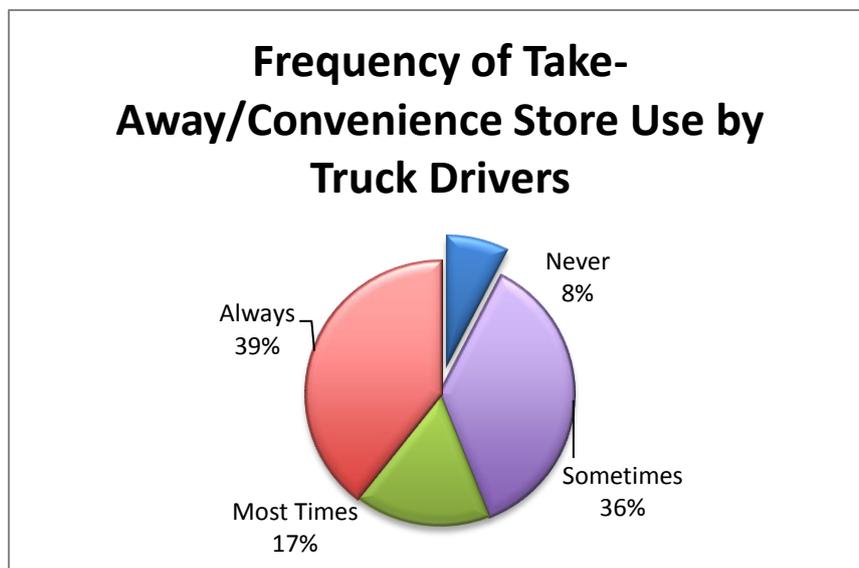


**Figure 12 - Frequency of Restaurant Use by Truck Drivers in Namibia**

Overall, our data tell us that some type of take-away area should be made available to truck drivers at all truck stops. Their frequency of use would certainly generate profits to the owners, and they would be a welcome addition for drivers looking for food. Restaurants should likely not be offered except in the larger truck stops located near borders, as they are much less likely to be utilized. Restaurants are more likely to be used by drivers at the border locations because they are under much less time pressure there, as they are waiting for customs clearance anyway. In those cases in which restaurants are offered, they will need to be cheap in order for drivers to be willing to go there.

#### 4.1.5 CONVENIENCE STORE

Although convenience stores are generally offered at many service stations in Namibia, we wanted data to justify their installation at new truck stops. Survey results suggested that 92% of truck drivers would use a convenience store or take-away if one was offered. Of these, 39% of respondents would use convenience stores every time they stop. See Figure 13 for a graph of the results. The Cool Ideas Truck Stop in South Africa features a kiosk while the Swakop Engen Truck Port features a convenience store and take-away. It is important to note, however, that these data might be skewed due to the fact that the question combined take-aways with the convenience stores in which they are offered, confounding the results. These data tell us that a convenience store should be offered at truck stops, along with a take-away, which is almost always seen at service station convenience stores in Namibia.



**Figure 13 - Hypothetical Frequency of Take-Away/Convenience Store Use by Truck Drivers in Namibia**

#### 4.1.6 BED & BREAKFAST

If truck stops offered a bed and breakfast, over half of truck drivers said that they would use it at least some of the times they stop, as shown in Figure 14. Informal interviews with truck drivers indicated that these results might be explained both by the need to secure

their trucks as well as the cost to drivers of using a bed and breakfast. Some drivers explained that they did not have the money to spend on a bed and breakfast, and that they could not justify it since they have beds in the cabs of their trucks. Additionally, 62% of drivers reported that they would still sleep in their trucks even if their trucks were guaranteed to have safe parking. Figure 15 shows these results.

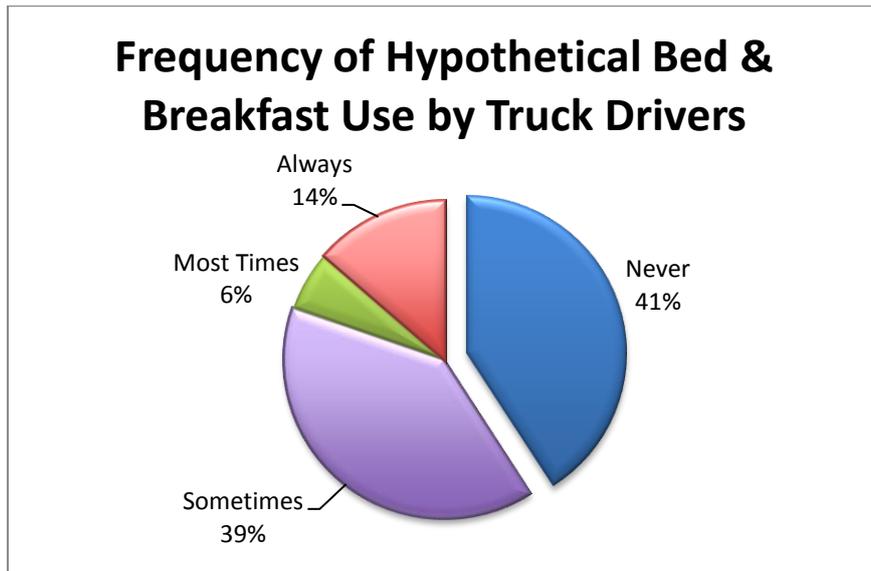


Figure 14 - Hypothetical Frequency of Bed & Breakfast Use by Truck Drivers in Namibia

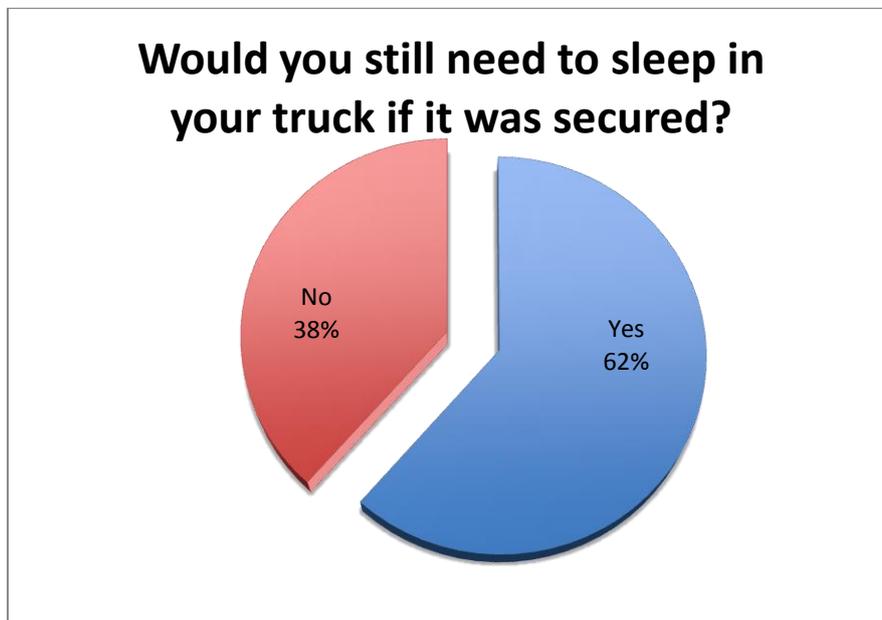


Figure 15 - Data indicating if truck drivers would sleep in their trucks regardless of security

These results suggest that perhaps bed & breakfast facilities, or some other affordable type of lodging, could be offered at some truck stops. An effective implementation strategy would be to feature lodging facilities at full-service truck stops located at the border areas where truck drivers are likely to stay for more lengthy periods of time. This would reduce the cost of implementing truck stops located in areas where truck drivers do not usually stop for long periods of time. Additionally, in order to entice drivers to stay there when lodging is offered, the facilities must be affordable while still a worthwhile upgrade from simply staying in their trucks, as they are used to doing anyway.

#### 4.1.7 FUEL

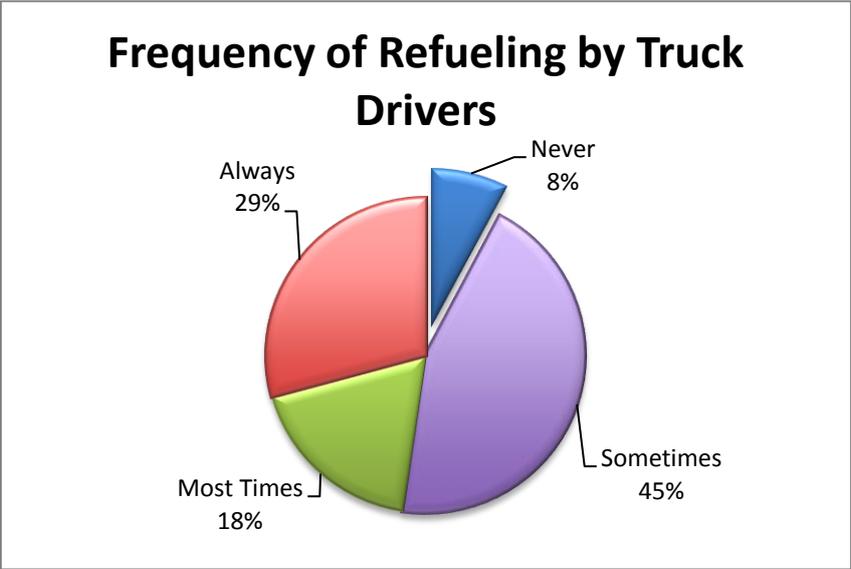
Fuel is one of the most important services that truck drivers need. Therefore, it is no



**Figure 16 - Trucks pumping diesel fuel at the Windhoek Truckport**

surprise that 92% of the long-distance truck drivers sampled stop for fuel on their routes. Almost a third of the sample responded that they always stop for fuel. These survey results are displayed in Figure 17. When drivers do stop, they require specialized fuel pumps.

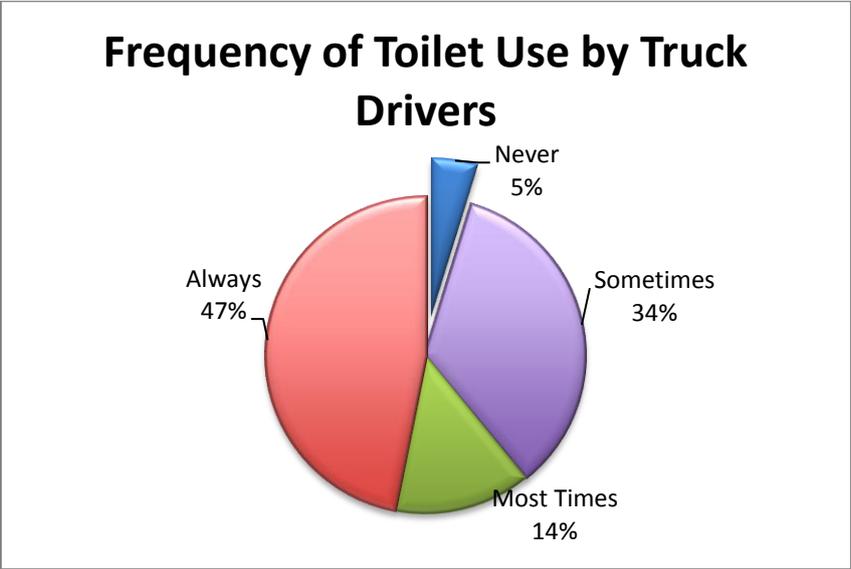
Trucks require fuel pumps with high clearance, as shown in Figure 16. The Cool Ideas Truck Stop provides six 24-hour diesel pumps with a 138,000 liter capacity. The Windhoek Truckport offers four diesel pumps, and the Swakop Engen Truck Port also offers diesel fuel. These results make it clear that diesel fueling stations should be available at all truck stops.



**Figure 17 - Frequency of Refueling by Truck Drivers in Namibia**

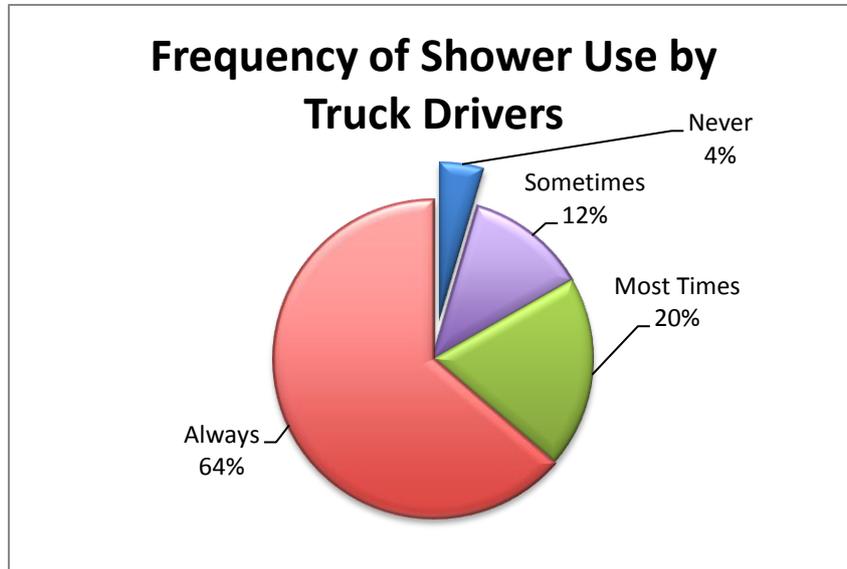
**4.1.8 TOILETS, SHOWERS, & LAUNDRY**

Toilets are also one of the most important services that must be made available at truck stops. As shown in Figure 18, 95% of the sample of truck drivers surveyed agreed that they stop to use toilets at least sometimes. Almost half of the drivers replied that they always use toilets when they stop. This makes the need for toilets very clear.



**Figure 18 - Frequency of Toilet Use by Truck Drivers in Namibia**

Shower facilities would reportedly be used by the vast majority of drivers, as only 4% said that they would never use them. Almost two-thirds of drivers would shower every time they stopped. Shower results are featured in Figure 19.



**Figure 19 - Hypothetical Frequency of Shower Use by Truck Drivers in Namibia**

The Cool Ideas Truck Stop in South Africa has eight individual toilets, each containing a toilet and shower. They also offer eight laundry basins to allow truck drivers to do their laundry when they stop. Laundry basins would also be a simple addition to add to truck stops, especially those located near borders where truck drivers are likely to stay for a longer period of time, giving them the chance to do their laundry. The Windhoek Truckport also offers showers, pictured in Figure 20.



**Figure 20 - Showers at the Windhoek Truckport**

Our data suggest that we should definitely plan to have toilets and showers at the new truck stops. In business, high demand for a product or service generally dictates that it should have a high price. However, as truck drivers are very cost-conscious, this is not recommended. We believe that drivers would be very resentful of having to pay for use of

toilet and shower facilities. A better way to monetize truck stops would be to charge a small fee for parking, as the Cool Ideas Truck Stop does, and offer free use of toilet and shower facilities. We would recommend that all truck stops offer toilets and showers, as drivers would utilize these services very frequently.

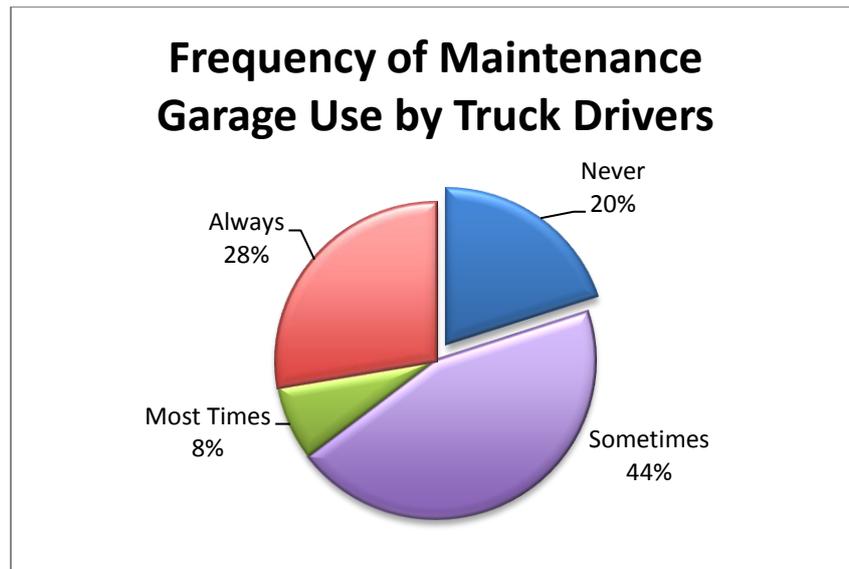
#### 4.1.9 MAINTENANCE GARAGE

As shown in Figure 22, 80% of the sampled truck drivers claimed that they at least sometimes use vehicle maintenance services when they stop. However, they currently must drive through towns in search of a maintenance garage that is reliable and affordable. The Swakop Engen Truck Port



**Figure 21 - Repair garage at Swakop Engen Truck Port**

offers truck repairs, a tyre centre, and a truck wash, shown in Figure 21. The South African Cool Ideas Truck Stop offers truck repairs, a tyre centre, a truck wash, and truck greasing. We propose that a maintenance garage be provided at each of the new truck stops because the drivers would already be at the truck stop for other amenities and would no longer have to go searching. The fact that surveyed drivers broke down an average of 2.76 times in the past year also suggests that maintenance garages should be easily accessible and frequently available along the corridors.



**Figure 22 - Frequency of Maintenance Garage Use by Truck Drivers in Namibia**

From our interviews with Bertie Opperman and Mr. Van Rooyen, we learned how transport companies currently operate in terms of obtaining maintenance services for their trucks. The most common repairs that are needed are new tyres, oil changes, greasing of the trucks, and headlight repairs. Transport companies typically have contacts in many towns along the corridors to which they prefer to have their trucks taken for minor repairs. If more complicated repairs are needed, drivers are forced to take their trucks to the nearest depot for their respective transport company. If a driver is stranded completely, often the transport company will have to ship parts to them to repair on the road. To make vehicle repair more efficient, maintenance garages should be installed at every proposed truck stop along the corridors. This would allow trucks to be repaired without having to detour far from their delivery route, dramatically expediting the repair process. Currently, there are also towing companies in most towns that can be used to bring broken down trucks to the desired location. The addition of maintenance garages to the corridors will result in more efficient transportation throughout Namibia.

#### 4.1.10 BANKING

An important service for drivers along the road is the ability to access money. Without access to money, they may not be able to pay for the use of certain services provided by the truck stop. As shown in Figure 23, nearly three-fourths of drivers claim that they use ATMs at least some of the times they stop. Currently, ATMs are usually situated in or near a convenience store at service stations. This should be an effective placement strategy for truck stops.

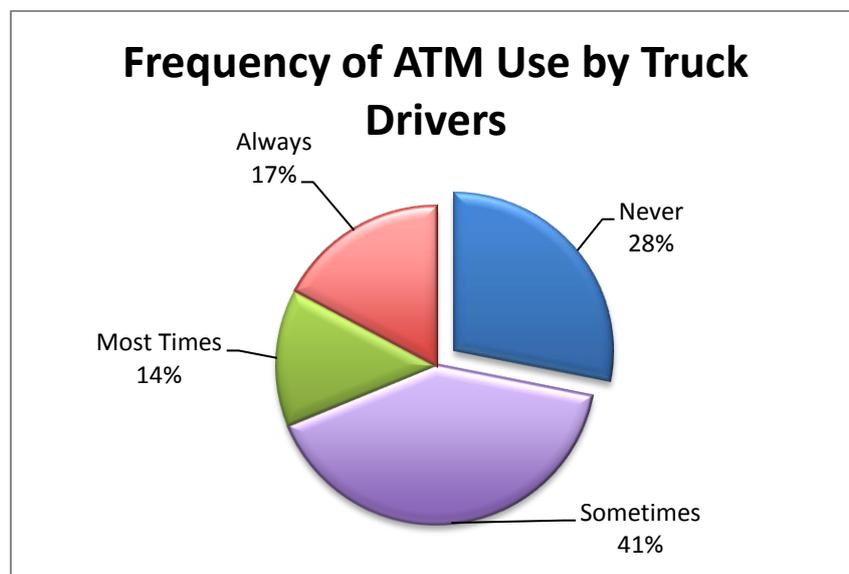
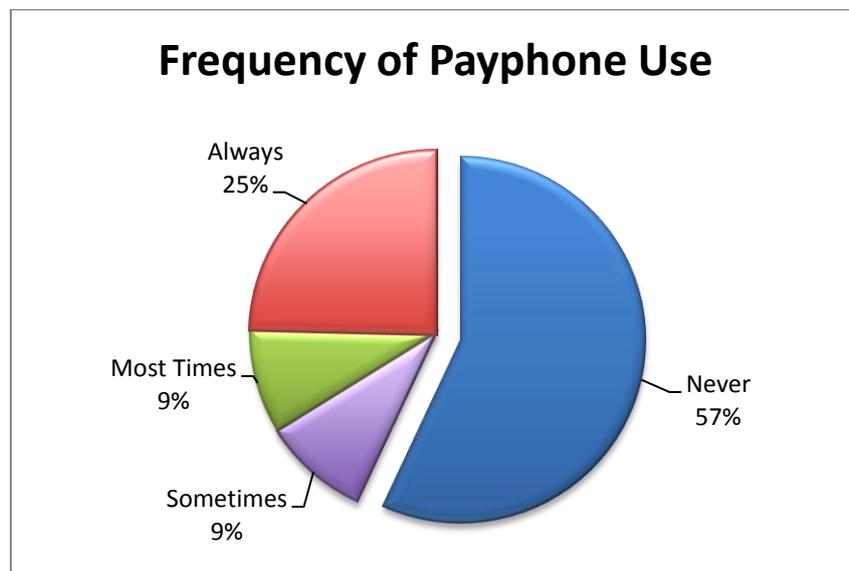


Figure 23 - Frequency of ATM Use by Truck Drivers in Namibia

#### 4.1.11 PAYPHONES

Drivers were also asked how frequently they used payphones. Figure 24 shows that over half of the drivers surveyed never use payphones while 25% always use them. Figure 24 illustrates the responses to this question. We believe that these results may be skewed due to confusion over whether the question referred to payphones or cell phones. During some of the questionnaires, we clarified to the drivers that the question was about payphones, and this would sometimes cause them to change their answers. Nevertheless, at least one payphone should be provided at truck stops for special cases or emergencies. Additionally, arrangements should be made to ensure cellular coverage at the truck stop site in the event

that there is not adequate coverage already, as cell phones are often the only means of communication while out on the road.

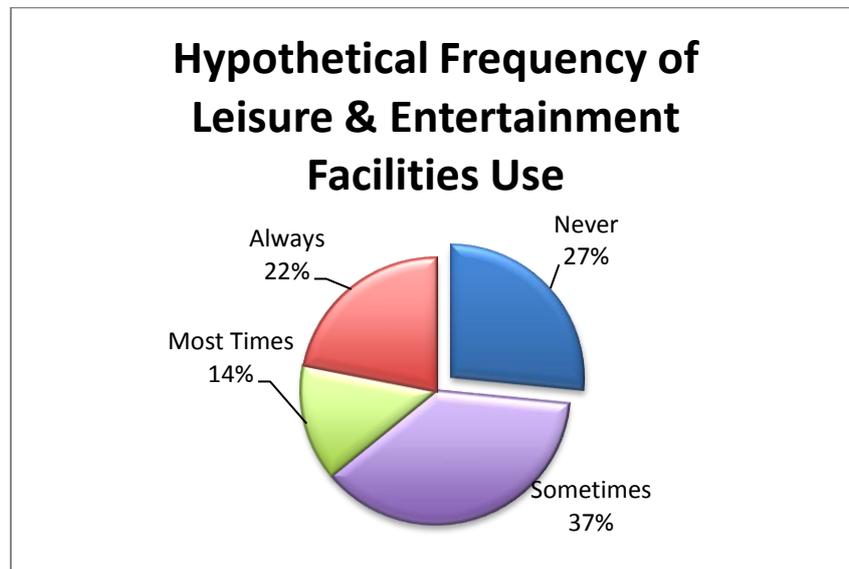


**Figure 24 - Frequency of Payphone Use by Truck Drivers in Namibia**

#### **4.1.12 LEISURE & ENTERTAINMENT**

In the United States, truck stops typically have a lounge area that provides various types of entertainment, such as a television, arcade games, or pool tables. As seen in Figure 25, truck drivers in Namibia reported that almost three quarters of them would make use of leisure and entertainment services at least sometimes when they stop. The relatively significant percentage of drivers who reported they would never use leisure activities is likely due to time constraints, as several drivers reported not having sufficient time to rest and sleep, let alone time to spend enjoying themselves. Despite this, having a lounge area at each new truck stop with seating accommodations and possibly a television, a pool table, and card tables would give drivers the option of staying at the truck stop to relax and rest. The Windhoek Truckport offers a television, pool tables, and numerous picnic tables which could be used to play cards. Having activities available makes drivers less likely to looking for entertainment in the local community, decreasing the risk of drivers indulging in alcohol and commercial sex workers, as there would be alternative sources of entertainment available. It

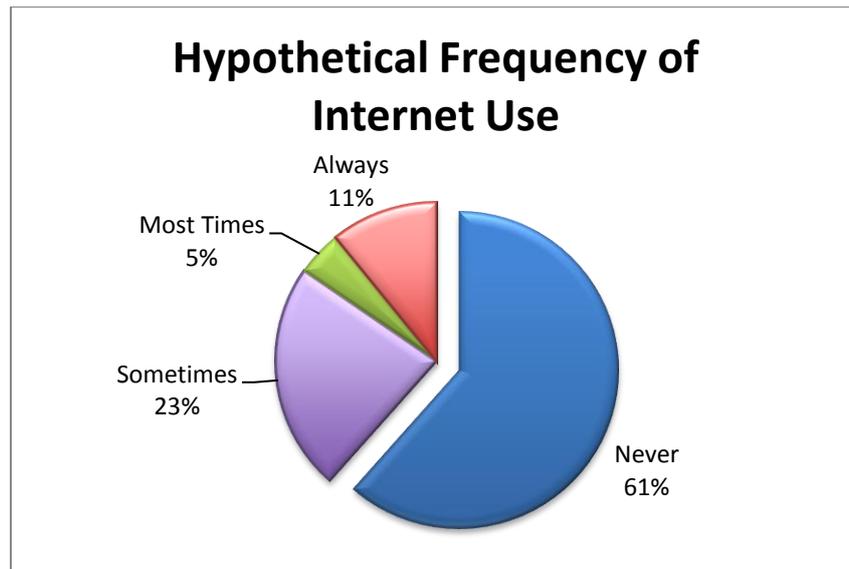
would also provide drivers with enjoyable activities during the legally required driving breaks, and it would hopefully create the tradition among truck drivers of taking breaks.



**Figure 25 - Hypothetical Use of Leisure & Entertainment Facilities by Truck Drivers in Namibia**

#### **4.1.13 INTERNET ACCESS**

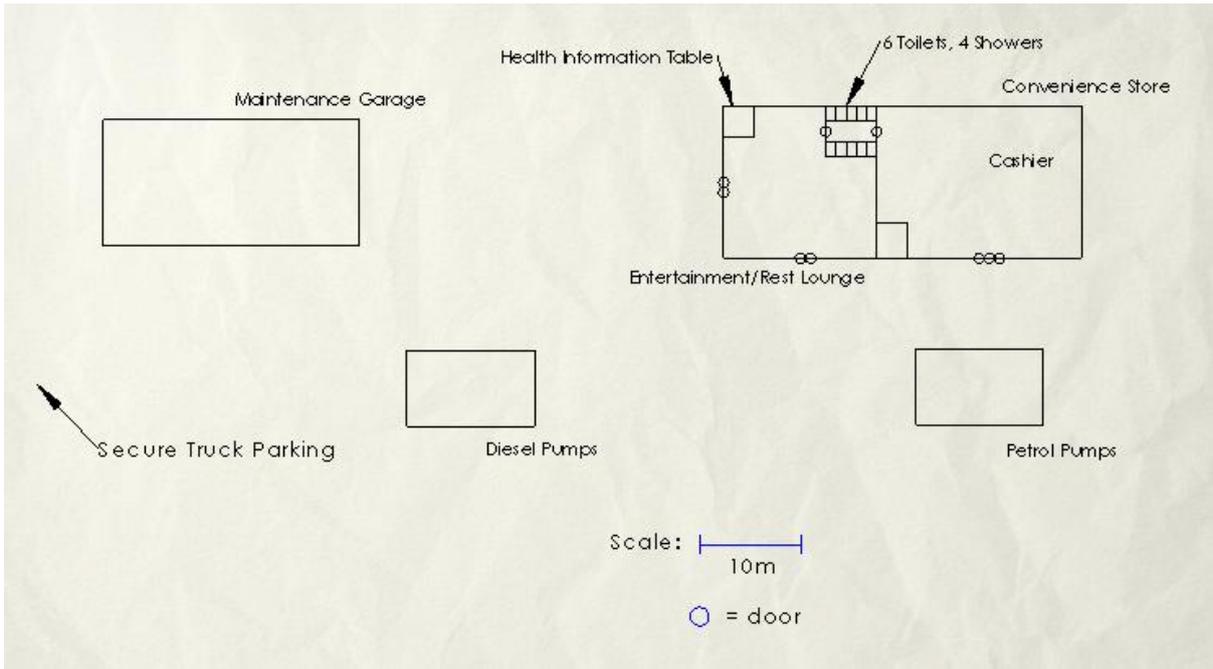
Internet access is a service we initially considered might be used in a lounge area. However, it proved to be very uninteresting to truck drivers, as 61% reported that they would probably never use it. Of those who would use it, only 16% would use it at least most of the time. Figure 26 displays a complete summary of the results for internet access. Based on these data, it is unlikely that the cost for installation of networking equipment and internet connectivity is worth the currently small demand for internet access. Should driver demand for internet access increase in the future as Namibia becomes more developed, the introduction of this feature should be reassessed.



**Figure 26 - Frequency of Hypothetical Internet Use by Truck Drivers in Namibia**

#### **4.1.14 FEATURE LAYOUT**

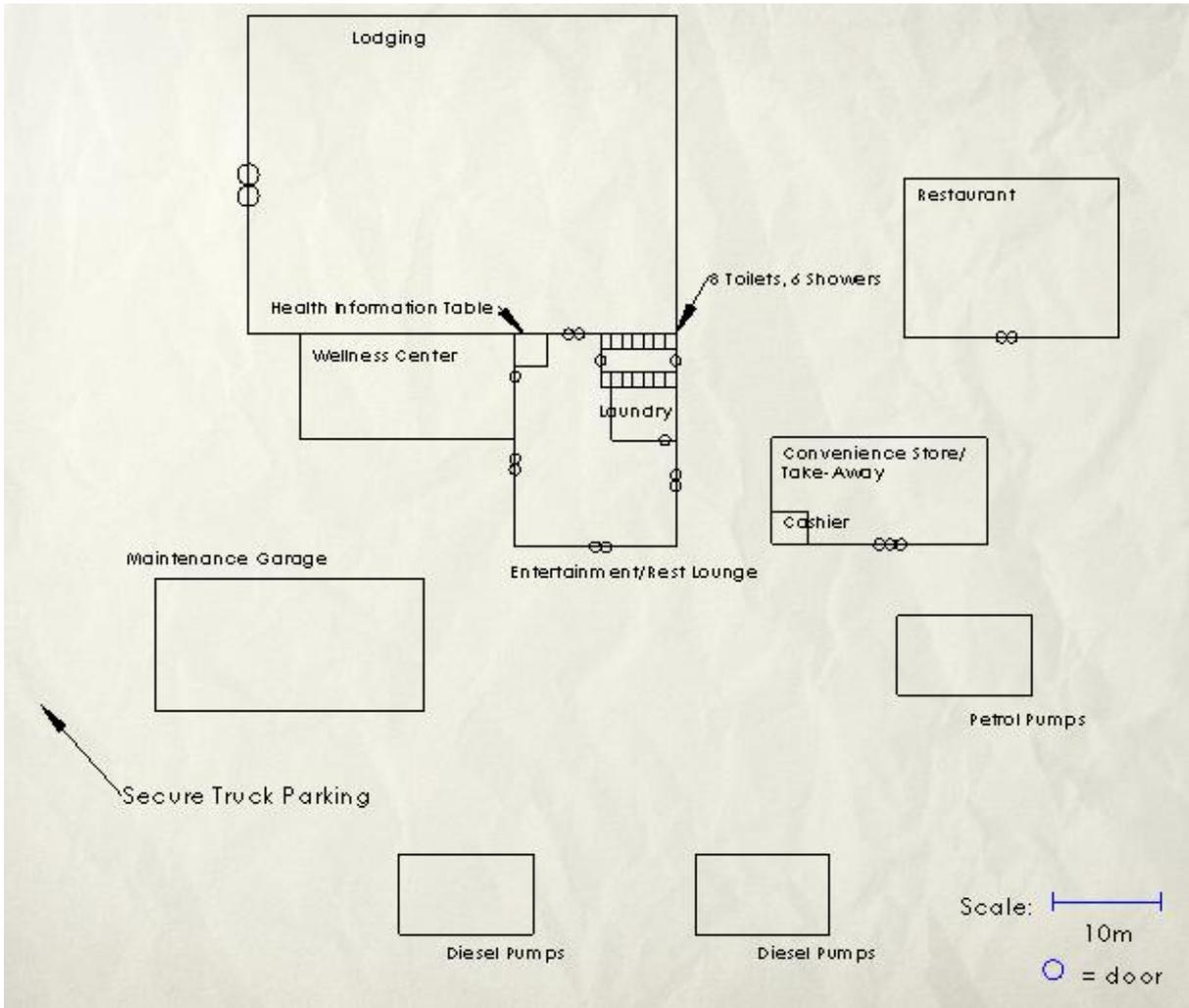
As discussed above, not all truck stops will feature all of the services mentioned above. Secondary truck stops with the minimum required services will usually lack a restaurant and lodging facilities, and they will typically be smaller. These truck stops are designed to accommodate the drivers who are only stopping for a short time, rather than those who need to stop for several hours or even days. They are specifically designed to provide services for truck drivers who are stopping to obey the driving laws, to use short term services like toilets or convenience store and take-away, or in cases where vehicle repairs are needed. However, these stops will also be used by other motorists, which is why petrol filling pumps should be available close to the convenience store. A suggested layout for a truck stop with minimal features can be seen in Figure 27 and Appendix HH.



**Figure 27 - Secondary truck stop site plan**

The full-service truck stops to be installed at border locations will provide the same services as the previously mentioned stops, but in greater quantities, due to the larger amount of standing traffic waiting to clear customs. They should also provide lodging arrangements and inexpensive restaurants, which will not only increase the profitability of the truck stop, but also benefit the drivers that do not typically have the option to use these facilities.

Drawings for the full-service truck stops at border locations can be seen in Figure 28 and Appendix II.



**Figure 28 - Full-service border location truck stop site plan**

## 4.2 LOCATING TRUCK STOPS

By analyzing truck driver resting and driving patterns from our survey, we identified several locations along the corridors where truck stops would be most useful. Because of the limited number of truck stops that the WBCG is hoping to have installed, and because they are only to be located in urban areas, the spacing interval criteria mentioned in section 2.3.1 was not fully considered when deciding which areas should be improved. Instead, intervals were subject to the new Namibian driving laws for truck drivers, which dictate that drivers can only drive for a maximum of five continuous hours before requiring a stop for rest. These laws can be found in Appendix N. Truck stop placement was based upon these driving laws as well as current truck driver habits.

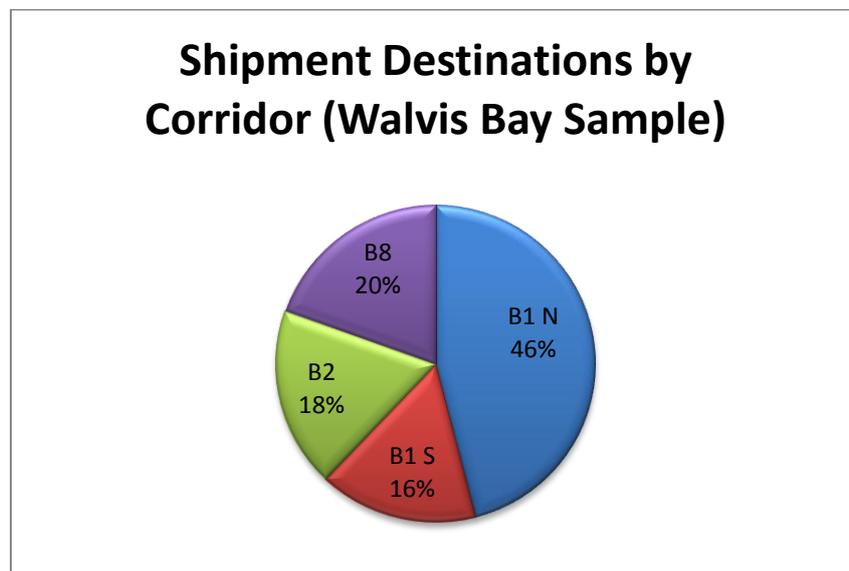
#### 4.2.1 TRAFFIC DATA ANALYSIS

Another method we used to analyze potential truck stop locations was to group survey results according to the corridors which the drivers use to deliver to their top locations. Using the stop and destination information, we determined which corridors each driver would use to reach his destination. We chose to only represent the data from the 40 drivers surveyed in Walvis Bay in this analysis, as this location represents a wider variety of drivers, giving us less skewed results. The drivers we surveyed in Oshikango and elsewhere were already en route to their destinations, which skews these data towards locations on the surveyed corridor. Drivers surveyed at the Port of Walvis Bay may be headed anywhere in Namibia or the surrounding countries.

Our results use the numerical names of the roads, since some of the stops are not actually on the named corridors. In this section of the report, the B1 S refers to the B1 route that runs south of Windhoek through Mariental and Keetmanshoop. It continues down into South Africa towards Cape Town. Although the B3, also known as the Trans-Oranje, breaks off from the B1 and heads towards Upington and Johannesburg, South Africa, this split takes place close enough to the border that the portion of the trip in Namibia is mostly along the B1 S, which is why we do not have an individual section for data for the B3. Similarly, the B1 N refers to the B1 route that runs north of Windhoek through Otjiwarongo, Otavi, and Tsumeb towards Oshikango. This is mostly comprised of the Trans-Cunene and Trans-Caprivi corridors, which begin in Walvis Bay and split at Otavi, with the Cunene stemming north and the Caprivi traveling east. The B8 refers to the segment of the Trans-Caprivi Corridor that breaks off from the B1 N and runs along the Caprivi Strip through Rundu and Katima Mulilo, finally ending in the Democratic Republic of Congo. The B6 refers to the portion of the Trans-Kalahari Corridor that runs east of Windhoek through Gobabis to Botswana. Finally, the B2 refers to the segment of the Trans-Kalahari Corridor that runs west of Windhoek

through Swakopmund, ending in Walvis Bay. We considered Windhoek to be on the B2 for this analysis, as the routes of the drivers represented all originated in Walvis Bay and these drivers would therefore be taking the B2 corridor to reach Windhoek.

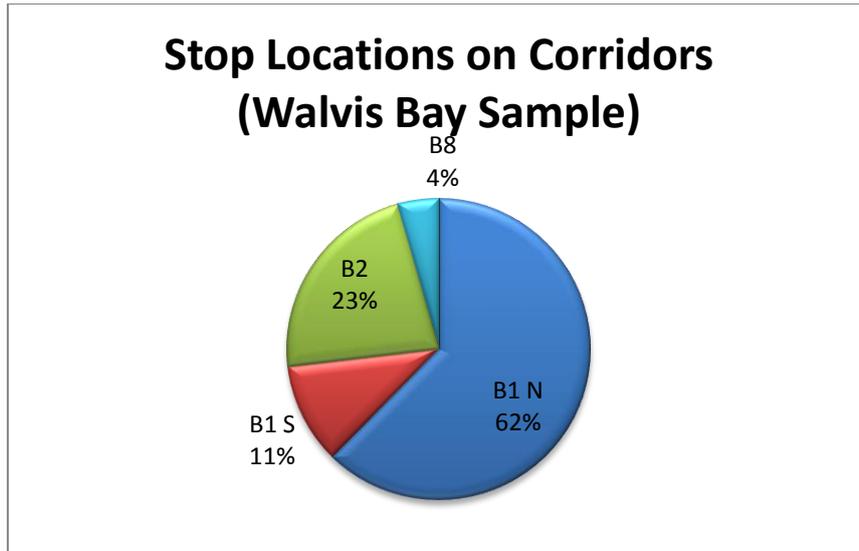
According to the data gathered from our surveys, the most common shipment destinations for truck drivers leaving Walvis Bay are on the B1 N, particularly Oshikango and destinations in Angola. This accounts for 46% of the drivers surveyed as seen in Figure 29.



**Figure 29 - Shipment Destinations by Corridor for Truck Drivers Surveyed in Walvis Bay**

Another 20% of drivers claimed to make deliveries using the B8 corridor, to destinations including Katima Mulilo, Lusaka in Zambia, and the Democratic Republic of the Congo. Deliveries to these two northern corridors account for 76% of all common delivery destinations, providing significant validation for the installation of truck stops in this region.

The need for a truck stop on the B1 N is also supported by data indicating the corridors on which drivers tend to stop for rest or services along their route, as displayed in Figure 30.



**Figure 30 - Corridor Stop Locations by Drivers Surveyed in Walvis Bay**

This shows that 62% of truck drivers surveyed make stops on the B1 N. These data make sense because there are many favorable stopping locations within 200 km of where the B1 N and the B8—the two most commonly utilized corridors for truck drivers—split. This also supports the decision to put truck stops at locations along the B1 N and the B8. While 20% of drivers make deliveries using the B8, only 4% of drivers claimed to make stops along this route, instead just driving all the way through the Caprivi Strip to Katima Mulilo before stopping. New truck stops along the Caprivi Strip will increase safety and allow drivers to comply with the driving laws.

These data notably do not represent drivers using the B6 corridor on their way to Gobabis and Botswana. This is due to the fact that none of the drivers we surveyed were making deliveries in this direction, and we were not able to thoroughly conduct our survey in Gobabis when we traveled there. We understand that this is not an accurate representation of truck driver traffic on the B6, but believe that the data still is valid to represent the volume of traffic on the other corridors.

These data indicate high traffic on the corridors we have identified as necessary locations for truck stops. Also, due to the large number of drivers using the B1 N and the B8,

it is reasonable to suggest that a truck stop is needed at a location before these corridors split, and also at a location after the split on each respective route. Since Windhoek is a major destination along the B2 and also a central location for all corridors, it would be an ideal location for a truck stop.

#### 4.2.2 TRUCK DRIVING HOURS

As discussed in section 2.7.4, a section of the traffic regulations of Namibia state that drivers can only drive for five continuous hours before being required to rest for 30 minutes. As shown in Figure 31, half of the drivers surveyed would be in violation of the driving laws by traveling over five hours before stopping. From our interviews with the drivers, we found that the main reasons why truck drivers do not stop are because the places lack secure parking, good food, and clean facilities. Installing truck stops that meet these three criteria would entice truck drivers to comply with the driving laws when they become enforced. Though the laws are not enforced now, truck drivers will have to stop when these laws take effect. For this reason, providing secure truck stops for them would be ideal.

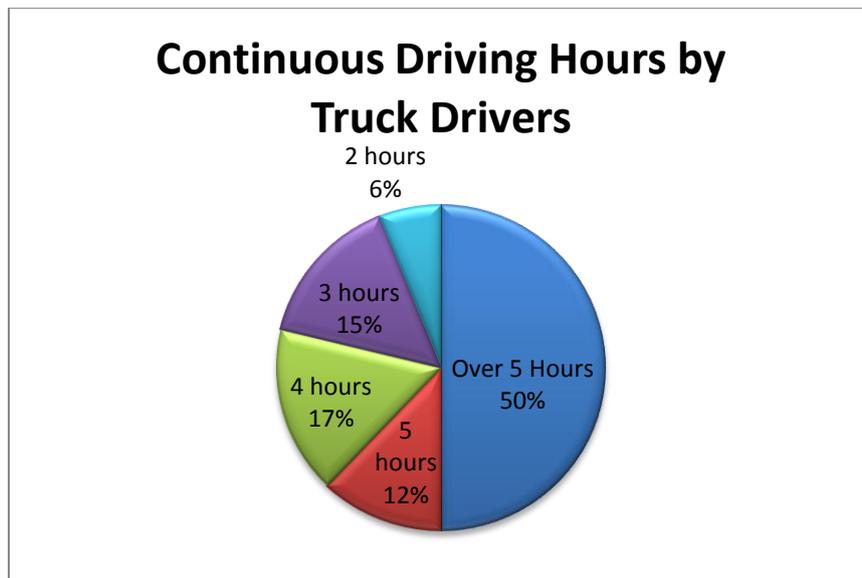
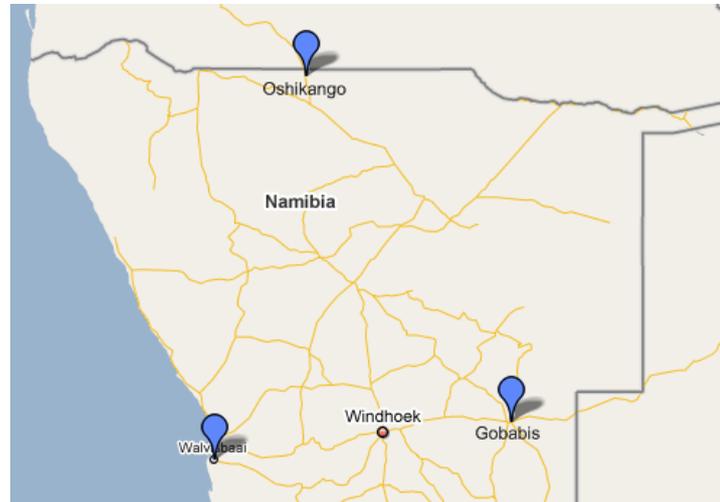


Figure 31 - Continuous Driving Hours by Truck Drivers in Namibia

#### 4.2.3 PRE-DETERMINED LOCATIONS

Based on previous studies, the WBCG had already determined three locations in which truck stops should be installed in Namibia. The locations they identified were Walvis Bay, Oshikango, and Gobabis. They also identified Lusaka in Zambia, but analyzing a location in another country was beyond the scope of our project.



**Figure 32 - Map of Pre-determined Locations**

Figure 32 shows the relative locations of these towns in northern Namibia.

Analysis of the current state of the transportation infrastructure strongly indicated the need for a truck stop in Walvis Bay. Extensive expansion of the port, previously described in section 2.7.3, should be completed in 2012. This will result in more shipping through the port, which will consequently result in more truck traffic along the corridors leading to and from the port. Currently, when trucks make a delivery to the port or arrive to pick up a container, they must wait for long periods of time to process their shipments. This leads to trucks parking on the sides of the roads, causing congestion in and around the port. To solve this problem, a truck stop should be built in Walvis Bay.

Gobabis is 108 km away from the border with Botswana, but it is the last major town on the Trans-Kalahari before crossing the Kalahari Desert. This makes it the last stopping opportunity for truck drivers before they must drive all the way to the border with Botswana. The placement of a truck stop here would allow truck drivers a place to rest before driving through the Kalahari Desert. Our survey data did not reflect high traffic along this corridor,

but this is likely due to the lack of questionnaires completed in this region. We know that this corridor is receiving heavy traffic flow due to its increased use as a route to deliver to Johannesburg, South Africa. About 50% of deliveries to Johannesburg are now made through the Trans-Kalahari Corridor as a result of improvements to this road, and the WBCG projects this number to increase to about 70% as it grows in acceptance among truck drivers. All of these factors contribute to making Gobabis a key location for the installation of a truck stop.

Our results also strongly support the installation of a truck stop in Oshikango. Not only is this the location that receives the most shipments from the Port of Walvis Bay according to our survey and data given to us by Namport, but it is located right on the Namibia-Angola border. Due to the multiple-day wait required to get through customs before entering Angola, a truck stop in Oshikango would be highly utilized. Additionally, many drivers typically drive all day and then rest once they make a delivery. As Oshikango is the final destination for many drivers, this makes it a location in which numerous truck drivers stop. Figure 33 below, which shows the top delivery data from our truck driver survey, indicates that Oshikango is a very popular location to which truck drivers often deliver.



**Figure 33 - Top Delivery Locations by Truck Drivers**

There is only one existing service station in Oshikango and no dedicated parking areas, which causes most trucks to park on the sides of the roads, as shown in Figure 34. This creates



**Figure 34 - Trucks parked on the side of the road in Oshikango**

enormous congestion within the town. A truck stop in this location would dramatically improve this situation. Trucks would no longer need to park in the streets, drivers and their cargo would be much safer from theft and vandalism, drivers would have a place to relax while

waiting to be cleared by customs, and it would provide another diesel service station for the area. The WBCG’s assertion that this was an ideal location for a truck stop was also validated by Bertie Opperman from Van der Walt Transport, who reported that he is already in the planning stages of building his own truck stop there.

Although Lusaka is located in Zambia, it is also an important stop for truck drivers. This city is situated en route to the Democratic Republic of Congo and other land-locked countries in southern Africa, so it is a strategic location to install a truck stop. The WBCG had originally wanted to propose a new truck stop in Katima Mulilo at the Namibia-Zambia border, but upon discovering that secure parking already exists there, they decided that Lusaka would be a more strategic location. Based on our research, however, we feel a truck stop should be built in Katima Mulilo as well, as will be discussed in section 4.2.5.

#### 4.2.4 ADDITIONAL TRUCK STOP LOCATIONS

Based on our research, it was evident that truck stops are necessary at Walvis Bay and the Namibian borders along the corridors due to the long wait times that drivers tend to encounter there. Additionally,

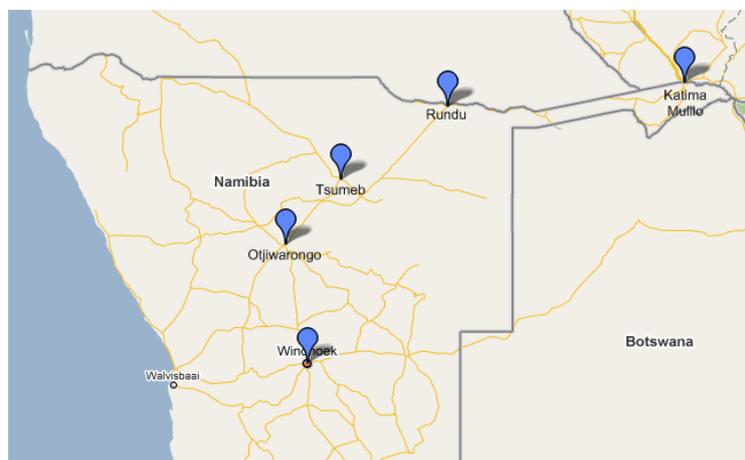


Figure 35 - Map for Additional Truck Stops

to allow truck drivers to abide by new driving laws and to provide them with a more effective distribution of services along their routes, truck stops must also be installed in other locations between Walvis Bay and the border towns. It is also important to have locations for rest and refueling for truck drivers when they reach their shipment destinations, so truck stops should be installed at the most frequent final destinations as well. Our research and survey of truck drivers gave us a large amount of data describing where truck drivers currently prefer to stop for rest. Using this information and the knowledge gained from transport companies, we determined ideal locations for the construction of truck stops, while abiding by the new driving hours laws. We determined that Otjiwarongo, Windhoek, Tsumeb, Katima Mulilo, and Rundu were effective locations to place truck stops. Figure 35 above maps the relative

locations of the towns we identified. See Figure 33 in section 4.2.1 for the results of the complete set of delivery data from the survey. Figure 36 below shows the complete set of stopping data.



**Figure 36 - Top Stopping Locations by Truck Drivers**

We contacted service stations in the towns identified for additional truck stops in order to assess their expansion capabilities. Appendix S shows the list of service stations from these towns that we contacted. The complete map of all service stations that we created first can be found in Appendix T, and the list of all stations on the map can be found in Appendix U.

Otjiwarongo was selected as a prime location for a truck stop, as we found it to be the town most frequently visited when truck drivers stop to rest. It is located 248 km from Windhoek, 403 km from Walvis Bay, and 488 km from Oshikango, the most popular truck driver destination. It is also located before the Trans-Cunene and Trans-Caprivi corridors split apart, so drivers traveling in either direction can easily utilize it. Using the method described in section 3.3.2, we evaluated the five service stations in Otjiwarongo.

**Table 4 - Feasibility Analysis of Otjiwarongo Service Stations**

<b>Company</b>	<b>Station Name</b>	<b>Land Available</b>	<b>Corridor Access</b>	<b>Diesel Fuel</b>	<b>Outskirts of Town</b>	<b>Suitable</b>
Caltex	Von Baum's Motors	NO	2km	YES	?	NO
Engen	Jakaranda Service Station	NO	On	YES	?	NO
Engen	Marina Toyota CC	YES	On	YES	?	MAYBE
Shell	Northgate Service Station	NO	"Not far"	YES	?	NO
Total	Total Hakahana	YES	?	YES	?	MAYBE

As is shown in Table 4, two of these service stations may be suitable for expansion into truck stops. None of the workers at any of the service stations we contacted in any towns understood what we meant by the question about the outskirts of town, so this column contains question marks for all service stations in all towns.

The results of our survey indicated that Windhoek was the second most popular delivery destination in Namibia for shipments from Walvis Bay. There is already the Windhoek Truckport south of the city to support the drivers that make deliveries in Windhoek or stop there on their way to Botswana or South Africa. However, with the expansion of the Port of Walvis Bay and the projected increasing number of goods to be transported through Namibia, the existing truck port may not be able to adequately service all truck drivers. Expanding this truck port into a full-service truck stop will greatly benefit truck drivers. There is an expansive area of open land adjacent to the truck port that could be utilized for this expansion. Adam Boshoff, owner of the Windhoek Truckport, already has plans to expand, so these plans should be compared with the recommendations of this report to ensure that it is consistent with what is desired and necessary along the corridors.

Tsumeb is the last major town heading north on the Trans-Cunene Corridor towards Oshikango. It is also a major stop for truck drivers according to our survey results, which suggest that it is a very popular stopping location, making it an ideal location for a truck stop.

Although Otavi ranked as a higher frequency stopping location in our survey results, we selected Tsumeb because Otavi is close to the previous stop, Otjiwarongo. Tsumeb is 312 km from the Namibia-Angola border and 176 km from the previous stop at Otjiwarongo. We contacted two service stations in Tsumeb, one of which may be suitable for expansion, as displayed in Table 5.

**Table 5 - Feasibility Analysis of Tsumeb Service Stations**

<b>Company</b>	<b>Station Name</b>	<b>Land Available</b>	<b>Corridor Access</b>	<b>Diesel Fuel</b>	<b>Outskirts of Town</b>	<b>Suitable</b>
Caltex	Martins Motors	NO	?	YES	?	NO
Engen	La Platz Service Station	YES	On	YES	?	MAYBE

Katima Mulilo is the main stop before the Namibia-Zambia border, where almost all surveyed drivers delivering to the Democratic Republic of the Congo stop. According to information gathered from Bertie Opperman of Van der Walt Transport, there is secure parking in Katima Mulilo already, making it an effective area to install additional services for drivers. As Katima Mulilo is on the border with Zambia, it should be a full-service truck stop. We were able to contact three service stations in this town. As Table 6 describes, two of these may be suitable for expansion into truck stops.

**Table 6 - Feasibility Analysis of Katima Mulilo Service Stations**

<b>Company</b>	<b>Station Name</b>	<b>Land Available</b>	<b>Corridor Access</b>	<b>Diesel Fuel</b>	<b>Outskirts of Town</b>	<b>Suitable</b>
BP	Katima Service Centre	NO	?	YES	?	MAYBE
Total	TrenTyre	NO	?	YES	?	MAYBE
Shell	Zambesi Shell	YES	500m	YES	?	NO

Although Rundu is not represented in our survey results as a popular place for drivers to stop, it would be an important location for a truck stop due to driving hour laws. It is over 539 km from Rundu to Katima Mulilo and 451 km from Otjiwarongo to Rundu. If there were no stop in Rundu then drivers would have to drive 990 km from Otjiwarongo to Katima Mulilo without a secure place to rest. Not only would this be unsafe, but it would violate the

driving hour laws, which supports the necessity of a truck stop in Rundu. As Table 7 shows, we were able to contact one service station in Rundu. It did not meet the necessary criteria and was ruled out for expansion, so Rundu must be examined for a new truck stop location that still meets the criteria described.

**Table 7 - Feasibility Analysis of Rundu Service Stations**

<b>Company</b>	<b>Station Name</b>	<b>Land Available</b>	<b>Corridor Access</b>	<b>Diesel Fuel</b>	<b>Outskirts of Town</b>	<b>Suitable</b>
Shell	Pupkewitz Toyota Rundu	NO	Not far	YES	?	NO

### **4.3 EFFECTS OF TRUCK DRIVER SAMPLING**

As our data were collected at only a small number of locations, the data for cities in which drivers stop is not truly representative of all traffic along the Walvis Bay Corridors. This skewing of the data occurred because many of the drivers we surveyed were destined for cities along the Trans-Cunene Corridor. This can be attributed to the 38% of our surveys that we collected in Oshikango and at the Windhoek Truckport. Oshikango is the last Namibian city on the Trans-Cunene, so any driver surveyed there was giving data for that corridor. Although the Windhoek Truckport can serve all corridors as it is a central location, the problem we encountered was that we were only able to collect questionnaires there from drivers headed north on the Trans-Cunene that day. Because we used convenience sampling at only a small number of different locations, the data are skewed in favor of destinations along these routes. This is especially true because we were unable to conduct a representative survey in Gobabis.

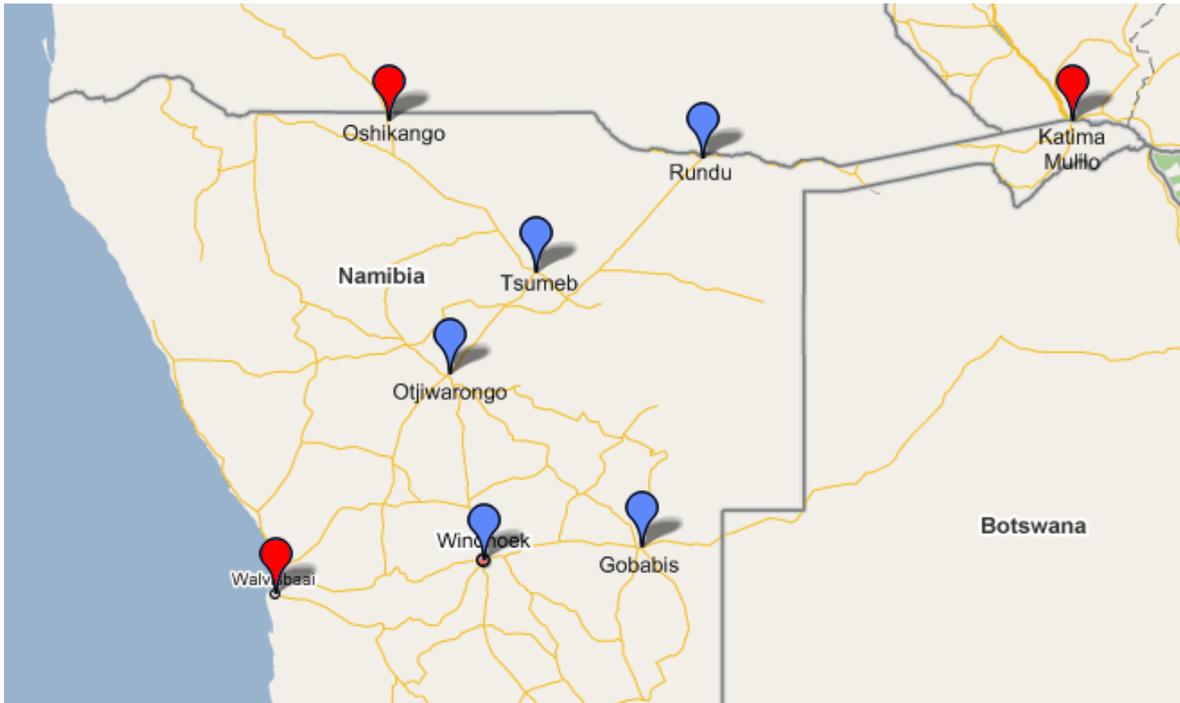
During our trip to the Port of Walvis Bay, 19 of the 40 drivers surveyed also had destinations along the Trans-Cunene. Although the port serves all possible routes throughout Namibia, almost half of the drivers surveyed were destined for Oshikango during our visit. This could be because many of the trucks were receiving shipments from the same vessel, and perhaps survey results on a different day would have yielded different results.

## 4.4 ECONOMIC ANALYSIS

An important aspect of planning the creation of truck stops is the economic analysis of costs and profits associated with constructing and operating a truck stop. Due to our lack of a formal business plan with actual investors, it was impossible to gather information about most of the important costs, including construction and security. As a result, we were unable to conduct an analysis of these costs. Some of the information we were able to gather about costs is presented in Appendix DD, which features the information we were able to gather from the Cool Ideas Truck Stop in South Africa. Our recommendation on how to gather the necessary data, once a formal business plan is developed, can be seen in section 6.1.

## 4.5 SUMMARY

Using our survey of truck drivers in Namibia, interviews with various transport company officials, truck stop owners, and other interested parties, we developed a plan for the installation of numerous truck stops along the Walvis Bay Corridors. We determined that new or expanded truck stops should be located in Oshikango, Katima Mulilo, Rundu, Tsumeb, Otjiwarongo, Windhoek, Gobabis, and Walvis Bay. Figure 37 maps the relative locations of all of these towns in Namibia. The truck stops near the borders (indicated in red on the map), such as Oshikango, Katima Mulilo, and Walvis Bay, should be larger, more fully serviced stations with lodging and restaurant facilities, since these are places where truck drivers may remain for longer periods of time. We also realized that lack of security is the biggest problem for truck drivers, so we recommend that all truck stops would make the necessary provisions.



**Figure 37 - Map of all identified locations**

## 5. CONCLUSIONS

After completing our research, we came to several conclusions to present to the Walvis Bay Corridor Group. We determined the services that should be available at truck stops as well as the relative importance of each service. We also validated the need for truck stops in the locations proposed by the WBCG and determined the most effective locations in which additional truck stops ought to be installed. Finally, we created a basic method by which the WBCG can analyze service station expansion capabilities in the future.

### 5.1 TRUCK STOP SERVICES

As per our project goals, we determined what services truck stops should feature. The following list presents the services in order of descending importance based on the results of our survey. We based this ranking on increasing incidence of “never” responses.

1. Showers
2. Toilets
3. Take-away
4. Convenience store
5. Diesel Fuel
6. Maintenance garage
7. Leisure and entertainment
8. Health wellness centre
9. Banking (ATMs)
10. Restaurant
11. Bed & breakfast
12. Payphones

All truck stops should be required to have secured parking areas as well. Ideally, all of these services should be available at all truck stops except the bed and breakfasts and restaurants, which need not be available in locations in which drivers do not typically stay for long periods of time. Additionally, health wellness centres may not be as full-featured at secondary truck stops. However, in cases in which funders have financial constraints that prohibit the installation of all services, the services should be included in order of importance.

## 5.2 TRUCK STOP LOCATIONS

From analysis of our stopping data, we concluded that Otjiwarongo, Tsumeb, and Katima Mulilo would be ideal locations for truck stops. From additional research, we concluded that Rundu should also feature a truck stop in order to allow truck drivers to be in compliance with Namibia's driving hours laws once they go into effect. From the delivery destination data, we also determined that the Windhoek Truckport should be expanded in the future to accommodate any growth of traffic. As the owner of the truck port, Adam Boshoff, is already planning for expansion, this particular conclusion is inherently validated.

We also validated the need for truck stops in locations previously determined by the WBCG. Walvis Bay and Oshikango need truck stops due to the large number of trucks in these areas and the length of time trucks remain there. Gobabis needs a truck stop as it is the last main stopping point for drivers before crossing the Kalahari Desert in Botswana.

To summarize, we concluded that full-service truck stops should exist in the following locations:

- Walvis Bay
- Oshikango
- Katima Mulilo

Secondary truck stops lacking some of the less important services, such as bed & breakfast and restaurant, should be located in the following locations:

- Otjiwarongo
- Tsumeb
- Rundu
- Gobabis
- Windhoek

### 5.3 METHOD FOR ASSESSING EXPANSION CAPABILITY

We developed a simple set of criteria for determining expansion capabilities of service stations. Table 8 is included here for convenience, but it is just a copy of Table 3 from section 3.3.2.

**Table 8 - Feasibility of Service Station Expansion**

<b>Feasibility of Service Station Expansion</b>	
<input type="checkbox"/>	Service station currently has adjacent land available
<input type="checkbox"/>	Service station has easy access to a corridor (Less than 1 km from corridor)
<input type="checkbox"/>	Service station is on the outskirts of town (Trucks do not need to drive through the centre of an urban area to receive services)
<input type="checkbox"/>	Service station has diesel fuel available
All conditions must be met in order for a service station to be considered feasible for expansion. If all conditions are not met, it is recommended to build a new facility in a more suitable location closer to the corridor.	

This simple set of criteria rates what is truly important when selecting a potential site for expansion of a service station. An existing service station could already have every service available except a parking area, but have no room for expansion. Alternatively, a station might be inconveniently located in the middle of a town, forcing large trucks to travel along roads not suited for such traffic. While individual station sites should be visited before making any final decisions, satisfying these basic criteria should ensure very effective expansion locations. In the event that no stations in an area satisfy these criteria, a new facility should be created.

## 5.4 STATIONS FOR RENOVATION

Through our research, we discovered that the following service stations are potential candidates to be renovated into truck stops in the future. These are stations that offer diesel fuel, have easy access to the corridors, and are adjacent to vacant land.

Katima Mulilo:

BP Katima Service Centre

Total TrenTyre

Tsumeb:

Engen La Platz Service Station

Otjiwarongo:

Engen Marina Toyota CC

Total Hakahana

Rundu notably did not have any service stations suitable for expansion, so a new facility should be constructed there. Further investigation into the service stations above to determine whether or not they are located on the outskirts of towns must still be conducted, as we were unable to determine whether any service stations met this criterion. If none of the stations prove to be suitable upon further investigation, then new facilities should be constructed in these locations as well.

## 5.5 BENEFITS OF TRUCK STOP IMPLEMENTATION

The implementation of a truck stop system along the corridors in Namibia has the potential to generate numerous benefits for all parties involved in the goods transportation industry. The proposed system would greatly enhance the nation's transportation infrastructure, especially in terms of safety. This benefit will improve the situation for truck drivers, transport companies, and other companies looking to receive their shipments safely and on time. It will also offer significant economic gain to those who fund and manage them.

### **5.5.1 BENEFITS FOR TRUCK DRIVERS**

The current situation for truck drivers is far from ideal. Truck drivers tend to stay on the road longer than recommended, both because they are under time constraints and also because they need to reach a safe parking area before stopping. These factors result in fatigued truck drivers and drivers continuing their journey late into the night in an unsafe environment. The laws described in section 2.7.4 will soon take effect, requiring drivers to stop for rest. At the moment, however, there are still few suitable locations for them to stop. The implementation of this truck stop system will give truck drivers a safe environment for them to stop and rest.

The truck stops described in this report will supply truck drivers with a variety of services in one convenient location. Of chief importance among these are new secured parking areas. With the abundance of crime and vandalism facing truck drivers today, this will certainly be a welcome addition to the corridors for truck drivers, transport companies, and even the companies that receive shipments as well. These truck stops will provide truck drivers with other necessities, such as a store to purchase food and drinks, a maintenance garage for truck repairs, fuel, toilets, showers, and other miscellaneous necessities. The availability of these services will dramatically improve the working lifestyle of truck drivers, making it much less strenuous and allowing them to do their jobs more easily, efficiently, and safely.

### **5.5.2 BENEFITS FOR TRANSPORT COMPANIES**

A major increase in reliability for transport companies will result from the implementation of a truck stop system. The amount of stolen goods and vandalized trucks will significantly drop, consequentially giving other companies more faith in their shipment transportation ability, resulting in more business. This system will also keep their most valuable resources—their employees—safer and more content while working. However, this

will only be helpful if the transport companies are adamant about enforcing the driving laws and requiring their drivers to stop at these specialized locations.

### **5.5.3 BENEFITS FOR MUNICIPALITIES**

Truck stops would positively affect the municipalities in which they are constructed. Having a dedicated parking area for all of the trucks would keep truck traffic and all of their side-effects, including noise pollution, out of the municipality. The space trucks currently take up by parking along the sides of the roads would decrease, easing congestion on commercial and residential roads. Passenger vehicles would be dramatically less obstructed by large trucks, which tend to create blind spots. Traffic congestion would decrease, and the flow of traffic would be safer and more efficient due to the lack of trucks parked along the roads in the municipality.

### **5.5.4 BENEFITS FOR FUNDERS**

A truck stop business venture is one that is likely to yield significant profits to any and all investors. Truck drivers emphatically agreed that they would utilize a safe, clean, friendly facility to rest, and transport company officials agreed that they would have their drivers stop at them. According to our truck driver survey, the vast majority would utilize the services that are to be provided. During the time they are stopped, they will buy food and supplies from the convenience store, pay for repairs at the garage, and purchase diesel at the fuel pumps. Most, if not all, of what they buy will be from the truck stop, if it is fairly priced. Drivers are unlikely to be willing to venture too far from their trucks to make their purchases.

## **6. RECOMMENDATIONS**

Our research identified many issues that we believe should be investigated further. This chapter of the report identifies recommendations that we believe the WBCG should consider addressing in the future.

### **6.1 TRUCK STOP ECONOMIC ANALYSIS**

When we approached truck stop owners, transport company representatives, and representatives of companies that offer the services mentioned in this report asking for cost and profit information, they were unwilling to reveal specific information. However, when a truck stop plan is developed and a team of business owners that will provide services, such as fuel, tyres, maintenance/repairs, etc., are committed to investing, they will be able to determine individual cost and profit data for the majority of the aspects of the truck stop.

A thorough economic analysis should focus on costs of construction of the facility and its equipment, costs of all required utilities, costs of security, maintenance, and other contracts, and numerous other operational costs. There are professionals called Quantity Surveyors in Namibia which can analyze many of the construction costs. We recommend a Quantity Survey be hired to determine how much the facility will cost to construct. Additionally, economic analysis should also determine the benefits that will result from these costs. Profitability specifically should be examined. This information can then be used to encourage funders to support the truck stop project.

### **6.2 FUTURE TRUCK STOP LOCATIONS**

This project focused on analyzing and developing the infrastructure for the northern part of Namibia. There are, however, other areas in which improvement would be beneficial to truck drivers and transport companies. Due to the large number of truck drivers stopping in

Zambia, Keetmanshoop, and Mariental as evidenced by our survey results, we recommend that future analysis be conducted and development of these locations be considered as well.

### **6.2.1 LUSAKA, ZAMBIA**

One important piece of information we gained from interviewing truck drivers was that the infrastructure in Namibia is already much better than that of many of the surrounding countries. They claimed that building truck stops in other countries would be extremely beneficial. The WBCG already has an office in Zambia, which could facilitate the planning of a truck stop in Zambia's capital, Lusaka. A stop here would also be beneficial to drivers who pass through Zambia to make deliveries to the Democratic Republic of Congo. Unfortunately, the WBCG does not have as much influence in other countries like Angola, which—according to truck drivers—needs truck stops the most.

### **6.2.2 SOUTHERN NAMIBIA**

Though our research focused on the northern corridors of Namibia, we also collected data suggesting that many truck drivers travel into South Africa. These data demonstrated a need for truck stops in Namibia on the southern corridors. From Kobus Engelbrecht at Namport, we were able to obtain information regarding where certain goods going through Walvis Bay are delivered to and also what goods are delivered to Walvis Bay from specific locations. This information contained a list of tonnage and number of containers shipped to and from Walvis Bay in 2008. The important data concerning the SADC region's goods transported by road can be found in Appendix FF and Appendix GG. The data show that the southern corridors, the Trans-Oranje and Trans-Kalahari, are key to the transportation of goods to South Africa. Although these data need to be further analyzed, a preliminary analysis supports the need for truck stops along those corridors.

In addition, the law states that drivers must rest for 30 minutes for every five hours of driving. For the southern corridors, this means that a stop in Mariental, which is 265 km

from Windhoek, would be an optimal location. Further justification for this location includes data suggesting that 7% of drivers surveyed currently stop in Mariental on their routes, making it the 6th most popular stopping location from our survey.

To complement this and to meet the requirements set by the driving laws, a truck stop would also be important in Keetmanshoop. This town is 228 km from Mariental. Currently, 8% of the drivers surveyed stop in Keetmanshoop while making deliveries, making it the 7th most popular stopping location. These two stops would allow drivers to cut the long drive into South Africa into thirds to make for a safer journey.

### **6.3 SERVICE STATION VISITATION**

In section 4.2.4, we identified towns with filling stations that could potentially be expanded into truck stops, rather than constructing new truck stops there. However, these locations will need to be visited in person to confirm the effectiveness of the location with respect to proximity to the main corridor, placement of the stop in the town, and suitable land available nearby for expansion. Despite having the addresses of many stations, we were unable to assess their location feasibility with maps, as we could not determine their location on long roads. This will also provide the opportunity to speak with the service station manager about the prospect of expanding the station and participating in the truck stop venture. This should be done for every filling station that is identified as having potential for expansion.

### **6.4 COOPERATION WITH CURRENT TRUCK PORT OWNERS**

Our recommendation to construct a truck stop in Oshikango was not only validated by the data we gathered from truck drivers, but also from Bertie Opperman of Van der Walt Transport. During our interview, Mr. Opperman claimed that he was planning to construct a new truck stop in Oshikango, and that he had already begun looking at available land in the

area. To ensure that Opperman's new truck stop is as useful and effective as possible, the WBCG and other interested parties should work in partnership with him to ensure that the new facilities will fit the needs and desires of truck drivers and all transport companies.

During our interview with the owner of the Windhoek Truckport, Adam Boshoff, we learned that his location is already scheduled for expansion. This is another opportunity for the WBCG to partner with the development of this truck stop to ensure that it provides the services most necessary along the corridors. If the construction and expansion of all truck stops in Namibia can be conducted under a system of cooperation with the WBCG, then improvements to the infrastructure on the corridors can be conducted more effectively and efficiently, rather than having separate parties working independently.

## **6.5 DRY PORT**

Another advancement along the corridors that could be considered that could benefit the transport industry is a dry port. A dry port is essentially the same general structure as a seaport. The main difference is that a dry port is meant to store goods until they can be transferred from a land carrier to another land carrier, while a sea port is meant to store goods until they can be transferred from a land carrier to a sea carrier or vice versa.

We recommend investigating the feasibility of a dry port in Oshikango at the Namibia-Angola border. The large number of trucks and goods being moved north that have to wait at the border to go through customs provides strong validation for such a system. This dry port would also solve many border crossing issues. If the dry port were to be built on neutral ground at the border, where both trucks from Namibia and Angola could enter to unload and retrieve cargo, then truck drivers would no longer have to wait several days for customs to clear the freight and allow passage into the other country. This project would require an extensive feasibility study to determine the likelihood that a dry port in Oshikango would be practical and possible.

## **6.6 ROAD-RAIL CONNECTION**

Another aspect of infrastructure worth looking into is the interface between the rail and the road networks for the transport of goods. The scope of our project did not allow us to look into this relationship. However, we recognize that the cooperation between rail and road systems could potentially radically increase the efficiency of the transportation of goods along all corridors leading to and from Walvis Bay. At the moment, using rail lines to transport goods to a location and then using trucks to move the goods further inland is inefficient. The current rail system is extremely limited in speed and the locations to which it can deliver. If the rail system were to be upgraded and expanded, then the union between truck stops and rail stations might become a realistic business venture.

## **6.7 SECURITY LIABILITY**

During our interview with Mr. Lombaard of the security company G4S, he brought up the issue of liability in terms of security. This may be something that transport companies, truck stop owners, and security companies will need to discuss. There should certainly be some standard rules or policies developed in terms of liability. If a truck is parked in a securely fenced and guarded parking lot and goods are stolen from the truck, the issue of liability should be clearly defined beforehand. South Africa's Cool Ideas Truck Stop accepts the liability for any theft on its property, so perhaps this policy would work at Namibian truck stops as well. Liability should still be considered when creating business plans, and an acknowledgement of liability by one party should be determined.

## **6.8 PROJECTED TRAFFIC INCREASES DUE TO PORT EXPANSION**

With the expansion of the Port of Walvis Bay to be completed in 2012, the traffic flow of trucks throughout Namibia could change dramatically. It would be wise to assess how substantial those changes will be. Examining projected traffic data for this was

something we would have liked to do, as this traffic is what will be flowing through truck stops after the port's expansion has been completed. These data may be obtainable from Namport, since they must have estimated this information for a feasibility study for the port's expansion. Unfortunately, we were not able to obtain these data in the time available.

## **6.9 INFLUENCE OF LAWS ON TRAFFIC**

It is difficult to predict the impact of new limited driving hours laws on truck traffic in Namibia and throughout the SADC region. However, we recommend that a year or two after the laws become enforced, a small-scale survey be conducted—similar to the one we conducted—to see if the truck drivers are still stopping in the same locations once the laws have been enforced. These data are important because we do not want the truck stop system to be less effective due to changing conditions. If driver habits and driving patterns have changed due to the new laws, we suggest that a larger scale study be conducted to determine new, more effective locations for truck stops using our suggested criteria for guidelines.

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## ACRONYMS & TERMINOLOGY

Funders	Banks or investors willing to put money towards as truck stop
Health Services	Term used to reference HIV/AIDS awareness, and any other medical supplies or medicine to be available at Truck Stops
MCLI	Maputo Corridor Logistics Initiative
Petrol	This is the same as “gasoline” in the United States.
SADC Region	South African Development Community. This refers to Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe, Namibia, South Africa, Mauritius, Democratic Republic of the Congo, and Seychelles.
TEUs	Twenty-foot Equivalent Units. A unit representing the volume of a twenty-foot shipping container.
Toilets	Term used to refer to what Americans would consider a “restroom.” This would be a room where there are toilets and sinks available for the public.
Truck Port	A diesel service station that can accommodate a few trucks for parking.
Truck Stop	A diesel service station specifically tailored to benefit long distance truck drivers. Secured parking, vehicle maintenance, and numerous other services are provided.
WBCG	Walvis Bay Corridor Group
Wellness Centre	Term used to reference the place where health services will be provided in the Truck Stop.

## **APPENDIX A: WALVIS BAY CORRIDOR GROUP PROFILE**

The Walvis Bay Corridor Group (WBCG) is a private commercial organization whose vision is to be the leading trade route for southern Africa (Walvis Bay Corridor Group, 2009, About Us: Vision & Mission). The Corridor Group, established in 2000, facilitates and promotes imports and exports along the corridors by providing innovative service offerings to their customers. The WBCG promotes the utilization of the Walvis Bay Corridors, which are comprised of the Port of Walvis Bay, Trans-Caprivi Corridor, the Trans-Kalahari Corridor, the Trans-Cunene Corridor, and the Trans-Oranje Corridor.

The WBCG is comprised of a number of member groups (Walvis Bay Corridor Group, 2009, Members). The group brings together public and private sector stakeholders in the transportation and logistics industries. Among the groups is the Namibia Road Carrier's Association, or Namroad, which is an organization that brokers vehicles from other members and non-members to provide the hauling capacity for shipping freight through the Walvis Bay Corridors. Another group is TransNamib Holdings Ltd., which is the only rail service provider in Namibia. This organization combines its rail services with road transport for effective delivery. The Walvis Bay Municipality is involved in the economic interests of the Walvis Bay area, which is beneficial to users of the port. Another group involved is the Roads Authority, which manages the roads in Namibia in order to provide a safe, efficient, and comprehensive network of transportation routes around the country. Other noteworthy members of the Corridor Group are government organizations including the Ministry of Home Affairs and Immigrations: Department of Immigrations; the Ministry of Works, Transport and Communication: Department of Transport; the Ministry of Finance: Department of Customs and Excise; and the Ministry of Trade and Industry: Namibia Investment Centre.

The WBCG also maintains strategic partnerships with several groups that are not specifically members (Walvis Bay Corridor Group, 2009, About Us: Strategic Missions). These include the Swedish International Development Agency (Sida), the Southern Africa Global Competitiveness Hub, the Federation of East and Southern African Road Transport Associations (FESARTA), the Sub-Saharan Africa Transport Programme (SSATP), and the United Nations Conference on Trade and Development (UNCTAD).

One important facet of the WBCG is its HIV/AIDS Help Desk, whose vision is to “create complete HIV/AIDS awareness and response capacity within the Walvis Bay Corridor Group Member Companies” (Walvis Bay Corridor Group, 2009, About Us: WBCG HIV/AIDS Help Desk). Launched in March 2003, it aims to address HIV/AIDS issues specifically in the transport sector and support the implementation of comprehensive workplace programs within member companies. The Help Desk is responsible for facilitating, designing, monitoring, and implementing numerous HIV/AIDS awareness campaigns and education programs in member workplaces. As HIV/AIDS is thought to be prevalent among workers in the transport sector, this department is of particular importance, and it represents a significant role in this project.

The work done by the WBCG to maintain and improve the Walvis Bay Corridors, including by commissioning this project, ensures that Namibia’s transportation routes through the country remain safe, efficient, and reliable. If one facet of a nation’s wealth is measured by the value of trade across its borders, the work done by the WBCG helps to significantly increase the wealth of Namibia.

## **APPENDIX B: PRELIMINARY SURVEY**

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## Truck Driver Survey

This survey is being conducted to create a plan to implement a truck stop system in Namibia.

1. How many hours do you typically drive without stopping?

- 2 hours or less                       4 hours                       6 hours  
 3 hours                                       5 hours                       7 hours or more

2. How many kilometers do you typically drive before stopping?

- 200 km or less                       400 km                       600 km  
 300 km                                       500 km                       700 km or more

3. How often do you stop specifically for each of the following services?

	Never	Sometimes	Most Times	Every Time
Take-away food and beverage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency vehicle repairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle maintenance services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Banking (ATMs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. How frequently would you use each of the following services?

	Never	Sometimes	Most Times	Every Time
Take-away/convenience store	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leisure & entertainment (TV, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Where do you most often sleep during your trips?

	Never	Sometimes	Most Times	Every Time
In your truck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At a bed & breakfast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hotel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Residence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. How many times during the past year have you been stranded due to mechanical failure? \_\_\_\_\_

7. Have you ever had health problems when driving? What health services did you need?

\_\_\_\_\_

8. What is your average distance traveled per trip? \_\_\_\_\_ km

What is your average total distance traveled per month? \_\_\_\_\_ km

What city is the destination of your current shipment? \_\_\_\_\_

What 3 cities do you ship to most often?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

## **APPENDIX C: TRUCK DRIVER SURVEY**

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## Truck Driver Survey

**This survey is being conducted to create a plan to implement a truck stop system in Namibia.**

1. How many hours do you typically drive without stopping?

- 2 hours or less                       4 hours                       6 hours  
 3 hours                                       5 hours                       7 hours or more

2. How many kilometers do you typically drive without stopping?

- 200 km or less                       400 km                       600 km  
 300 km                                       500 km                       700 km or more

3. How often do you use the following services when you stop?

	Never	Sometimes	Most Times	Every Time
Take-away food and beverage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle maintenance services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Banking (ATMs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. How often would you use the following services when you stop if they were made available at truck stops along the corridors?

	Never	Sometimes	Most Times	Every Time
Take-away/convenience store	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bed & breakfast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leisure & entertainment (TV, darts, pool)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. If your truck was securely guarded, would you still see the need to sleep in the truck overnight? \_\_\_\_\_

6. How many times during the past year have you been stranded due to mechanical failure? \_\_\_\_\_

7. What are some sicknesses or injuries truck drivers may get while driving? How do they deal with it?

\_\_\_\_\_

8. What is your average distance traveled per trip one way? \_\_\_\_\_ km

What is your average total distance traveled per month? \_\_\_\_\_ km

What city is the destination of your current shipment? \_\_\_\_\_

What towns along the route do you usually stop in for any of the above services?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

What 3 cities do you ship to most often?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

## APPENDIX D: MONTANA REST AREA USER AMENITY SURVEY RESULTS

Montana Department of Transportation (Blomquist and Carson, 1998, p. 41-43).

<b>Amenity Importance Ranking</b>	<b>Rank</b>	<b>Average Rating</b>
Trashcans	1	2.61
Parking Lot/Pathway Lighting	2	2.59
Year-round Access (Restroom Facilities)	3	2.54
Sufficient Restroom Stalls	4	2.54
Year-round Access (Parking)	5	2.51
Drinking Fountains	6	2.46
Sufficient Automobile Parking	7	2.46
Paper Towels	8	2.39
Weather, Road Condition, Traffic Info	9	2.35
Sufficient Telephones	10	2.33
Building/Shelter Design	11	2.31
Grounds/Landscaping	12	2.29
Sheltered Picnic Areas	13	2.29
Sufficient Truck/RV Parking	14	2.24
Historical, Interpretive Points of Interest Info	15	2.22
Mirrors	16	2.21
Hot Water	17	2.20
Benches	18	2.17
Open Picnic Areas	19	2.06
Service (Gas, Food, Hotel) Location Info	20	1.97
Pet Exercise Area	21	1.90
Overnight Parking	22	1.88
Vending Machines with Snacks & Beverages	23	1.88
Rest Area Attendant	24	1.78
Diaper Changing Table	25	1.77
Visitor Center with Attendant	26	1.75
Pet Watering Troughs	27	1.75
Free Coffee or Snacks	28	1.72
RV Dump Stations	29	1.72
Vending Machines with Newspapers & Maps	30	1.71
Cooking Grills	31	1.58
Playground Equipment	32	1.57
Showers	33	1.48
Vending Machines with Cigarettes & Toiletries	34	1.44
Bicycle Racks	35	1.34

## APPENDIX E: PORT OF WALVIS BAY AND LUDERITZ STATISTICS

Cargo Handled at the Ports of Walvis Bay and Luderitz (metric tons) (Namport, 2008b, p. 17)

	Sep/Aug 02/03	Sep/Aug 03/04	Sep/Aug 04/05	Sep/Aug 05/06	Sep/Aug 06/07	Sep/Aug 07/08
<b>CARGO LANDED</b>						
Bulk and Breakbulk	344 200	449 531	414 503	488 456	568 658	595 116
Containerized	300 196	314 512	331 814	517 987	781 057	1 068 899
Sulphuric Acid	146126	220 954	206 520	177 512	290 047	381 839
Petroleum landed	744635	715 129	831 298	866 640	766 450	784 625
<b>Total</b>	<b>1 535 158</b>	<b>1 700 126</b>	<b>1 784 134</b>	<b>2 050 594</b>	<b>2 406 212</b>	<b>2 830 478</b>

<b>CARGO SHIPPED</b>						
Bulk and Breakbulk	859 930	1 037 475	990 883	810 324	995 269	990 669
Containerized	200 348	222 106	308 837	413 044	327 665	430 164
<b>Total</b>	<b>1 060 278</b>	<b>1 259 582</b>	<b>1 299 719</b>	<b>1 223 368</b>	<b>1 322 935</b>	<b>1 420 833</b>

<b>CARGO TRANSHIPPED</b>						
Bulk and Breakbulk	37 467	33 879	20 041	11 982	5 021	6 847
Containerized	9 590	138 236	307 859	317 185	502 314	432 183
<b>Total</b>	<b>47 056</b>	<b>172 114</b>	<b>327 900</b>	<b>329 167</b>	<b>507 335</b>	<b>439 030</b>

<b>Total Cargo Handled</b>	<b>2 642 492</b>	<b>3 131 822</b>	<b>3 411 754</b>	<b>3 603 129</b>	<b>4 236 481</b>	<b>4 690 341</b>
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### CONTAINERS HANDLED AT THE PORTS OF WALVIS BAY AND LUDERITZ (TWENTY-FOOT EQUIVALENT UNITS)

Landed	20 000	21 959	24 433	29 482	28 163	42 062
Shipped	20 359	19 980	23 618	27 926	28 101	36 518
Transhipped	1 057	13 073	29 559	36 777	91 970	105 025
<b>Total Teu's</b>	<b>41 416</b>	<b>55 012</b>	<b>77 610</b>	<b>94 185</b>	<b>148 234</b>	<b>183 605</b>

### VESSEL VISITS WALVIS BAY AND LUDERITZ

Number	3 304	3 187	2 399	2 439	2 384	2 509
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## APPENDIX F: TRANSPORT COMPANY INTERVIEW PROTOCOL

Mr. Van Rooyen from Wesbank Transport and Bertie Opperman Van der Walt Transport were asked these questions during separate interviews.

1. How many trucks do you own?
2. Do all of your trucks have similar servicing requirements?
3. What services and utilities are required to operate this equipment?
4. How often are trucks routinely serviced?
5. \*How much do you spend on the maintenance of trucks?
  - How much do you spend per truck per year?
6. Do drivers generally bring trucks to be serviced during their trips or are they brought in separately by the company?
7. How often do your trucks break down?
8. What happens when a driver has a mechanical failure far from any urban areas along the road?
  - How did they deal with that?
9. Do you think a towing service would be a good idea to have at truck stops?
  - How often do you think a towing service would be utilized?
10. What kinds of problems have you experienced with vandalism and theft?
11. What do you see as problems along the corridors?
12. What services do you think a truck stop should have?

\*Indicates a sensitive question that might not be asked.

## **APPENDIX G: TRUCK STOP COMPANY INTERVIEW PROTOCOL**

Bertie Opperman from Van der Walt Transport, a transport company that also operates a truck stop in Swakopmund, was asked the following questions during an interview about his truck stop.

1. How many trucks utilize the truck stop per day?
2. Is this truck stop only available to trucks you own?
3. How is your truck stop funded?
4. How do you staff your truck stop?
5. Do you hire unskilled laborers? Do they require extensive training?
6. What types of security should truck stops have? Lighting, fencing, security guards, etc?
7. What services do you provide at your truck stop?
8. What kinds of sicknesses or ailments typically occur in truck drivers and how do you deal with them?
9. What do you see as current problems along the corridors?

## APPENDIX H: TRUCKER INTERVIEW PROTOCOL

Truck drivers at various locations were asked the following questions to get a more in-depth analysis of their behavior patterns.

1. What do you typically do when you stop? Use toilets, get food, sleep, make phone calls...?
2. How often do you do use each of those services?
3. Is there anything that you cannot currently do when you stop that you wish you could?
4. Where do you eat when you are out on a trip?
5. If warm showers were available, would you use them? Why/why not?
6. What do you do for entertainment while not driving?
7. If you could sit down and watch TV, would you want to? Why/why not?
8. What types of security features would make you feel safe and secure at a truck stop?
9. Would you sleep in a bed & breakfast instead of your truck if they were conveniently available at a truck stop and your truck was guarded? Why/why not?
10. What do you do when your truck breaks down completely, to the point where you can't drive?
11. What types of health services do you think should be provided? What kinds of medications?
12. Where do you stop now?
13. Do you have any ideas for where you think truck stops should be placed?
14. Do you have any other thoughts or comments as to what you would like to see at a truck stop?

## **APPENDIX I: POLYTECHNIC OF NAMIBIA – HIV/AIDS INTERVIEW**

The following questions were directed at Lizelle Miller, a social worker at the Polytechnic of Namibia standing in as an HIV/AIDS consultant.

1. What do you think is the most effective way to educate someone about HIV/AIDS?
2. What are some common barriers to getting information across?
3. What types of health education/services do you think should be provided for the truck drivers at the truck stops?
4. Where are these materials available? At what cost?
5. How do you think we can encourage the drivers to use these services?

## **APPENDIX J: WBCG HIV/AIDS HELP DESK INTERVIEW PROTOCOL**

The following questions were directed to Edward Shivute, the head of the Walvis Bay Corridor Group's HIV/AIDS Helpdesk.

1. What services does the Help Desk currently offer?
2. How are these services currently being utilized?
3. What do you think is the most effective way to educate someone about HIV/AIDS?
4. What are some common barriers to getting information across?
5. What types of health education/services do you think should be provided for the truck drivers at the truck stops? Do you already have a plan for HIV/AIDS interventions at truck stops?
6. Where are these materials available? At what cost?
7. How do you think we can ensure that the drivers will use these services?

## **APPENDIX K: PETROL STATION INTERVIEW PROTOCOL**

Petrol station employees from Engen, Caltex, Total, BP, and Shell were asked the following questions during separate phone interviews.

I am a researcher working with the Walvis Bay Corridor Group. I just have a few questions in order to identify if your service station has the capacity to be expanded in the future.

- a. Do you provide diesel fuel for trucks?
- b. How far away from the main corridor are you?
- c. Do you have open space around your current facility for expansion?

Note: Some questions were rephrased during the calls in order to ensure the interviewee knew exactly what information was being requested.

## **APPENDIX L: SECURITY COMPANY INTERVIEW PROTOCOL**

The following questions were asked of Leon Lombaard from Group 4 Securicor (G4S).

1. What kinds of security services do you offer?
2. How should a truck parking facility be secured?
3. Can you tell us what costs would be involved in having G4S secure truck parking areas in Oshikango, Gobabis, and Walvis Bay?
4. What kinds of equipment would need to be put in place in terms of fencing/walls, lighting, gate controls, and other equipment?
5. About how much do you think all of that would cost?
6. What is the most effective type of fence to secure an area? What should be at the top of the fence? Electric wires, barbed wire, spikes, etc.?

## APPENDIX M: SERVICE STATION INFORMATION REQUEST LETTER



### Service Station Information Request



To whom it may concern:

We are a team of researchers representing the Walvis Bay Corridor Group and we are conducting a feasibility study to improve the services for truck drivers along the Walvis Bay Corridors. One of the aspects of our project is to locate all of the service stations in Namibia in order to identify where services are currently available.

We are requesting a list or map of all of your service stations in Namibia with their addresses and contact information. With this information, we may contact a small number of the stations in strategically located towns asking about the services they offer. This information is solely for the purposes of our report.

Thank you for your time.

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Anthony Laine  
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## APPENDIX N: THE ROAD TRAFFIC AND TRANSPORT REGULATIONS

Excerpt from Chapter 6 of The Road Traffic and Transport Regulations, 2001 of Namibia (Republic of Namibia, 2001).

### CHAPTER 6 MATTERS RELATING THE FITNESS OF OPERATORS

#### PART 1 OPERATOR REGISTRATION

Classes of motor vehicles in respect of which operator must be identified and registered

284. (1) An operator must be identified and registered in respect of -
- (a) a goods vehicle with a gross vehicle mass exceeding 3 500 kilograms;
  - (b) a breakdown vehicle;
  - (c) a bus;
  - (d) a minibus -
    - (i) with a gross vehicle mass exceeding 3 500 kilograms; or
    - (ii) which is designed or adapted to convey 12 or more persons including the driver;
  - (e) any other motor vehicle used to convey persons for reward; or
  - (f) a motor vehicle contemplated in Part 4 of this Chapter.
- (2) Subregulation (1) does not apply to a motor vehicle referred to in subregulation (1) that is -
- (a) operated on a public road under the authority of a temporary or special permit, or motor trade number, as the case may be; or
  - (b) not operated on a public road and for the purpose of this paragraph, the words “operated on a public road” may not be construed to include the presence of the motor vehicle on a public road for the purpose of -
    - (i) being driven to the premises of the owner in order to take delivery thereof; or
    - (ii) crossing a public road from one premises of the owner to another;
  - (c) a trailer drawn by a tractor.

Categories of operator cards

285. (1) An operator card must be issued for a goods vehicle category, passenger vehicle category or dangerous goods vehicle category.
- (2) An operator card for the -
- (a) goods vehicle category must be marked with the letter “G”;
  - (b) passenger vehicle category, must be marked with the letter “P”; and
  - (c) dangerous goods vehicle category, must be marked with the letter “D”.
- (3) An operator card authorises the holder thereof to operate the motor vehicle to which that operator card relates on a public road.

[...]

PART 2  
DRIVING HOURS  
*(This part is not in force yet)*

Drivers to comply with driving hours

292. (1) Subject to regulation 299, a driver of a motor vehicle of a class referred to in regulation 284(1)(a), (b), (c) and (f), may not drive that motor vehicle on a public road for a period of time exceeding the limits referred to in regulation 293.

(2) An operator or person exercising control over a driver of a motor vehicle of a class referred to in regulation 284(1), may not permit, induce, force or in any other way influence that driver to contravene the provisions of subregulation (1).

Time limits

293. (1) If a driver of a motor vehicle referred to in regulation 292(1) is not accompanied by another driver licensed to drive that motor vehicle, he or she may only drive that vehicle for a -

(a) maximum of five hours continuously; and

(b) maximum of 14 hours in a 24 hour period.

(2) A driver of a motor vehicle referred to in regulation 292(1) must rest for -

(a) a minimum of 15 minutes at any one time;

(b) a minimum of 30 minutes accumulated during a period of five hours and 30 minutes; and

(c) a minimum continuous period of nine hours in a 24 hour period.

(3) If a driver of a motor vehicle referred to in regulation 292(1) is accompanied by another driver who is licensed to drive that motor vehicle, and that other driver alternatively drives the motor vehicle, the driving time limits and resting time limits referred to in subregulations (1) and (2) apply, except for subregulation (2)(c).

(4) A driver, who drives a motor vehicle for a 14 hour period, as referred to in subregulation (1)(b), may not drive a motor vehicle referred to in regulation 292(1), alternatively subject to subregulation (2), for a continuous period of 30 hours.

(5) A driver who drives a motor vehicle referred to in regulation 292(1) alternatively as contemplated in subregulation (4), for a period exceeding 15 hours but less than 20 hours, must thereafter rest for at least 10 hours.

(6) A driver who drives a motor vehicle referred to in regulation 292(1) alternatively as contemplated in subregulation (4), for a period exceeding 20 hours, must thereafter rest for at least 12 hours.

## **APPENDIX O: WINDHOEK TRUCKPORT INTERVIEW PROTOCOL**

We asked Adam Boshoff from the Windhoek Truckport the following questions during an interview about his truck port.

1. How many trucks utilize the truck stop per day?
2. What types of security do you have? Lighting, fencing, security guards, etc?
3. What services do you provide at your truck stop?
4. How much of each service is provided?
5. Which services are provided for 24 hours a day?
6. Are the parking lots lit all the time?
7. What is the area in square meters of the parking lot?
8. How large is the plot of land used by the truck stop?
9. What is your experience with truck drivers asking for services that you don't provide?
10. What sort of health services are provided at the truck stop?
11. Do you outsource certain services to other companies to control at the truck stop?
12. What types of problems have you seen with theft and vandalism of trucks?
13. What do you see as current problems along the corridors?

## APPENDIX P: TRANSPORT COMPANY EMAIL

Sent 22 April 2009

From wbcgresearch@gmail.com

Dear Transport Company Official,

We are a team of researchers working with the Walvis Bay Corridor Group to determine the feasibility of truck stops along the corridors. We are collecting data and creating a report to convince potential funders that these structures would be beneficial to the effectiveness of the transportation industry.

We kindly ask that you please take the time to answer these three questions:

1. How much cargo do you lose to theft per year? (Please respond in money value)
2. How many trucks do you currently have in operation?
3. Would you encourage your drivers to stop at a location where there was guaranteed security?

ALL INFORMATION WILL REMAIN ANONYMOUS!

If you have any questions or concerns, please feel free to discuss them with us.

Kind Regards,

Bryan Rickard  
Brian Earley  
Craig Jones  
Anthony Laine

## APPENDIX Q: VAN DER WALT TRANSPORT EMAIL

Sent 16 April 2009

To: Bertie Opperman, Van der Walt Transport

Mr. Opperman,

This is the team of researchers from the WBCG who came and spoke with you a few weeks ago regarding a plan to install new truck stops along the corridors. In the course of our planning we realized that there is more information that would be extremely useful for our project. If you are willing and able, we would appreciate it if you could answer the following questions:

1. What operational costs are required for the Van der Walt truck stop and what are they for?
  - a. How much energy do you use per month?
  - b. How much water do you use per month?
2. What sort of health services are provided at the truck stop?
3. What types of security will you have for parked trucks at the truck stop when you build the new parking lot?
  - a. Will you have security fencing?
  - b. Will you have security guards?
4. Are/will the parking lots be lit all the time?
5. What will be the area in square meters of the new parking lot?
6. How large is the total plot of land used by the truck stop, including the new lot?

If you would like to discuss these questions over the phone or in person, we will be in Swakopmund on Saturday, but we will be busy from 14:00-17:00.

Thank you again for you support and assistance.

Regards,  
Craig Jones  
Brian Earley  
Anthony Laine  
Bryan Rickard

## APPENDIX R: COOL IDEAS TRUCK STOP EMAIL

Sent 9 April 2009

To: Karl Erichsen, Maputo Corridor Logistics Initiative

Karl Erichsen,

Good morning. Below we have compiled a list of questions that we think would be most useful for our project. If you can answer all of them it would be most appreciated, but any information you can provide us with will be incredibly useful. Thank you again for your time and assistance.

- 1) When did the Cool Ideas Truck Stop open?
- 2) What operational costs are required for the Cool Ideas Truck Stop and what are they for?
  - a. How much energy do you use per month?
  - b. How much water do you use per month?
- 3) What services does the Cool Ideas Truck Stop provide for trucks and passenger vehicles?
  - a. How much of each service is provided?
  - b. Which services are provided for 24 hours a day?
- 4) What sort of health services are provided at the truck stop?
- 5) Do you outsource certain services to other companies to control at the truck stop?
  - a. To what companies do you outsource these services?
- 6) What types of security do you have for parked trucks at the truck stop?
  - a. Do you have security fencing?
  - b. Do you have security guards?
- 7) Are the parking lots lit all the time?
- 8) What is the area in square meters of the parking lot?
- 9) How often do truck drivers use the restaurant you provide at the truck stop?
- 10) How large is the plot of land used by the truck stop?

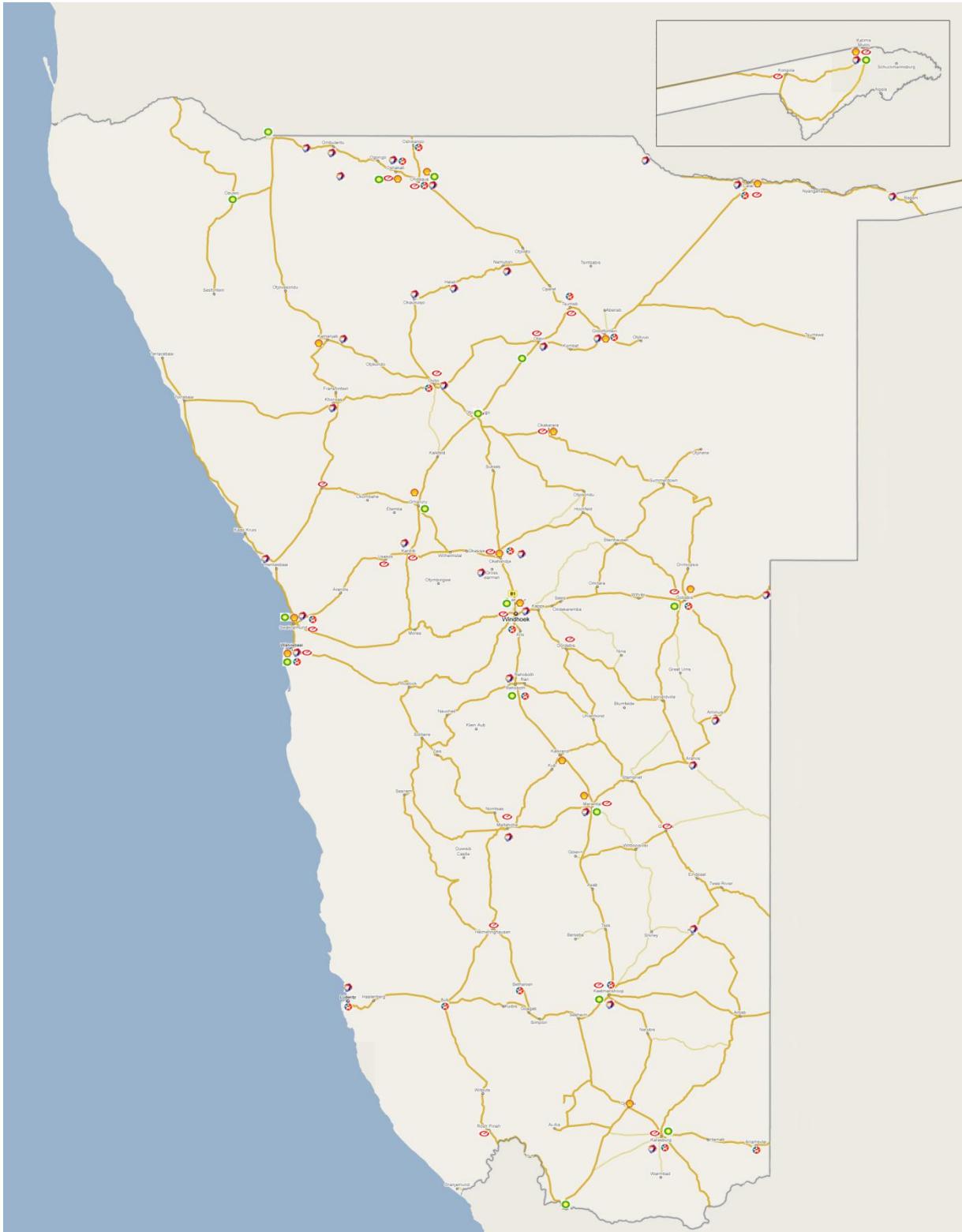
Regards,  
Craig Jones  
Brian Earley  
Anthony Laine  
Bryan Rickard

## APPENDIX S: COMPLETE SERVICE STATION LIST IN IDENTIFIED TOWNS

Petrol Company	Town	Station Name
BP	Katima Mulilo	Katima Service Centre
Engen	Katima Mulilo	Katima Truckstop
Total	Katima Mulilo	TrenTyre
Shell	Katima Mulilo	Zambesi Shell
BP	Otjiwarongo	C J's Service Station
Caltex	Otjiwarongo	Nova Tyre
Caltex	Otjiwarongo	Von Baum's Motors
Engen	Otjiwarongo	Jakaranda Service Station
Engen	Otjiwarongo	Marina Toyota CC
Shell	Otjiwarongo	Northgate Service Station
Total	Otjiwarongo	Total Hakahana
Caltex	Rundu	Paradise Service Centre
Engen	Rundu	Bangani/Divundu Service Station
Engen	Rundu	Rundu Truckstop
Shell	Rundu	Pupkewitz Toyota
Total	Rundu	Kavango Garage
Caltex	Tsumeb	Martins Motors
Engen	Tsumeb	Gateway Service Station
Engen	Tsumeb	La Platz Service Station
Engen	Tsumeb	Orbis Service Station

## APPENDIX T: SERVICE STATION MAP

This map indicates the relative locations of service stations in Namibia from Caltex, BP, Total, Engen, and Shell. When multiple stations from one company are located in a given area, the logo is still only used once.



## APPENDIX U: SERVICE STATION LIST

Below is a list of all service stations in Namibia, grouped by town, from Caltex, BP, Total, Engen, and Shell.

Petrol Station	Town	Station name
Total	Aminuis	Mauziza Service Station
Total	Aranos	Aranos Vulstasie
Caltex	Ariamsvlei	Ariamsvlei Handelshuis
Caltex	Aus	Namib Garage
Caltex	Bethanie	Bethanie Motors
BP	Buitepos	BP Kanaindo Holdings
Total	Buitepos	East Gate Service Station
Engen	Dordabis	Dordabis Trading
Caltex	Gobabis	TrenTyre, Gobabis
Engen	Gobabis	Eastern 1 stop Pegasus Service Station
Shell	Gobabis	Gobabis Service Station
Shell	Gobabis	Spandiens Motors
Engen	Gochas	Gochas Lewende Hawe
Caltex	Grootfontein	S F Motors
Shell	Grootfontein	Maroela Motors
Total	Grootfontein	Trans Caprivi Service Centre
Total	Gross Barmen	NWR
Shell	Grunau	Grunau Motors
Total	Halali	NWR
Engen	Helmeringhausen	Schnebel Repairs
Total	Henties Bay	Grobler Motors
Shell	Kalkrand	Kalkrand Service Station
Shell	Kamanjab	Kamanjab Garage
Total	Kamanjab	Northwest Gen Dealer
BP	Karasburg	Agra-Karasburg
Caltex	Karasburg	Namib Oase
Engen	Karasburg	Hanzell Service Station
Total	Karasburg	X L Garage
Engen	Karibib	Marc's Auto Service Station
Total	Karibib	Karibib Service Station
BP	Katima Mulilo	Katima Service Centre
Engen	Katima Mulilo	Katima Truckstop
Total	Katima Mulilo	TrenTyre
Shell	Katima Mulilo	Zambesi Shell
BP	Keetmanshoop	B1 Oasis
Caltex	Keetmanshoop	TrenTyre
Caltex	Keetmanshoop	VSV Service Station
Engen	Keetmanshoop	Keetmanshoop 1-stop
Engen	Keetmanshoop	Mettrek Dienststasie

<b>Petrol Station</b>	<b>Town</b>	<b>Station name</b>
Total	Keetmanshoop	Canyon Road House
Total	Keetmanshoop	Johnny's Auto
Shell	Khomasdal	Gammaburg Service Station
Total	Khorixas	Damaraland D/Stasie
Total	Khorixas	Welwitchia Service Station
Total	Koes	Van Wyk Motors
Engen	Kongola	Kongola Service Station
Caltex	Luderitz	Luderitz Bay Service Station
Total	Luderitz	Coastways Tours Service Station
Engen	Maltahohe	Marauns Garage
Total	Maltahohe	Total Spandiens
BP	Mariental	C & G Motors
Engen	Mariental	Mariental Fuel Centre
Engen	Mariental	Mariental Motors
Shell	Mariental	Hoofstraat Motors
Total	Mariental	Mariental Toyota
Total	Mukwe	Mukwe Service Station
Total	Namutoni	NWR
Total	Nkurenkuru	Nkurenkuru Filling Station
Caltex	Odangwa	SDS Filling Station
BP	Ohangwena	Jambolongondjo Garage
Caltex	Okahandja	Northern Gateway
Engen	Okahandja	Okahandja Service Station
Shell	Okahandja	Three Way Service Station
Total	Okahandja	Agent Depot
Total	Okahandja	Poolman Motors
Engen	Okakarara	Okakarara Workshop
Shell	Okakarara	Mono Motor Mark
Total	Okaukuejo	NWR
BP	Omaruru	Agra-Omaruru
Shell	Omaruru	Omaruru Engineering Works
Total	Ombalantu	Eluwa Service Station
Engen	Omuthiya	ABC Store
Shell	Onathindi	Punyu Supermarket
BP	Ondangwa	Ondjamba Service Station
Caltex	Ondangwa	Punyu Service Station
Engen	Ondangwa	Olunkono Service Station
Engen	Ondangwa	Oshinanena Service Station
Shell	Ondangwa	Eenhana Service Station
Shell	Ondangwa	Omwandi Service Station
Shell	Ondangwa	Pupkewitz Toyota
Total	Ondangwa	Melody Shop
Total	Ondangwa	Ondangwa Service Station
Total	Onesi	Onesi Service Station

<b>Petrol Station</b>	<b>Town</b>	<b>Station name</b>
Total	Ongandjera	Ongandjera Service Station
Shell	Ongwediva	Highway Filling Station
Engen	Onyaanya	Gerry's Motors
BP	Opuwo	Agra-Opuwo
BP	Oshakati	Oshana BP Service Station
BP	Oshakati	Thomas Filling Station
Caltex	Oshakati	Bona Service Station
Caltex	Oshakati	Shali's Oshivello
Engen	Oshakati	Doekels Spar
Engen	Oshakati	Oneshila Service Station
Engen	Oshakati	Ongwediva Service Station
Engen	Oshakati	Oshikuku Service Station
Shell	Oshakati	Eluwa Supermarket
Total	Oshakati	Fysal Fresh
Caltex	Oshikango	Oshikango Service Station
Engen	Oshivelo	Ekwatho Service Station
Total	Otavi	Fourways Total
Total	Otavi	Total Depot
BP	Otjiwarongo	C J's Service Station
Caltex	Otjiwarongo	Nova Tyre
Caltex	Otjiwarongo	Von Baum's Motors
Engen	Otjiwarongo	Jakaranda Service Station
Engen	Otjiwarongo	Marina Toyota CC
Shell	Otjiwarongo	Northgate Service Station
Total	Otjiwarongo	Total Hakahana
Caltex	Outjo	Weiman's Garage
Engen	Outjo	Multiplex & Tyres
Total	Outjo	EOG Service Station
BP	Rehoboth	Southline Retail Centre CC
Caltex	Rehoboth	Reo Dientsstasie
Total	Rehoboth	Echo Service Station
Engen	Rosh Pinah	TrenTyre Service Station
BP	Ruacana	Kunene Mini Market & Filling Station
Caltex	Rundu	Paradise Service Centre
Engen	Rundu	Bangani/Divundu Service Station
Engen	Rundu	Rundu Truckstop
Shell	Rundu	Pupkewitz Toyota
Total	Rundu	Kavango Garage
BP	Swakopmund	Hans Kries Motors
BP	Swakopmund	West Coast Service Centre
Caltex	Swakopmund	Crossroads Service Station
Engen	Swakopmund	Engen Swakopmund
Engen	Swakopmund	Engen Truck Port
Shell	Swakopmund	Ocean View Shell

<b>Petrol Station</b>	<b>Town</b>	<b>Station name</b>
Total	Swakopmund	Swakop Total
Caltex	Tsumeb	Martins Motors
Engen	Tsumeb	Gateway Service Station
Engen	Tsumeb	Le Platz Service Station
Engen	Tsumeb	Orbis Service Station
Engen	Uis	Brandberg Service Station
Engen	Usakos	Khan Motors
Shell	Vineta	Vineta Shell
BP	Walvis Bay	Indongo Service Station
BP	Walvis Bay	Indongo Toyota, Erongo
BP	Walvis Bay	Kuisebmond BP T/A Sashi Investments
Caltex	Walvis Bay	Carheim Investment (Pty)
Caltex	Walvis Bay	Express Service Station
Engen	Walvis Bay	E-Four Service Station
Engen	Walvis Bay	Narraville Motors
Engen	Walvis Bay	Parade Diensstasie
Shell	Walvis Bay	Alpha Service Station
Shell	Walvis Bay	Omega Service Station
Total	Walvis Bay	Suidwes Diensstasie
Total	Walvis Bay	Total Depot
BP	Windhoek	Manathan Investments CC
BP	Windhoek	Soweto Service Station
BP	Windhoek	VK Auto Electric
BP	Windhoek	Walters Motors
Caltex	Windhoek	Bach Street Service Centre
Caltex	Windhoek	Don Penda Service Station
Caltex	Windhoek	Hakahana Service Station
Caltex	Windhoek	Oshakati Service Station
Caltex	Windhoek	Pinks Filling Station
Caltex	Windhoek	Rhino Service Station
Engen	Windhoek	Academia Service Station
Engen	Windhoek	Corner Service Station
Engen	Windhoek	Emmrich Service Station
Engen	Windhoek	Hochland Service Station
Engen	Windhoek	Jan Jonker Service Station
Engen	Windhoek	Katutura Service Station
Engen	Windhoek	Klingenberg Motors
Engen	Windhoek	Monte Christo Service Station
Engen	Windhoek	Olympia Service Station
Engen	Windhoek	President Crossing Service Station
Engen	Windhoek	Subway Service Station
Engen	Windhoek	Theatre Service Station
Shell	Windhoek	East End Service Station
Shell	Windhoek	Nabta Service Centre

<b>Petrol Station</b>	<b>Town</b>	<b>Station name</b>
Shell	Windhoek	Okuryangava Filling Station
Shell	Windhoek	Soutgate Service Station
Shell	Windhoek	Tacoma Service Station
Shell	Windhoek	Tal Service Station
Total	Windhoek	Barry's Motors
Total	Windhoek	Khomasdal Service Centre
Total	Windhoek	Pionierspark Service Centre
Total	Windhoek	Riverside Service Centre
Total	Windhoek	Total Depot
Total	Windhoek	Wika Service Centre
Total	Windhoek	Windhoek Supa Quick
BP		Etunda Trust Service Station
BP		Gariiep Motors
BP		Indongo NR. 3 - Baystar

## APPENDIX V: NAMPORT INFORMATION REQUEST EMAIL

Sent 28 April 2009

To: Kobus Engelbrecht, Namport

Hello Mr. Engelbrecht,

We are students working with the WBCG team to create a feasibility report for truck stops along the corridors. We had previously been in contact with Elias Mwyeno, but he is out of office at the moment. We were wondering if you would be able to help us gather a little bit of information about the Port of Walvis Bay and the shipments that go from it. We just have a few questions and we are hoping that you will be able to answer them:

What is the total value of the goods shipped through the port? (per day or month)

Where are the most valuable goods being shipped to from Walvis Bay?

Do you have a breakdown of what goods are sent where?

Do you have a list of how many trucks leave the port to make deliveries to different locations on a daily or monthly basis?  
(for example: 40 trucks deliver to oshikango per day, 23 trucks deliver to windhoek per day)

How many containers/TEUs come in through the port? (per day or month)

How many containers/TEUs are shipped from the port? (per day or month)

How many trucks come through the port per day?

Do you have any information regarding theft of goods from trucks once they've left the port?

Do you have information regarding the value of goods stolen from trucks and where the thefts occurred?

Thank you very much for your assistance.

Regards,  
Craig Jones  
Brian Earley  
Anthony Laine  
Bryan Rickard

## APPENDIX W: ROADS AUTHORITY EMAIL

Sent 21 April 2009

To: Sophia Belete-Tekie, Roads Authority

Dear Ms. Sophie Belete-Tekie,

We are a group of researchers working with the Walvis Bay Corridor Group working to determine the feasibility of truck stops along the corridors.

We were hoping you would be able to answer a few questions we have regarding the movement of goods and trucks along the corridors:

What is the traffic volume of trucks along each of the corridors?

What is the traffic volume of trucks coming in and out of the country along the borders?

What materials are the trucks carrying?

What are the destinations of the trucks traveling along the corridors?

What is the traffic volume of trucks traveling along each of the corridors in Namibia?

What is the traffic volume of trucks leaving the country along each of the different country's borders on a monthly basis? Coming in to the country?

What materials are the trucks that travel the corridors carrying?

What are the destinations of the trucks that travel the corridors?

Do you have any information about theft occurrence in terms of dollars, percentage, and/or occurrences along the corridors in Namibia?

Especially for truck drivers.

Thank you very much for any information you can provide for us!

Kind Regards,

Bryan Rickard

Brian Earley

Craig Jones

Anthony Laine

## APPENDIX X: VAN DER WALT TRANSPORT INTERVIEW RESULTS

20 March 2009

Van der Walt Transport, Swakopmund

Interviewee: Bertie Opperman

Present: Brian Earley, Craig Jones, Anthony Laine, Bryan Rickard, Gilbert Boois

1. How many trucks do you own?
  - 52 long-distance trucks
  - 18 refrigeration trucks (reefers)
2. Do all of your trucks have similar servicing requirements?
  - All American brand trucks
3. How often are trucks routinely serviced?
  - General maintenance occurs every trip: lubricant and greasing up the truck
  - Every 20,000 km: filters need to be checked
  - Every 50,000 km: some oil systems need to be replaced
4. \*How much do you spend on the maintenance of trucks?
  - Monthly maintenance costs for reefers: R8000-R10,000
  - Monthly maintenance costs for flat decks: R6000-R7000
  - Yearly budget of R60,000 for major breakdown
5. Do drivers generally bring trucks to be serviced during their trips or are they brought in separately by the company?
  - Every town has some mechanic who works on their trucks
6. How often do your trucks break down?
  - Second-hand trucks break down all the time
  - Reefer trucks break down 3-5 times a month. Reefer truck parts are scarce: gas leak from refrigeration, compressor problems
  - No issues with flat deck trucks in the past 3 months
7. What happens when a driver has a mechanical failure far from any urban areas along the road? How did they deal with that?
  - Clients have large vehicles which can assist in towing
8. Do you think a towing service would be a good idea to have at truck stops?
  - A towing service could be an advantage, but it would not be used much
9. What kinds of problems have you experienced with vandalism and theft?
  - Vandalism and theft are problems, but much more so in South Africa
  - There is a lot of looting of things in Zambia
  - Diesel, lights, tires stolen
  - To protect themselves, drivers drive by day and keep trucks together at night
10. What do you see as problems along the corridors?
  1. Security
  2. Border Post Delays
  3. Corruption of officials – immigration and traffic control

- Trucks with valuable goods (food, cigarettes, alcohol, consumer goods) get hijacked most often
  - Siphoning of diesel
11. What services do you think a truck stop should have?
- Fences
  - Guards
  - Satellite tracking of trucks
12. How many trucks utilize the truck stop per day?
- 50-60 trucks utilize the stop per day
  - Just got approved for expansion across the street that will hold 50+ trucks with security
  - Gets trucks out of town
13. Is this truck stop only available to trucks you own?
- It is open to the public, but it only accommodates 20 trucks overnight
14. How is your truck stop funded?
- Charge for an overnight stay
  - Privately owned and funded
15. How do you staff your truck stop?
- Staffing is not an issue
  - Hire local people to be safe
  - Require minimal or no training
16. What types of security should truck stops have? Lighting, fencing, security guards, etc?
- Fenced in
  - Security officers
  - Gate security/premises security – outsourced
17. What services do you provide at your truck stop?
- Tire shop, general mechanics
  - Convenience store with necessities
  - Common medications
  - Welding shop
  - Braai/fast-food
  - Large paved area
  - Showers, toilets, cleaning
  - Overseer
  - Pool table/dart board/TV
  - Basic medication: cold, flu, hay fever
18. What kinds of sicknesses or ailments typically occur in truck drivers and how do you deal with them?
- Malaria – but truck stops do not need to deal with it, all major towns along the route have clinics that can deal with it
  - Emed – accidents are dealt with, they take care of the drivers

- Zambia is up-to-date with medical services, qualified doctors in major towns
- Drivers carry their own first aid kits with supplies

19. Other discussion:

- Katima has an Engen truck stop with good security and lighting
- Livingston has a few truck yards, but they do not deliver as much as they claim in terms of safety
- Lusaka is a problem because there is no truck stop
- Ndola has Van der Walt mechanics
- Angola is awful
- Border between Zambia and Congo is very bad
  - i. Speak French
  - ii. Bribes
  - iii. Crime, control is an issue
- Zambia and Congo are the two biggest culprits of corruption
- Weight regulations and immigration are the reasons it takes so long
- Truck stops are cheap to set up and you will make money off of them
- Opperman making his own truck stop in Oshikango

## APPENDIX Y: VAN DER WALT EMAIL CONVERSATION RESULTS

17 April 2009

Email Conversation

Interviewee: Bertie Opperman

What operational costs are required for the Swakop Engen Truck Port and what are they for?

- a. How much energy do you use per month?

*For a truck port only, it will only be for lights and hot water*

- b. How much water do you use per month?

*This is difficult to say as we do have a car wash and truck wash altogether on the site - for only a truck port you will need water for the showers and a truck wash*

What sort of health services are provided at the truck stop?

*In Swakopmund - none*

What types of security will you have for parked trucks at the truck stop when you build the new parking lot?

- a. Will you have security fencing?

*This will be determined by the municipality only as they will develop the land for parking*

- b. Will you have security guards?

*Again this will be determined by the municipality - at our premises we do have security guards throughout the night only*

Are/will the parking lots be lit all the time?

*This will be determined by the municipality only as they will develop the land for parking*

What will be the area in square meters of the new parking lot?

*We believe they will set out 2,400 - 3,000 square meters*

How large is the total plot of land used by the truck stop, including the new lot?

*We currently have only 440 square meters*

## APPENDIX Z: WESBANK TRANSPORT INTERVIEW RESULTS

20 March 2009

Wesbank Transport, Walvis Bay

Interviewee: Mr. Van Rooyen

Present: Brian Earley, Craig Jones, Anthony Laine, Bryan Rickard, Gilbert Boois, Van Rooyen

1. How many trucks do you own?
  - About 80 long-distance trucks
2. Do all of your trucks have similar servicing requirements?
  - American second-hand trucks because of availability, acceptable tail weight compared to heavier European trucks, and more reasonable fuel consumption
  - What tends to happen is that a truck is reliable up to a certain period before the parts wear out: generally 800 thousand to 1 million kilometers
3. What services and utilities are required to operate this equipment?
  - Depots in Cape Town, Johannesburg, Windhoek
4. How often are trucks routinely serviced?
  - Trucks go in for maintenance 4000 to 5000 km
  - Major service required after 20,000 km
5. \*How much do you spend on the maintenance of trucks?
  - How much do you spend per truck per year?
6. Do drivers generally bring trucks to be serviced during their trips or are they brought in separately by the company?
  - Whenever a gauge tells them to get service, they will bring the truck in to the nearest depot
7. How often do your trucks break down?
  - When a major break down occurs, it's normally due to part failure, so that is something that can be shipped out and replaced on the road
8. What happens when a driver has a mechanical failure far from any urban areas along the road? How did they deal with that?
  - Parts are usually shipped out and replaced on the road
9. Do you think a towing service would be a good idea to have at truck stops?
  - Wesbank has their own reclamation services, but it is limited to certain municipalities. Might be nice, but not necessary.
10. What kinds of problems have you experienced with vandalism and theft?
  - Hijacking and vandalism are threats, but they have modern tracking technology to monitor truck locations in Africa
11. What do you see as problems along the corridors?
  - Shortage of services/facilities along the corridors
  - Conditions of roads are deteriorating
  - Transport concentration on the roads is high

- Currency flux really hurts when you buy American parts
- Border issues take a long time to solve
- Drivers have to carry different currencies through borders to deal with corruption and bribery

12. What services do you think a truck stop should have?

- Safe stopping location
- Something for minor repairs like tire replacements and battery park chargers
- Showers and refreshment facilities
- Food

13. Other discussion:

- Truck drivers help each other out, can always get assistance from friends if tired or ill
- Cell phones are used for communication. Drivers carry a Namibian phone and a South African phone.

## APPENDIX AA: POLYTECHNIC SOCIAL WORKER INTERVIEW RESULTS

31 March 2009

Polytechnic of Namibia

Interviewee: Lizelle Miller

Present: Brian Earley, Craig Jones, Anthony Laine, Bryan Rickard

1. What do you think is the most effective way to educate someone about HIV/AIDS?
  - Visual materials: videos, pamphlets
  - Have condoms always immediately and freely available
  - Truck stops may attract prostitutes
2. What are some common barriers to getting information across?
  - People get bored with the information because it is so prevalent in the media
  - Myths
  - They think they know everything about HIV
  - Those not in contact with information much just are not interested
3. What types of health education/services do you think should be provided for the truck drivers at the truck stops?
  - Condoms
  - Information pamphlets
  - Videos
4. Where are these materials available? At what cost?
  - Materials are free
  - Government: Ministry of Health and Social Services
  - Social Marketing Association – non-governmental organizations
  - NAPPA – Namibian Planned Parenthood Association
5. How do you think we can encourage the drivers to use these services?
  - Showing videos would be perfect
  - Want to educate the ladies as well to discourage prostitution
  - Beat the Drums – educational video about the spread of AIDS
  - Have someone there trained to talk to prostitutes freely without fear of prosecution
  - Emphasize condom use
  - Alcohol abuse leads to irresponsible behavior
  - Make information short and interesting
  - Very short, to the point about protection
  - Make condoms *very* easy to get. They shouldn't have to go anywhere to buy them.

## APPENDIX BB: WBCG HIV/AIDS HELP DESK INTERVIEW RESULTS

31 March 2009

Walvis Bay Corridor Group Office

Interviewee: Edward Shivute

Present: Brian Earley, Craig Jones, Anthony Laine, Bryan Rickard

1. What services does the Help Desk currently offer?
  - Promote business along transport corridors
  - Established HIV/AIDS Help Desk as social responsibility
  - Truck drivers are the main target
  - Facilitate development of workplace programs: sign up with WBCG for N\$5000
  - Twelve transport companies in the membership right now
  - Programs involve financial commitment
  - Peer education training for selected employees
  - Sensitize managers to HIV/AIDS programs so that they do not lose their most valuable asset: employees
  - Peer educators conduct awareness sessions
  - Facilitating the process, not actually doing the programs
  - Do not do the testing themselves, just refer to appropriate service providers
  - Monitor and evaluate projects
  - Impact assessment studies
  - Main stakeholder: Ministry of Work and Transport
  - Provide pamphlets, establish health corner at workplaces
2. How are these services currently being utilized?
  - They have pamphlets and peer educators as they restock area in corner that has condoms and pamphlets
3. What do you think is the most effective way to educate someone about HIV/AIDS?
  - Build their capacity for knowledge
  - Make sure they know their HIV status
  - Participatory programs: activities that participants engage in
4. What are some common barriers to getting information across?
  - Ignorance
  - Denial – in denial about HIV status even if tested positive
  - Truck drivers away from families for up to a month
  - Prostitutes might charge N\$50 for sex with condom or N\$100 for sex without
  - Truck drivers do not want to spend a month without sex
  - You have to bring in a lot of stakeholders and make the companies aware that there are policies that they can implement
    - For example: a truck driver cannot be away from family for more than a week

- This does not happen and these policies are not present because companies and drivers need to make business
5. What types of health education/services do you think should be provided for the truck drivers at the truck stops? Do you already have a plan for HIV/AIDS interventions at truck stops?
    - Establish wellness centres at truck stops located at a border post
    - Provide information about other health issues
    - Cater to all primary health care issues
    - Ensure they are not stigmatized from the start by calling them HIV/AIDS centres
    - Produce materials they can take with them on the road
    - First aid kit (Truck Driver Toolkit)
      - First Aid on one side
      - HIV/AIDS info on other side
    - Oshikango has entertainment: B&B, football, pool tables, but also prostitutes
    - Gobabis has very little and still has ladies
    - Truck Driver Health Care Toolkit
      - First Aid Kit and HIV/AIDS materials – primary First Aid
      - Informational CDs with music and AIDS messages, leaflets, t-shirts, condoms
    - It is difficult to reach truck drivers within the workplace because they arrive early and leave for the road by 8am
    - Pamphlets, comics, CDs all directed specifically towards truck drivers
  6. Where are these materials available? At what cost?
    - Materials available from the WBCG
    - Looking for funding for the Truck Driver Health Toolkit
  7. How do you think we can ensure that the drivers will use these services?
    - Centre must be linked to other service providers
    - Truck drivers should be able to get medications there
    - Promote how truck drivers can benefit from wellness centre
    - Have recreation activities to distract drivers from potentially risky behavior
    - Education: needs to promote the services of the Wellness Centre by telling them how they can benefit from the services provided
      - Marketing of services is one of the key aspects in making sure that drivers will use the centre
  8. Other discussion:
    - No statistic for percentage of truck drivers currently HIV positive
    - What the WBCG is doing is very new
    - Should have a statistic within the next year for the truck driving community
    - Studied two transport companies; had a 60-70% participation rate; less than 10% infection rate
    - Prevalence rate as per this study was surprisingly low

- Within 12 months they should be able to say what the prevalence rate is based on evidence rather than speculation

## APPENDIX CC: G4S INTERVIEW RESULTS

15 April 2009

G4S Office, Eros, Windhoek, Namibia

Interviewee: Leon Lombaard

Present: Brian Earley, Craig Jones, Anthony Laine, Bryan Rickard

1. What kinds of security services do you offer?
  - G4S provides services everywhere but Otjiwarongo, Otavi, Grootfontein, Luderitz, Keetmanshoop
  - Looking to open an office in Otjiwarongo
  - Offices in Windhoek, Oshakati, Ondangwa
  - Four security divisions:
    - Guarding division: embassies, airports, hotels, shops, everything
    - Assets in Transit Division: move cash, diamonds, precious metals
    - Alarm Systems/Armed Response Division
    - Vehicle Tracking: best equipment control systems, works in all of Africa
      - Looking to implement new system from London called Scope
2. How should a truck parking facility be secured?
  - G4S has considerable experience protecting long-distance trucks
  - Truck drivers have their own culture
    - They look after each other, stop at truck ports
    - Plan distances so they can stop somewhere safe
      - Many just sleep on the road
  - G4S has not heard about any truck hijacking in Namibia, but it is a problem in South Africa. Maybe up north in Angola as well
  - Need some sort of security in areas where there are no truckports
    - Some sort of tented camp where they can stop if far out on road
  - Drivers are often pressed for time and money
    - Will not necessarily stop unless they absolutely have to
  - Unsure if a fence around a large area is economically wise
    - Just a guard might work as an effective deterrent
  - Need communication services or cell phone coverage in cases of emergency
  - Usually go to service stations with good lighting and park there
3. How much would it cost to have G4S secure truck parking areas in Oshikango, Gobabis, and Walvis Bay?
  - These will be special costs, not standard costs
  - Insurance changes the costs further
  - Budgets for theft
  - Cannot really get into cost information

4. What kinds of equipment would need to be put in place in terms of fencing/walls, lighting, gate controls, and other equipment?
  - Fence may not be cost effective
  - A guard may be a sufficient deterrent
  - May be subcontracted guards from Namibian Protection Services
  - No G4S services in Gobabis yet
  - Communication station
  - Guards covered by Armed Response division
    - Guarantee 7 minute maximum transit time for Armed Response division anywhere in the town
  - Can sometimes subcontract guards, but they might not have armed response backup: what can they do?
5. About how much do you think all of that would cost?
  - Areas with cell phone coverage can just use cell phones: inexpensive
  - Areas without cell phone coverage need SAT phones: very expensive
  - Radios are limited unless you put up repeaters every 60 km
6. What is the most effective type of fence to secure an area? What should be at the top of the fence? Electric wires, barbed wire, spikes, etc.?
  - Fences will not keep criminals out
  - They are just another deterrent, as everything is
  - If there are no G4S guards in an area, maybe try to contract with a garage for security
7. Other discussion:
  - Putting readers along the main roads to read registrations on trucks to emulate toll roads
    - Can let transport company owners know where their vehicles are by tracking
  - Can install panic button in trucks to call for help
  - G4S has no helicopters in Namibia because they are expensive and rarely needed
  - Liability may be an issue. The truck stop contracts G4S's security services, but then would truck stops be subcontracting G4S's security to truck drivers? Where would the liability lay?
  - Location choice is important. There must be some type of backup in the form of ambulance, police, etc.

## APPENDIX DD: COOL IDEAS TRUCK STOP EMAIL RESULTS

15 April 2009

Email Conversation

Interviewee: Karl Erichsen

When did the Cool Ideas truck stop open?

*Cool Ideas Truckstop started about a year ago. We just had then a stop facility and restaurant. In August we installed a drive through truck wash and middle December we started with diesel.*

What operational costs are required for the Cool Ideas truck stop and what are they for?

a. How much energy do you use per month?

*Electricity per month is between R 7000 and R10000, where R3500 is for restaurant, lights, office and geysers. The rest is for the truck wash and depending on how many washes we do it will vary.*

b. How much water do you use per month?

*We have our own borehole that supply the truck stop with water. The truck wash uses 300000 liter of water, but it is recycled for 5000 washes*

What services does the Cool Ideas truck stop provide for trucks and passenger vehicles?

a. How much of each service is provided?

- *Stop facility available for 150 trucks and can expand to 250*
- *Bathroom with 8 enclosed partitions each with a shower and toilet.*
- *Restaurant and kiosk.*
- *Drive through truck wash can wash 150 trucks per day*
- *Diesel with 6 nozzles and 138000l diesel capacity.*
- *Laundry for washing.*

b. Which services are provided for 24 hours a day?

- *Stop open 24 hours*
- *Restaurant open 06h00 to 22h00*
- *Truck wash open 06h00 to 18h00 but can operate 24 hours*
- *Diesel open 24 hours*

What sort of health services are provided at the truck stop?

*There are no services available, but we are busy with Health and Safety together with RFA to implement a health clinic.*

Do you outsource certain services to other companies to control at the truck stop?

a. To what companies do you outsource these services?

*Yes. Tires, repairs like cylinders, electrical, truck tarpaulins and greasing of trucks*

*we outsource to companies in town that specialized in those businesses.*

What types of security do you have for parked trucks at the truck stop?

a. Do you have security fencing?

*Electric fencing*

b. Do you have security guards?

*2 in day time and 3 at night with a dog. We charge the client R70 per overnight, and for that we guarantee the stay without any losses*

Are the parking lots lit all the time?

*Yes*

What is the area in square meters of the parking lot?

*4 hectares*

How often do truck drivers use the restaurant you provide at the truck stop?

*60% that stop use the restaurant, the other make their own food.*

How large is the plot of land used by the truck stop?

*5 hectares*

## APPENDIX EE: WINDHOEK TRUCKPORT INTERVIEW RESULTS

24 April 2009

Windhoek Truckport, Windhoek

Interviewee: Adam Boshoff

Present: Brian Earley, Anthony Laine, Gilbert Boois

1. How many trucks utilize the truck stop per day?
  - About 30 trucks per day on an average day
  - A busy day might have 60 trucks per day
2. What types of security do you have? Lighting, fencing, security guards, etc?
  - Floodlights
  - Two security guards
  - Armed guard at night
  - Patrols between trucks
3. What services do you provide at your truck stop?
  - Fuel pumps
  - Shower
  - Washing basins for clothes
  - Food shop
  - Secure parking
4. How much of each service is provided?
  - Four diesel pumps
  - Two male showers
  - One female shower
  - Laundry wash basins
  - Parking lot can hold 40 trucks concurrently
5. Which services are provided for 24 hours a day?
  - Parking lot is open 24 hours
  - Tuck Shop open until 10pm, reopens at 6am
6. Are the parking lots lit all the time?
  - Parking lots are lit at night
7. What is the area in square meters of the parking lot?
  - See below for size of entire premise
8. How large is the plot of land used by the truck stop?
  - The size of the total premise is 83,000 m<sup>2</sup>
9. What is your experience with truck drivers asking for services that you don't provide?
  - Have a system to allow truck drivers to write down their requests
  - Then we look into their requests to see what we can do
10. What sort of health services are provided at the truck stop?
  - No health services provided
11. Do you outsource certain services to other companies to control at the truck stop?

- Security services is outsourced to Marine Security
12. What types of problems have you seen with theft and vandalism of trucks?
- Some theft/vandalism problems in the past
  - Usually between truck drivers themselves
13. What do you see as current problems along the corridors?
- Security is the biggest problem along the corridor
  - Truck drivers need secure parking
14. Other discussion:
- N\$28 million for expansion and renovation of the Windhoek Truckport

## APPENDIX FF: SADC CARGO SHIPPED IN 2008

### Port Of Walvis Bay

Sacd cargo shipped from January 2008 - December 2008

Commodity	Tonnage	Containers	
		6m	12m
CEMENT	24,161.00		
GENERAL	404.7		
MACHINERY	651.2		
SALT BAGGED	2827		
SHIPS SPARES	16.5		
SHIPS STORES	1		
VEHICLES ON OWN WHEELS	90.3		
<b>Total Breakbulk Cargo Handled To Angola</b>	<b>28,151.70</b>		
COLD DRINKS	286	13	0
FROZEN FISH	44	0	1
GENERAL	814	23	7
HOUSEHOLD & PERSONAL EFFECT	22	1	0
SALT BAGGED	13916	625	0
SHIPS SPARES	176	0	4
SPARE PARTS	66	3	0
TYRES	132	0	3
<b>Total Containerized Cargo Handled To Angola</b>	<b>15456</b>	<b>665</b>	<b>15</b>
<b>Total Cargo Handled To Angola</b>	<b>43607.7</b>	<b>665</b>	<b>15</b>
GENERAL	44	0	1
SKINS,HIDES & PRODUCTS THER	22	1	0
<b>Total Containerized Cargo Handled To Botswana</b>	<b>66</b>	<b>1</b>	<b>1</b>
<b>Total Cargo Handled To Botswana</b>	<b>66</b>	<b>1</b>	<b>1</b>
CEMENT	282		
EMPTY BAGS	7		
SALT BAGGED	60,507.40		
<b>Total Breakbulk Cargo Handled To Congo (DRC)</b>	<b>60,796.40</b>		
CLOTHING	44	0	1
HOUSEHOLD & PERSONAL EFFECT	66	1	1
SALT BAGGED	176	8	0
SPARE PARTS	22	1	0
VEHICLES ON OWN WHEELS	66	1	1
<b>Total Containerized Cargo Handled To Congo (DRC)</b>	<b>374</b>	<b>11</b>	<b>3</b>
<b>Total Cargo Handled To Congo (DRC)</b>	<b>61170.4</b>	<b>11</b>	<b>3</b>
GENERAL	2.4		
SALT BAGGED	13,360.00		
<b>Total Breakbulk Cargo Handled To Congo (Brazaville)</b>	<b>13,362.40</b>		
BEER	44	2	0
SALT BAGGED	66	3	0
URANIUM ORE CONSENTRATE	154	7	0
<b>Total Containerized Cargo Handled To Congo (Brazaville)</b>	<b>264</b>	<b>12</b>	<b>0</b>
<b>Total Cargo Handled To Congo (Brazaville)</b>	<b>13626.4</b>	<b>12</b>	<b>0</b>
BEER	154	7	0
HOUSEHOLD & PERSONAL EFFECT	154	3	2
SALT BAGGED	374	17	0
<b>Total Containerized Cargo Handled To Kenya</b>	<b>682</b>	<b>27</b>	<b>2</b>

<b>Total Cargo Handled To Kenya</b>	<b>682</b>	<b>27</b>	<b>2</b>
BEER	660	30	0
FROZEN FISH	880	0	20
GENERAL	44	0	1
<b>Total Containerized Cargo Handled To Mozambique</b>	<b>1584</b>	<b>30</b>	<b>21</b>
<b>Total Cargo Handled To Mozambique</b>	<b>1584</b>	<b>30</b>	<b>21</b>
EMPTY TANK/CONT	124	123	1
GENERAL	132	0	3
<b>Total Containerized Cargo Handled To Luderitz From Walvis Bay</b>	<b>256</b>	<b>123</b>	<b>4</b>
<b>Total Cargo Handled To Luderitz From Walvis Bay</b>	<b>256</b>	<b>123</b>	<b>4</b>
CHEMICALS	1	0	0
MACHINERY	746.3	0	0
SHIPS SPARES	41	0	0
VEHICLES ON OWN WHEELS	100.9	0	0
<b>Total Breakbulk Cargo Handled To South Africa</b>	<b>889.2</b>		
SALT BULK	262,500.50	0	0
<b>Total Bulk Cargo Handled To South Africa</b>	<b>262,500.50</b>		
BEER	44	2	0
CANNED FISH	1452	66	0
EMPTY BAGS	176	8	0
EMPTY TANK/CONT	5126	3650	1476
FISHMEAL	88	4	0
FROZEN FISH	418	5	7
GENERAL	704	12	11
MACHINERY	22	1	0
SALT BAGGED	31702	1441	0
SUGAR	418	19	0
VEHICLES ON OWN WHEELS	88	2	1
<b>Total Containerized Cargo Handled To South Africa</b>	<b>40238</b>	<b>5210</b>	<b>1495</b>
<b>Total Cargo Handled To South Africa</b>	<b>303627.7</b>	<b>5208</b>	<b>1495</b>

**Total Cargo Handled** 424620.2

<b>South Africa</b>	<b>303627.7</b>	<b>5208</b>	<b>1495</b>
<b>DRC</b>	<b>61170.4</b>	<b>11</b>	<b>3</b>
<b>Angola</b>	<b>43607.7</b>	<b>665</b>	<b>15</b>
<b>Congo (Brazaville)</b>	<b>13626.4</b>	<b>12</b>	<b>0</b>
<b>Mozambique</b>	<b>1584</b>	<b>30</b>	<b>21</b>
<b>Kenya</b>	<b>682</b>	<b>27</b>	<b>2</b>
<b>Luderitz</b>	<b>256</b>	<b>123</b>	<b>4</b>
<b>Botswana</b>	<b>66</b>	<b>1</b>	<b>1</b>

## APPENDIX GG: SADC CARGO LANDED IN 2008

### Port Of Walvis Bay

Sacd cargo landed from January 2008 - December 2008

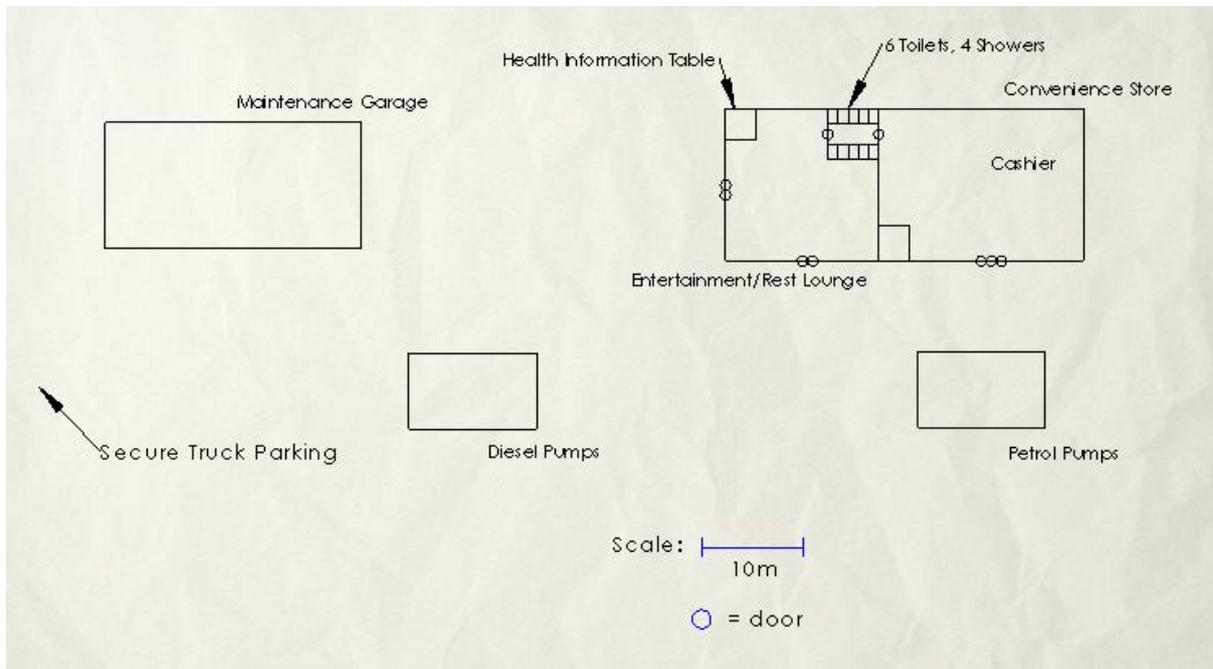
Commodity	Tonnage	Containers	
		6m	12m
MACHINERY	4		
SHIPS SPARES	60		
VEHICLES ON OWN WHEELS	20.9		
<b>Total Breakulk Cargo Handled From Angola</b>	<b>84.9</b>		
EMPTY TANK/CONT	1186	224	962
HOUSEHOLD & PERSONAL EFFECT	44	2	0
SHIPS SPARES	22	1	0
<b>Total Containerized Cargo Handled From Angola</b>	<b>1252</b>	<b>227</b>	<b>962</b>
<b>Total Cargo Handled From Angola</b>	<b>1336.9</b>	<b>227</b>	<b>962</b>
FLAT CARTONS	22	1	0
HOUSEHOLD & PERSONAL EFFECT	22	1	0
<b>Total Containerized Cargo Handled From Congo (DRC)</b>	<b>44</b>	<b>2</b>	<b>0</b>
<b>Total Cargo Handled From Congo (DRC)</b>	<b>44</b>	<b>2</b>	<b>0</b>
SODIUM CARBONATE	704	32	0
<b>Total Containerized Cargo Handled From Kenya</b>	<b>704</b>	<b>32</b>	<b>0</b>
<b>Total Cargo Handled From Kenya</b>	<b>704</b>	<b>32</b>	<b>0</b>
HOUSEHOLD & PERSONAL EFFECT	22	1	0
<b>Total Containerized Cargo Handled From Mozambique</b>	<b>22</b>	<b>1</b>	<b>0</b>
<b>Total Cargo Handled From Mozambique</b>	<b>22</b>	<b>1</b>	<b>0</b>
VEHICLES ON OWN WHEELS	13.2		
<b>Total Breakulk Cargo Handled From Luderitz To Walvis Bay</b>	<b>13.2</b>		
FROZEN FISH	44	0	1
GENERAL	66	3	0
<b>Total Containerized Cargo Handled From Luderitz To Walvis Bay</b>	<b>110</b>	<b>3</b>	<b>1</b>
<b>Total Cargo Handled From Luderitz To Walvis Bay</b>	<b>123.2</b>	<b>3</b>	<b>1</b>
MACHINERY	66.1		
PAINT	4		
PIPES	72		
SHIPS SPARES	9		
SHIPS STORES	2		
SPARE PARTS	5.7		
SUGAR	18,483.10		
<b>Total Breakulk Cargo Handled From South Africa</b>	<b>18,641.90</b>		
COAL	183,434.60		
DIESEL,DISTILATE FUEL,FUEL-	9,503.00		
PETROL,MOGAS	532,711.09		
<b>Total Bulk Cargo Handled From South Africa</b>	<b>725,648.69</b>		
BEER	704	32	0
BUILDING MATERIALS	924	42	0
CANNED FISH	22	1	0
CHEMICALS	8824	401	0
COLD DRINKS	22	1	0
DANGEROUS CARGO	374	17	0
EMPTY TANK/CONT	423	261	162

FISHMEAL	22	1	0
FROZEN FISH	418	1	9
GENERAL	1738	67	6
HOUSEHOLD & PERSONAL EFFECT	66	1	1
MACHINERY	44	0	1
MOLASSES	2024	92	0
OTHER BEVERAGES	176	8	0
OTHER MINERALS	22	1	0
OTHER PREPARED FOODSTUFFS	22	1	0
PLASTIC	176	0	4
SALT BAGGED	44	2	0
SALT PRODUCTS	22	1	0
SHIPS SPARES	44	2	0
SKINS,HIDES & PRODUCTS THER	22	1	0
SODA ASH	1694	77	0
SODIUM CARBONATE	2530	115	0
STEEL	198	3	6
SUGAR	40380	1866	0
TILES	770	34	0
VEHICLES ON OWN WHEELS	220	6	2
WHISKY,BRANDY	22	1	0
WINE	154	7	0
WOODEN PRODUCTS	66	3	0
<b>Total Containerized Cargo Handled From South Africa</b>	<b>62167</b>	<b>3045</b>	<b>191</b>
<b>Total Cargo Handled From South Africa</b>	<b>806457.59</b>	<b>3045</b>	<b>191</b>

**Total Cargo Handled** 808687.69

<b>South Africa</b>	<b>806457.59</b>
<b>Angola</b>	<b>1336.9</b>
<b>Kenya</b>	<b>704</b>
<b>Luderitz</b>	<b>123.2</b>
<b>DRC</b>	<b>44</b>
<b>Mozambique</b>	<b>22</b>

## APPENDIX HH: SECONDARY TRUCK STOP LAYOUT DRAWINGS



## APPENDIX II: FULL-SERVICE TRUCK STOP LAYOUT DRAWINGS

