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THE LOGISTICS OF STEEL DISTRIBUTION IN SOUTH AFRICA WITH SPECIFIC REFERENCE TO A LARGE TRANSPORT OPERATOR

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A project report submitted to the Faculty of Engineering, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Engineering.

Johannesburg 1989

DECLARATION

I declare that this project report is my own, unaided work. It is being submitted for the Degree of Master of Science in Engineering in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

(Signature of candidate)

28 th day of August 1989

ABSTRACT

This project deals with the viability of establishing a staging operation in the Alberton area which will enable Cargo Carriers Limited to improve its service in the distribution of Iscor's steel.

This report discusses the logistics of the staging operation and the cost implication : A forecast is made to compare the profitability of the new operation with the existing method distributing steel.

Conclusions reached are:

- the establishment of a staging operation will provide an improved service to Iscor at the cost of being 7 percent less profitable (in terms of return on turnover).
- the cost of establishing a new depot in Alrode for the staging operation will be in the region of R5 000 000.
- by shunting and staging loads overnight in Alberton a capital saving of 27 vehicles will be achieved.

The establishment of a staging operation will also provide Cargo Carriers Limited with the following benefits:

- improved productivity of fleet.
- more flexibility of service.
- enough room for any future expansion of depot.
- the possibility of obtaining new business from the large industrial companies which are located near the new depot.

Because of the operational benefits and improved customer service it is recommended that Cargo Carriers Limited proceeds with the establishment of such an operation.

ACKNOWLEDGEMENTS

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NOMENCLATURE

articulated vehicle	a combination of motor vehicles consisting of a truck-tractor and a semi trailer
CISCO	Cape Town Iron and Steel Works (Pty) Ltd
cpk	cents per kilometre
gvm	gross vehicle mass, the maximum manufacturers design of the vehicle taking into account frame strength and axle rating
HSV	Highveld Steel and Vanadium Corporation
ISCOR	South African Iron and Steel Industrial Corporation Limited
Public haulier	a transport operator who possesses a motor transport certificate and whose main activity is transport for reward
Private carrier	a business or institution trading for profit but who transports his own goods not for reward
Rigid	a vehicle designed as a load carrier with a single chassis mounted on two or more axles
Semi-trailer	a trailer with no front axle which is drawn by a truck-tractor in such a manner that 15 percent of its load is borne by the truck-tractor
Tandem	a semi-trailer with 2 axles
TRIDEM	a semi-trailer with 3 axles
Truck-tractor	a motor vehicle designed for drawing other vehicles and can only carry a load with a semi-trailer
USCO	The Union Steel Corporation of South Africa Limited

CHAPTER 1

1.0 INTRODUCTION AND OBJECTIVE

1.1 Objective

The objective of this project was to analyse the flow of carbon steel produced at 3 production centres belonging to The South African Iron and Steel Corporation (ISCOR) to its customers, who are situated primarily in the PWV area, with view of establishing a staging depot in this area in order to :

- Improve on the service that Cargo Carriers renders to Iscor
- Increase the profitability of the steel distribution operation of Cargo Carriers.

The distribution of this steel is presently undertaken on a contractual basis by Cargo Carriers Limited - the largest public carrier in South Africa. This contract was awarded to Cargo Carriers Limited in March 1987 and will expire in February 1992.

At present Cargo Carriers distributes the steel for ISCOR using 3 depots situated at each of the production centres. Although the steel is collected from ISCOR and delivered directly to its customers, this has proved to be an inefficient method of distribution mainly due to congestion (queuing problems) at both ISCOR and its' customers. Thus Cargo Carriers is considering establishing a shunting (staging) depot in the PWV area where loads will be staged overnight with the aim of reducing the congestion both at ISCOR and its' customers and in so doing provide a better service to ISCOR.

if the establishment of this shunting depot is not undertaken, Cargo Carriers stands a good chance of losing this steel contract when it expires in February 1992. At present this single contract contributes as much as 25 percent to the company's annual revenue, thus losing this contract will have a devastating effect on the company's bottom line (profit), and will most certainly result in the company being shifted from its leading position in the market.

The layout of this report is to allow the reader, firstly to get a macro view of the subject dealt with herein and then to proceed slowly to a micro view of the actual problem, its analysis and its solution and then finally to "tie up" the report with conclusions and recommendations.

In chapter 2 an overview of the steel industry in South Africa will be presented with specific reference to ISCOR and the problem it has with the distribution of steel in this country, particularly in the PWV area. The chapter will commence with some theory on distribution.

The problem as seen from Cargo Carriers' point of view will be discussed in chapter 3 along with information relevant to the transport industry such as government regulation which, to a large extent, controls the manner in which a road transport carrier such as Cargo Carriers may operate.

Chapter 3 will also attempt to integrate the problem as seen from Iscor's and Cargo Carriers' point of view and suggest some possible solutions. As can be seen the investigation is slowly shifting from a macro level to a micro analysis.

The manner in which the problem was investigated is described in chapter 4. Chapter 5 focuses on calculating the fleet and load requirements for the new distribution operation and discusses the mechanics of it.

Chapter 6 takes a financial look at establishing the staging depot. In this chapter the profit and loss statements for the new distribution operation is constructed and discussed.

In chapter 7 the new depot *will be discussed in terms of its layout* facilities ,nd cost.

Chapter 8 will provide a summary of the conclusion of this project and present some recommendations for future work.

CHAPTER 2

2. BACKGROUND INFORMATION

2.1 Introduction

Virtually every business operation has in some way or another some involvement with distribution (1), however it is astonishing *to note how many organisations* are not intimately aware of all the facets which make up the distribution process and consequently are unable to identify the road costs of their distribution (1).

2.2 What is Distribution?

Distribution has become a common buzzword. According to Marcus (1), "if you are anybody in the transport business it is fashionable to be in distribution", however there is a lot more to distribution than simply collecting goods at point A and delivering them to point B. The following definition of distribution will clarify what distribution is and what the distribution process should include. It is also necessary to distinguish between distribution and physical distributors.

Magee (2) refers to distribution as the combination of activities and institutions associated with the advertising, sale and physical transfer of products or services. Physical distributors are defined by Magee (2) as the portion of a logistic system concerned with the outward movement of products from the seller to the customer or consumer. This is the "physical transfer of products" he refers to in his definition of distribution. It is also interesting to note the "seller" and "consumer" in the above definition does not only refer to the "seller" and "consumer" of the finished product but may also include the "seller" and "consumer" of raw materials.

2.2 What is Distribution (Continued)

It is thus clear that physical distribution includes both inwards flow of raw materials as well as the outward flow of finished products.

Taft (3) defines physical distribution as the management of movement, inventory control, protection and storage of raw material and process of finished goods to and from the production line. This would embrace materials handling, transportation, industrial packaging, warehousing and inventory control.

This definition of physical distribution mentions some of the facets of the distribution process such as materials handling and warehousing which today form an integral part of the distribution process. These elements of the distribution function are now needed by customers who today require a package of services from transport operators rather than just having their goods transported. Transport operators such as Cargo Carriers have taken cognisance of this and have now adopted a business philosophy which hinges around the needs of its customers who require more than just transportation (section 3.5).

Lambert and Stock (4) refer to distribution as the movement of the flow of goods from point of origin to point of consumption. They define physical distribution as that term which integrates or co-ordinates two or more activities with the aim of planning, implementing and controlling the effective flow of raw materials, work-in process and finished goods from the point of origin to the point of consumption. Furthermore, Lambert and Stock (4) state that the activities of physical distribution management embrace customer service, demand analysis, communication, stock control, materials handling, order processing, parts and service support and the decision for the location of production and warehousing facilities as well as obtaining goods and services, packaging, handling of returned goods, transport and waste material handling.

2.2 What is Distribution (Continued)

Lambert and Stock (4) state clearly what the distribution process should include in their lengthy definition of distribution and also illustrate what is entailed in physical distribution management. It is clear from the above definition that a professional and well trained complement of staff is required to manage physical distribution effectively.

Vollman, Berry and Whybark (5) define physical distribution simply as the movement and storage of products. The former requiring some method of transportation. This statement is the most succinct definition of physical distribution so far but it gives no indication of what is involved in the "movement" and "storage" of goods. It does not, however, restrict itself to the movement and storage of finished goods only, implicit in this definition is both the inward flow of raw material and the outward flow of finished goods and could also include the movement and storage of by-products and waste products.

According to Aylott (6) distribution is the inter-relationship of all the factors which affect the flow of both information and goods necessary to fill orders. This flow begins when a customer decides to place an order and ends when the customer receives the order.

Here the idea that distribution is more than just transportation of goods is again reinforced. Aylott (6) implies that distribution could include every activity necessary to fulfill a customer's need once the customer has placed an order. This would include most of the activities described by Lambert and Stock (4). Perhaps the most common definition of physical distribution is that of the National Council of Physical Distribution Management in the United States of America (7) who define it as "... the broad range of activities concerned with the efficient movement of the finished products from the end of the production line to the consumers".

2.2 What is Distribution? (Continued)

They add the following qualification, "and in some cases include the movement of raw material from the source of supply to the beginning of the production line".

The National Council of Physical Distribution Management in the United States of America (7) make use of the words "efficient movement" in their definition of distribution. Implicit in this is the fact that distribution could be a costly process if not conducted in an efficient manner - efficiency should become synonymous with physical distribution otherwise costs would escalate universally and would eventually retard economic growth.

2.3 The Cost of Distribution

Cooke (8) acknowledges that physical distribution is generally accepted as the third largest group of company average manufacturing costs after raw materials and salaries and wages. Kloss (9) calculated that the aggregate costs of physical distribution vary from as low as 10 percent in the machine and tool industries up to an incredible 27 percent in the merchandising companies.

For manufacturing companies the cost of distribution activities average at almost 14 percent of the sales Rand. There is a likelihood that this figure is underestimated (10) because most of the activities listed emphasise the physical distribution component only.

Table 2.1 illustrates that the average cost of distribution as a percentage of the sales Rand for merchandising, consumer goods and industrial goods, are respectively 25,6 percent, 24,2 percent and 28,4 percent and these costs are continuously increasing.

Table 2.1 The Cost of Distribution as a percentage of Sales

Industry	Outbound Transportation	Inventory Carrying	Warehousing	Administration	Receiving and Shipping	Packaging	Order Processing	Total
All manufacturing companies	6,2%	3,6%	3,6%	0,5%	0,8%	0,7%	0,5%	13,5%
Chemicals and Plastics	6,3	1,6	3,3	0,3	0,7	1,4	0,6	14,1
Food manufacturing	8,1	0,3	3,5	0,4	0,9	-	0,2	13,4
Pharmaceutical	1,4	-	1,2	0,7	0,5	0,1	0,5	4,4
Electronics	3,2	2,5	3,2	1,2	0,9	1,1	1,2	13,3
Paper	5,8	0,1	4,6	0,2	0,3	-	0,2	11,2
Machinery and tools	4,5	1,0	2,0	0,5	0,5	1,0	0,5	10,0
All other	6,8	1,0	2,9	1,2	1,4	0,4	0,4	14,1
All merchandising companies	7,4%	10,3%	4,2%	1,2%	0,6%	1,2%	0,7%	25,6%
Consumer goods	8,1	8,5	4,0	1,3	0,9	0,9	0,5	24,2
Industrial goods	5,9	13,7	2,9	0,7	0,2	2,0	1,0	26,4

Source : B.L. LaLonde and P.H. Zinszer, Customer Service : Meaning and Measurement (Chicago, National Council of Physical Distribution Management, 1976).

2.3 The Cost of Distribution (Continued)

According to Marcus (1) in his paper 'Distribution in South Africa - Quo Vadis' distribution costs escalate at a higher tempo than perhaps any of the other sectors in the manufacturing environment. He attributes this to :

* the rising costs of warehousing
* the cost of holding inventory
* intensity of competition
* the labour intensive nature of distribution and associated union activities
* the expectation of the client who wants an improved service, he wants better and more frequent delivery and is showing an interest in holding less and less stock in order to adapt to the JUST-IN-TIME philosophy of having zero inventory.

Marcus (1) believes that the appointment of high calibre management to handle physical distribution as well as ensuring better utilisation of the company's assets through the use of modern techniques (such as industrial engineering) will continue to reduce the high cost of distribution.

2.4 Logistics and Distribution

There appears to be some confusion between logistics and physical distribution, logistics and "pure" distribution and physical distribution and distribution per se. The latter has already been discussed (section 2.2). Some attempt will be made to distinguish between the former as briefly as possible.

2.4 Logistics and Distribution (Continued)

Logistics, says Magee (2), is the art of managing the flow of materials and products from source to user. The logistics system includes the total flow of materials, from the acquisition of raw materials to the delivery of finished products to the ultimate users, although traditionally an individual firm has typically directly controlled only a portion of the total physical distribution system for its product.

Coyle and Bardi (10) define logistics as the planning, controlling and organisation of all the movement and storage activities that facilitate product flow from the point of raw material acquisition to the point of final consumption.

Bartlett (11) uses the following description of logistics.

> 'This field deals with the development of distribution systems necessary to support the raw material and finished product flows of the business firm'.

The difference between physical distribution and logistics according to Magee (20) is that physical distribution refers to the portion of a logistic system concerned with the outward movement of products from the seller to the customer or consumer. This differs with the definition of distribution per se which is the combination of activities and institutions associated with the advertising, sale and physical transfer of products or services - it is concerned with broader matters than logistics alone.

It is clear that the above definitions that logistics and physical distribution are both concerned with the flow or movement and storage of products. Thus there is no difference between these two, however they both differ with distribution which is concerned with more than physical distribution and logistics (section 2.2)

2.4 Logistics and Distribution (Continued)

As mentioned in chapter 1 the rest of this chapter will deal with an overview of the steel industry in South Africa, with particular reference to ISCOR and the problem ISCOR has with its local distributions operations.

2.5 An Overview of the Carbon Steel Market in South Africa

The largest primary producers of carbon steel in South Africa are

* The South African Iron and Steel Industrial Corporation Limited (ISCOR) **
* The Highveld Steel and Vanadium Corporation Limited (HSV)
* Scaw Metals Limited
* The Union Steel Corporation of South Africa Limited
* McWillow (Proprietary) Limited
* Dav Steel (Proprietary) Limited
* George Stott (Proprietary) Limited

The total steel production for the 1987 calendar year for the domestic market was estimated at 4,255 million tons with ISCOR contributing a massive 3,064 million tones (72 per cent) to the market. ISCOR was followed by HVS with 468 000 tons, Scaw Metals with 383 000 tons and Usco with 213 000 tons.(12)

** The other large steel producer, The Cape Town Iron and Steel Works (Proprietary) Limited is incorporated in ISCOR.

2.5 An Overview of the Carbon Steel Market in South Africa (Continued)

The remaining primary steel producers contributed approximately 2 percent to the national domestic market* (figure 2.1).

It is estimated that approximately 50 percent of Iscor's production is exported and of the remaining steel for the local market approximately 70 percent (2,145 million tons)** is transported by road by a contractor such as Cargo Carriers and its sub-contractors.

2.6 The ISCOR Product Range

ISCOR produces a diverse range of products at its production centres in Vanderbijlpark, Newcastle, Pretoria, Dunswart and Cape Town. These products include coils, plates, steel rods, beams, channel iron, forgings, welding wire, high tensile bolt steel and other special steels for projects such as the Mossel Bay Gas project. ISCOR is continuously improving existing products and developing alternative steel products. Table 2.2 illustrates the steel products which Cargo Carriers transports on behalf of ISCOR from each of the production centres.

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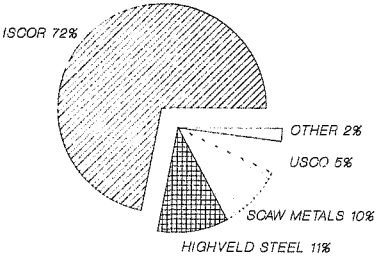
* Due to the strategic importance of the steel industry in South Africa it is very difficult to get accurate data on steel production and sales. The figures above were arrived at by using published data, where possible, or were based on estimates given by senior persons in industry.

** These figures are based on operations figures which are compiled by Cargo Carriers monthly.

DOMESTIC CARBON STEEL MARKET 198.



SHARE OF THE MARKET

SOURCE : SEE REF. 12

2.6 The ISCOR Product Range (Continued)

Table 2.2 ISCOR products transported by Cargo Carriers

	Production Centres		
	Vanderbijlpark works	Pretoria works	ISCOR warehouse Alrode
Plates	x	x	x
Coils	x	x	x
Sheets	x	x	x
Wire coils		x	x
Channel iron			x
Beams		x	
Rail tracks		x	
Fencing poles		x	
Forgings		x	
Rods		x	x
Reinforcing rods		x	

All products can be manufactured in a variety of steels strength and can be hot or cold rolled. In order to fully understand and appreciate the problem ISCOR is faced with it is necessary to understand how Iscor's present steel distribution is undertaken. Once this has been achieved the problem can then be fully defined.

2.7 The existing steel distribution operation at ISCOR

At present ISCOR has five production centres situated in various parts of the country. The largest production centre is the Vanderbijlpark Works which, during the 1986/87 financial year had sales of 3 476 000 tons of finished steel products, this was followed by the Newcastle Works and the Pretoria Works with 1 170 000 tons and 530 000 tons respectively (12) (figure 2.2).

As Cargo Carriers does not distribute steel for ISCOR from the Dunswart and CISCO Works they will not be dealt with in this report. The rest of the report will focus on the Vanderbijlpark and the Pretoria Works as well as the Alrode Warehouse, situated in Alberton which stores steel produced at Newcastle.

Situated next to each of the production centres are Cargo Carrier depots. These are responsible for the steel distribution from that particular production centre. The daily distribution operation of each of these depots is as follows.

2.7.1 The Daily Operation of a Steel Depot

At the beginning of each day the contracts controller (the person responsible for execution of the deliveries) receives a computer printout from ISCOR. This document contains information pertaining to that days deliveries. It will contain the number of loads that have to be delivered that day, the mass of each load, where the load is to be found (i.e. at which loading bay* the load

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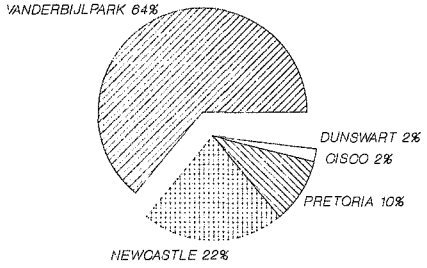
* Each of iscor's production centres have numerous loading bays where the different finished products are stored. The Vanderbijlpark Works, for example has 13 loading bays where the awaiting finished product can be loaded onto the vehicles. (see appendix A).

SALES OF ISCOR STEEL PRODUCTS 1986/87



TOTAL SALES R5 428 400

SOURCE : SEE PET. 12

2.7.1 The Daily Operation of a Steel Depot (Continued)

must be collected) and to where the load must be taken i.e. the customer's name and physical address. From this computer document the contracts controller prepares a dispatch report which indicates the loads available for delivery, the loads which are not deliverable, the load which can be dispatched that day and the daily target for each loading bay at ISCOR. The contracts controller can now advise each vehicle which arrives at his office which load to collect from where and to whom to deliver it to.

When an empty vehicle from the depot arrives at the weighbridge (which is situated opposite the contract controller's office) the vehicle is weighed. The 'lorrymate' (who always accompanies the driver) then collects a document (a weighbridge slip) from the contracts controller which contains the customers name, the loading bay number (Appendix A) and the mass of the load. The vehicle is then driven to the correct loading bay where the 'lorrymate' hands the weighbridge slip to the ISCOR 'loader' who in turn instructs the crane operator which load to place onto the vehicle. Once the vehicle is loaded it returns to the weighbridge where it is weighed once again to ensure that the payload corresponds to the weight on the weighbridge slip. If there is a discrepancy of up to 250kg either way the vehicle has to return to the loading bay in order to correct the load.

The ISCOR loader receives 3 copies of a delivery note from ISCOR, he retains one and gives the driver 2 copies. Both copies accompany the driver to the customer when delivering the steel. The customer signs both and retains one for his records. Throughout the day the driver collects all his copies of the deliveries for that day and attaches them to his logsheet. These documents are handed to the depot clerk in the evening.

The vehicles make up to 3 trips a day from ISCOR to customers and at the end of the day (shift) the vehicles are parked in the depot until the following morning.

2.7.1 The Daily Operation of a Steel Depot (Continued)

The operation within all ISCOR's factories or warehouses is very similar, the only difference being the opening and closing times of the loading bays. The warehouse in Alrode for example only despatches steel until 15h30 whereas in the depot in Pretoria the trailers can be loaded at any time during the night but the last loaded trailer cannot leave the weighbridge later than 22h00 (when the weighbridge closes). However, empty trailers may be left in the loading bay for loading overnight ready for collection early in the morning (the weighbridge re-opens at 05h00). The operation at ISCOR's Vanderbijlpark works run continuously (24hrs per day), but deliveries to the customers are only undertaken during the day, from approximately 05h00 to 16h00.

A few customers are prepared to keep their goods receiving bays open until late in the night in order to receive deliveries, however the majority close at approximately 16h00.

As previously mentioned, the ISCOR warehouse in Alrode closes its despatching bays at 15h30. Instead of the vehicles of the Alrode depot standing idle after 15h30 they are sent to ISCOR's Vanderbijlpark works to aid the Vanderbijlpark depot with its distribution which sometimes runs late into the night. On completion of this the vehicles return to the Alrode depot ready for distribution from the ISCOR warehouse which opens at 05h00.

The Pretoria steel depot has two vehicles dedicated to shunting trailers, the rest of the fleet is used for distribution. The task of the shunting vehicles is to move empty trailers to the steel depot. These trailers are unlatched and then each coupled to a vehicle which delivers the loads to the customers.

The above discussion gives a brief overview of how the steel produced by ISCOR is presently distributed. The problem with this distribution operation is described below.

2.7.2 Shortcomings of the Present Distribution Operation

ISCOR's steel production is a continuous process running 24 hours a day throughout the year. The majority of ISCOR's customers - the secondary manufacturers, can only receive delivery from ISCOR during their working hours which is usually an 8 to 10 hour day, 5 days a week. The result is that a 'gap' develops between ISCOR's production capacity and ISCOR's customers receiving capacity (ISCOR produces far in excess of what customers can receive on a daily basis). In order to bridge this gap ISCOR has to allow the finished product to be stored in its loading bays until it can be delivered. The result is a build up of finished goods inventory in ISCOR's loading bays which gives rise to extreme congestion, as the vehicles have to drive into the loading bays in order to be loaded. The build up of finished goods is especially severe over the weekends and public holidays where ISCOR still produces but no deliveries are made by Cargo Carriers.

ISCOR is thus faced with the following problems :

(i) It has a large and increasing finished goods inventory which is expensive to hold, especially since value has already been added to the product. If storage of a product is necessary it should be done in the raw material stage (when no value has been added to it) once value has been added to a product it should be shipped out of the production environment as quickly as possible in order to recoup the money spent on it.

(ii) Iscor's service to its customers is not what it should be. Customers* are not receiving their orders on due dates due to the backlog which has to be made up.

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* This especially true for customers who have a low priority on ISCOR's dispatch schedule.

2.7.2 Shortcomings of the Present Distribution Operation (Continued)

(iii) The build up of finished goods inventory has resulted in extreme congestion. Vehicles find themselves queuing for unnecessarily long periods outside certain loading bays. This has resulted in the inefficient use of the vehicles which in turn has lowered their productivity considerably. Although this is more of a problem to Cargo Carriers it is nevertheless contributing to ISCOR's declining service level.

Ideally ISCOR would like Cargo Carriers to load the finished product as it rolls of the production line and deliver it immediately to ISCOR's customers, thus having a zero finished goods inventory, and at the same time providing its customers with excellent service. The problem of congestion in the loading bays would also be eliminated. However this is not possible due to the dissimilar operating hours of ISCOR and its customers.

The possible solution(s) to this problem will be discussed in the next chapter after the problem has been examined from Cargo Carriers' point of view.

CHAPTER 3

3. Transport and Cargo Carriers Limited

This chapter introduces the problem(s) ISCOR is faced with from Cargo Carriers' point of view. Before this is done, some background will be given regarding road transportation in general in South Africa and then focusing on the operation which Cargo Carriers runs.

3.1 Road Transportation in South Africa

Regulated road transportation in South Africa is a 2 billion Rand industry carting 8 percent of the country's total goods by volume around the national network (13). It is important to note that road transportation touches upon every aspect of daily economic life and that a high-cost road transportation infrastructure escalates costs universally, simultaneously fuelling inflation and retarding economic growth.

3.1.1 Transport and the Economy

The great French historian, Fernand Braudel (14) stated that 'Transport is the natural conclusion of the production process. If it accelerates all goes well ...'. Braudel reinforces the ideas that transport is synonymous with 'economic activity and that a smooth flow of goods is prerequisite to a country's prosperity.

Last year transportation accounted for approximately 7 percent of South Africa's Gross Domestic Product (figure 3.1) with this sector* providing employment for approximately 6,8 percent of the

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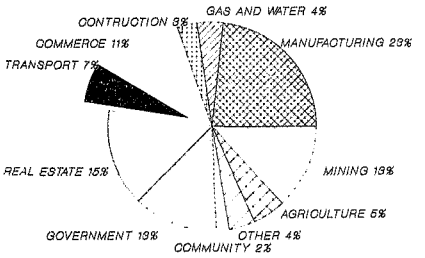
* The transport sector of Gross Domestic Product consists of all commercial transportation of goods and passengers by all modes of transport.

CONTRIBUTION OF TRANSPORT TO THE GROSS DOMESTIC PRODUCT FOR 1987



TOTAL GDP R155 000 000

SOURCE : CENTRAL STATISTICS SERVICE

3.1.1 Transport and the Economy (Continued)

country's total work force (15). The performance of the transport sector is indicative of the growth rate of the economy as a whole and the growth rate of this sector compares favourably with the rates recorded for the industrial, construction and trade sectors (for example). On only two occasions since 1970 has transport accounted for less than 7 percent of the GDP (1983 - 6,5 percent and 1985 - 6,6 percent) and in 1976 this sector contributed as much as 8,6 percent.

3.2 The Present Scope of Road Transportation in South Africa

Road transportation in South Africa is heavily involved with the movement of goods as well as people, particularly in the rural areas that are not attainable by rail. As a result of serving these remote areas by road the South African Transport Services has become the largest road transportation operator in the country and has been protected for many years by government edict.

South Africa road transportation has been one of the most over-regulated sectors of the economy due to the South African Transport Service's (SATS) monopolistic control of rail services, coupled with its massive subsidised involvement in road transportation (13). These activities have been protected by government legislation, essentially through the issue of permits, on the types of freight which is permitted to be moved and the routes that may be used for this by the private sector road operators.

Apart from this, private road transport operators are being faced with :

* A large increase in the price of fuel (diesel). A price hike of 11 cents per litre was introduced on 1 September 1988 with subsequent hikes of 10 cents per litre in January and 11,7 cents per litre in April this year.

3.2 The Present Scope of Road Transportation in South Africa (Continued)

* A 300 percent increase in licence fees which was introduced on 1 November 1988.

* The introduction of toll roads for which the operators will have to pay to use.

* A declining Rand which has an adverse effect on the cost of *new* vehicles.

* Long lead times (up to 10 months) for the delivery of new vehicles.

* Increased union activities.

3.2.1 Fuel and Licence Fees

Road transporters are convinced that the heavy increases in fuel and licence fees are aimed at boosting rail traffic and not at making the operators pay for the damage their vehicles do to the road. The government has virtually admitted that the 'low' cost of diesel up till now has increased road usage to the detriment of rail transport (18).

The chairman of the Public Carriers Association (PCA), Mr Phil Erasmus, which represents non-government transport operators has accused the government of over-recovering* and states that the

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* The White Paper on Transport states that owners of heavy commercial vehicles must pay an *additional* R253m/year to compensate for the damage their units do to the country's roads. According to Mr Phil Erasmus the government, with the new increase in licence fees will collect nearly R750m/year giving an over-recovery of R497m.

3.2.1 Fuel and Licence Fees (Continued)

transport operations, who work on a margin of approximately 6 percent, will not be able to absorb these increases and will therefore pass it on to the end-user. This will add 9 percent to the price of goods at retail level. (16)

3.2.2 Toll Roads

The introduction of toll roads has also been met with objection, and rightly so. According to the Trucks and Transport Supplement to the Financial Mail (17) the government did not use the 'many millions of Rands' it had collected by way of a levy on fuel for the road fund (10 cents per litre) to build new roads and improve the existing ones, it used that money for other purposes. Furthermore by tolling the main roads, those operators who do not want to pay tolls are forced to use the older longer routes. There is also a danger that the toll system could be used as a means to boost SATS' trading position at the expense of private hauliers by setting unrealistic toll charges. Tolling does, however, have certain advantages, for example, the roads will be maintained properly and shorter distances will be travelled thus reducing wear and tear on the vehicles.

3.2.3 The Declining Rand

As far as the declining Rand is concerned the picture looks gloomy. In the trucking industry, the Rand/Dollar exchange rate is far less significant than the Rand/Deutsche Mark (DM) and the Rand/Yen exchange rates. According to Byers and Braun (18) a strengthening Deutsche Mark and Yen will result in the price of vehicles rising steeply as approximately 60 percent (by value) of the content of most of the current heavy commercial vehicles is imported. (This will obviously differ from model to model).

3.2.3 The Declining Rand (Continued)

Byers and Braun (18) also predict that the manufacturers of vehicles will be reduced to only 3 major producers. With fewer players these manufacturers will be more willing to hike prices at least to a cost recovery level. With a declining Rand these price hikes would be substantial.

With only the large operators (SATS, Cargo Carriers, Tanker Services, Unitrans, Mainline, Hultrons) and the larger ancillary fleets like the South African Breweries, Premier Milling and Escom being able to afford new vehicles, the rebuilding and remanufacturing of vehicles will become more widespread. (18)

With the national fleet ageing and not being replaced with new vehicles due to a weakening Rand, Byers and Braun (18) predict that the quality of the road infrastructure will deteriorate and the government will get a bigger slice of the transportation market due to the private sector ceasing to operate their own fleets.

3.2.4 Trade Union Activities

Most of the transport operators today are vulnerable to strokes by their drivers and freight handlers. Work stayaways in protest against government legislation which will clamp down on union activities have resulted in the transport operators virtually coming to a standstill. The stayaways and strikes have also affected the heavy commercial vehicle manufacturers to such an extent that the *largest producer of heavy commercial vehicles in South Africa has* already contemplated closing its south African operation if the labour situation does not improve. Transport operators are experiencing difficulties in obtaining new vehicles quickly. The labour unrest has resulted in manufacturing lead times of a minimum of 6 months and up to as much as 10 months for the largest heavy commercial vehicle produced in South Africa.

3.2.4 Trade Union Activities (Continued)

With labour unrest spreading it is important that transport operators take pro-active steps to deal with their staff and to reduce their vulnerability in this area.

A possible solution would be to follow the American model (18) where some of the major private transport operators transfer control of the transportation requirement to selected drivers who currently work for them. The transport operators would thus be creating business opportunities for the people currently employed by them.

3.3 Road Transportation and Government Legislation

As mentioned before, road transportation is one of the most over-regulated sectors of the economy, however, attempts are being made to deregulate road transportation. This would have a profound impact on road transportation as we see it today.

A discussion on what regulates road transportation and how road transportation is to be deregulated and what effect this will have on it is given below.

3.3.1 The Regulations of Road Transportation

In South Africa as in most countries all transport of goods by road is controlled in various ways with the result that the transport operators which exist are to some extent the result of the legislation within which the undertakings are required to operate.

Road transportation in South Africa is legislated by The Road Transportation Act (19) and the Road Traffic Ordinance (20) which were designed to achieve the objectives of economic efficiency, the safe operation of commercial vehicles and the optimum use of existing infrastructure.

3.3.1 The Regulations of Road Transportation *(Continued)*

Whether in fact these objectives have been achieved is questionable, as it appears that this legislation has been used to protect the South African Transport Services to a large extent (Section 3.2) to the detriment of the smaller private road transport operators. (16)

The above legislation will be discussed briefly below :

The Road Transportation Act

The Road Transportation Act, No 71 of 1977 sets out the conditions under which people and freight may be transported. The most important of these conditions are :

* A distinction between transport for hire and reward (public carrier) and transport of own goods (private carrier).
* The provision of specified areas within which the transport of freight is totally deregulated.
* The provision of a list of specified commodities which are 'exempted goods' and may be transported anywhere by anyone.
* The provision of exempted areas within specified radii of the transporter's place of business.
* The imposition of the requirement, to hold public, private or temporary permits for all transport of freight by road which falls outside the exemptioned area.
* A body of procedural measures and provisions for stringent penalties for contravention of the Act or regulation.

The Road Transportation Act (Continued)

In practice, these conditions affect mainly those undertakings in the field of public haulage who undertake long distance transport and who would pose a threat to SATS.

The Road Traffic Ordinance

The Road Traffic Ordinance of 1966 is designed to control the dimensions and fittings of vehicles, the loading and operating on the roads and the licensing and control of drivers. The Road Traffic Ordinance requires public carriers to submit to six-monthly examination of vehicles for road worthiness.

The Road Traffic Ordinance affects the transport operator slightly differently in each province in which he operates.

Other legislation which affects freight carriers includes compulsory motor vehicle insurance, the abnormal loads policy and the hazardous substance legislation.

3.3.2 The Deregulation of Road Transport

Byers and Braun (18) believe that deregulation has been introduced by the Government because it views deregulation as an essential element in bringing non-white South Africans into the realm of economic activity. The government believes that deregulation will offer these entrepreneurs an additional opportunity to participate in the capitalist system. This is especially true as far as passenger transportation is concerned, as can be seen with the exponential development of the Black Taxi movement.

As far as freight transportation is concerned deregulation will have a primary impact on the long distance private carriers.

3.3.2 The Deregulation of Road Transport (Continued)

The short haul carriers will also be effected in that there will be a significant increase in competition from small individual operators.

The first positive steps towards the deregulation of road transportation were introduced by the Minister of Transport after a five year National Transport Study, followed by a White Paper (21) setting out a programme of deregulation.

The Minister of Transport announced that existing exempted areas be substituted with several extended exempted areas measured in a radius of 300 kilometres from certain main post offices with effect from December 1, 1987. The Minister has given no indication of the timetable for the next stage of the deregulation process.

The 300 kilometre exempted areas have effectively deregulated several major routes over their entire distance, dependent of course on the site of registration of the operators activities.

Some of the large transport operators can circumvent the deregulation restriction by breaking their operators up into a series of subsidiary companies with headquarters at various strategic decentralised geographic locations.
In terms of these amendments to the Road Transportation Act of 1977, all who choose to take advantage of the new 300 kilometre dispensation also accept the requirements of the Road Freight Quality System (RFQS) as set out in the White Paper (21) published by the government. According to Byers and Braun (18), public carriers will progressively become subject to a greater degree of regulation relating to the Road Freight Quality System. Although their activities will be less restricted than before, the circumstances under which they will operate are to become more stringent and more expensive.

What do the Large Carriers say about Deregulation?

The South African Transport Services would welcome deregulation at any time provided their pre-conditions are met (i.e. the removal of the requirement to run subsidised services). SATS believe that the government will not meet these conditions and will thus continue to prepare for deregulation and will keep increasing their market, waiting for the government to concede to their demands (18).

The Public Carriers Association (PCA) have been against unbridled deregulation for a long time. The PCA, which is dominated by transport operators such as Cargo Carriers, Tanker Services, Unitrans and Hultrans, are concerned with keeping out competition from each other and from possible newcomers. Mr Phil Erasmus of the Public Carriers Association says 'to ensure that proper standards are maintained and that deregulation does not become a wild stampede for new business, it must involve the full implementation of the government's proposed Road Transport Quality System'. (17)

It is apparent that the people who have vested interest in the transport industry view the deregulation of transport as a threat, as it opens the doors for a number of new competitors who, because of lower overhead expenses and lower infrastructure costs could enter the market with extremely competitive rates.

The large transport operators would like to see a situation in which the competition they have, has to compete with them on an acceptable basis and thus many believe that the Road Transport Quality System, which will force the newcomers to the market to operate on the same basis as them, as a 'non-negotiable item in the deregulation process'.

Professor Roy Marcus, former MD of Cargo Carriers (now with Krok Holdings) has this to say about the RFQS :

What do the Large Carriers say about Deregulation? (Continued)

> '..... deregulation cannot come about without a well-structured quality system. A frightening realisation from the American experience* has been the deterioration in standards and the grave concern which is now being expressed in the US about lack of safety. .... the road freight quality system is a non-negotiable item in the deregulation process'.

Another problem which the PCA foresee with road transport deregulation is that SATS may identify a gap in the new regulations and exploit it at the expense of the small carriers. Mr Phil Erasmus believes that SATS' cross-subsidies** have been used to cut rates to below break-even point and thus take an aggressive marketing stance against private hauliers.

However, the small private carriers are going to find it difficult and expense to meet the stringent requirements of the Road Freight Quality System with the end result that more and more of the smaller carriers who cannot cope with the RFQS will move out of the transport business, leaving transport to the specialists.

The large carriers believe that with the deregulation process care must be taken to prevent what happened in American in 1978. Their transport industry has been seriously and in some cases irrevocably damaged.

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* This refers to the deregulation of transport in the United Sates of America in 1978. According to Professor Marcus, rampant price cutting drove 54% of the operators out of business within seven years.

** Cross-subsidisation is charging high tariffs for some commodities and using the profits to pay for losses made in providing other services.

What do the Large Carriers say about Deregulation? (Continued)

Public safety has been compromised and now the administration is spending millions of dollars to try and improve the situation (17).

As far as South Africa is concerned road safety is essential but care must be taken that one set of regulations (pertaining to regulated transport) will be merely replaced by another set of regulations (the RFQS) with the result that road transportation is not deregulated, but merely re-regulated.

Furthermore, if South Africa is to have an efficient transport sector, the government will have to change its method of introducing new deregulatory legislation - the introduction of the exempted areas was chaotic, operators were given insufficient time for preparation and testing stations insufficient time to prepare for the heavily increased demand on services, and must introduce new management at SATS so that the real needs of customers can be met. This would also pave the way for the privatisation of SATS. (18)

3.4 Profile of the Present Transport Industry in South Africa

Very little accurate data is available regarding the total transportation of goods by road, however estimates have been made as a result of surveys conducted by organisations such as The National Institute for Transport and Road Research (NITRR) and the Central Statistics Service (CSS). The latter has more general information regarding road transportation in South Africa including passenger transportation but has very little statistics regarding freight transport. An overview of road transportation in South Africa with specific reference to freight haulage is given below.

3.4 *Profile of the Present Transport Industry in South Africa*
(Continued)

Braun and Byers (18) estimate the number of commercial undertakings that own vehicles classified as commercial vehicles at 42 000. Of these only 4B500 own heavy commercial vehicles i.e. vehicles with a gross vehicle mass (GVM) in excess of 7 500 kilograms. Of the total number of heavy commercial vehicles (3 200) are private carriers* and 28 percent are public carriers**.

The geographic distribution of fleets with a GVM of 5 000 kilograms and greater is illustrated as this is where a company such as Cargo Carriers does not of its business. Cargo Carriers deals mainly in the Pretoria-Witwatersrand-Vereeniging (PWV) area which as can be seen from figure 3.2 is home to 90 percent of the Transvaal's vehicle population. The greater Johannesburg area and the East and West Rand alone account for approximately 77 percent of the total number of fleets.

Figure 3.3 illustrates the percentage distribution by tonnage of the total freight traffic market. It is interesting to note that there is only a marginal difference in the tonnages carried between the 3 other provinces (Natal, Cape and Orange Free State).

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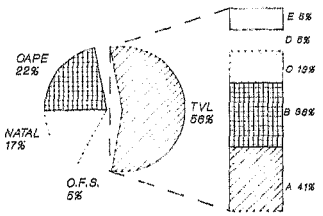
* A business institution who transports his own goods not for reward (example the South African Breweries).

** A transport operator who possesses a motor transport certificate and whose main activity is to transport for reward (example Cargo Carriers).

GEOGRAPHIC DISTRIBUTION OF TRANSPORT FLEETS



LEGEND

A: GREATER JOHANNESBURG
B: EAST AND WEST RAND
C: PRETORIA AREA
D: TRANSVAAL PLATTELAND
E: VAAL TRIANGLE

SOURCE : SEE REF. 18

3.4 Profile of the Present Transport Industry in South Africa
(Continued)

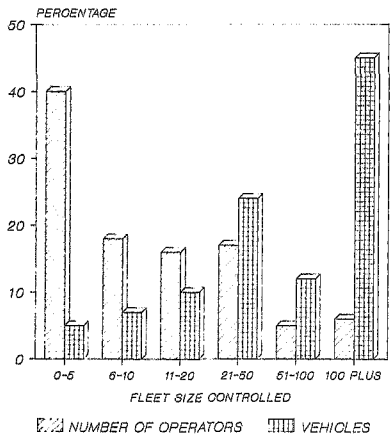
As far as concentration of HCV ownership is concerned a pareto analysis reveals that 26 percent of vehicle operators own 80 percent of the vehicles. A more detailed analysis illustrates that 5 percent of operators own 44 percent of the vehicles (figure 3.4). These 5 percent represent the main members of the PCA, known in industry as 'The Club' i.e. Cargo Carriers, Tanker Services, Unitrans, Hultrans and Main Line. It is quite obvious that they wield enormous clout.

The most popular commodity carried by operators was construction material, which accounted for no less than 48 percent of all goods transported by road. This was followed by bulk liquids (petrols and chemicals) with 19 percent and other manufactured products with 10 percent (figure 3.5).

The average length of haul for construction materials was 21 kilometres (in 1985), the shortest length for all commodities. Agricultural and manufactured products were the most popular items on a ton kilometre basis, this is mainly due to the relatively long distances over which commodities are carried (22).

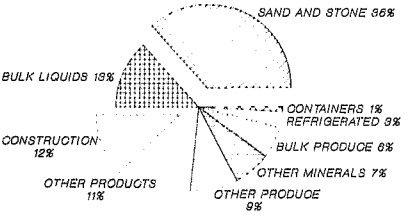
Table 3.1 illustrates the annual average distance travelled per vehicle in South Africa. This distance is split into a laden and unladen distance i.e. how far a vehicle will travel annually loaded and unloaded.

CONCENTRATIONS OF OWNERSHIP OF VEHICLES



SOURCE : SEE REF. 18

COMMODITIES CARRIED BY ROAD 1985



TOTAL TONNAGE 22 341 000

SOURCE : SEE PEF. 15

Table 3.1 Annual Weighted Averages *for Laden* and Unladen kilometres per vehicle

Province	Laden km per Vehicle	*Unladen km* per Vehicle	*Annual Distance* per Vehicle	Percentage Laden Factor when Laden
Transvaal	37 200	28 400	65 600	40,2
Cape	29 500	14 900	4 [illegible]00	44,5
Natal	23 200	19 300	42 500	39,5
O.F.S.	21 300	16 900	38 200	36,2

Source : See Reference 22.

Hamilton (22) ascribes percentage load factor to several factors such as regulations, the permit system, road infrastructure, fleet composition, vehicle types and commodity density. Internal factors such as poor organisation, scheduling and controlling could also have an influence on the efficiency of road haulage fleets. *Deregulation* would help to increase the load factor quite considerably as there is a potential for medium and large *articulated units hauling general freight* semi-trailers to become more productive by carrying return loads.

3.5 Cargo Carriers Limited

The distribution of the steel produced by ISCOR is undertaken usually by one large transport operator who does so on a contractual basis. At present Cargo Carriers Limited has been awarded this contract for a five year period which terminates in February 1992.

An overview of Cargo Carriers Limited is given below in order to clarify what the company's business activities include.

3.5.1 An Overview of Cargo Carriers Limited

Cargo Carriers Limited was founded in January 1956 by Mr Desmond Bolton as a bulk road transportation business operating initially on a contractual basis to the then new gold mines in the Kinross/Evander area. Cargo Carriers has since expanded its operations and over the years has become a major bulk road transport contractor which specialises in the transport of goods for major companies under long term contracts.

Cargo Carriers has pioneered many aspects of goods transportation by road and has over the past thirty one years expanded its facilities to provide a service for the bulk haulage operations of most major industrial sectors including mining, steel, sugar, cement, chemicals, fuel and other industries.

To date most of the growth of Cargo Carriers has been through the natural expansion of its own activities. Acquisitions, although relatively few, have been strategically motivated. (The present steel contract which contributes up to 25 percent of the group revenue was acquired by buying out a company called Bagley Stephens which at that stage had the sole right to cart steel on behalf of ISCOR. This acquisition thus gave Cargo Carriers a monopoly in the steel distribution sector and has boosted its turnover considerably).

It appears that this policy is changing since the listing of the company on The Johannesburg Stock Exchange (JSE) in October 1987. This listing has given Cargo Carriers a large cash injection to fund the growth of the company. The company has started acquiring business in strategic areas (the timber industry for example) in order to get a foothold in new territories, however not all these acquisitions have been successful.

3.5.1 An Overview of Cargo Carriers Limited (Continued)

Cargo Carriers' business philosophy hinges around the needs of its customers who are now requiring a package of services which would include the importation of raw materials into the manufacturing environment through to the subsequent delivery of the finished product to the end user, and includes the intermediate processes of warehousing, storage, handling, consolidation and many other processes. The company has been the innovator of many new systems involving the handling of bulk materials and various cost improvements methods, and is today regarded as the industry leader.

Cargo Carriers has moved away from the idea of simply being a transport operator and now regards itself as a company concerned with 'the movement' of products. This extends beyond the present practice of road transportation and would include alternatives such as pneumatic of hydraulic conveyance of freight by pipeline. Although nothing like this has been implemented to date, it is a concept which Cargo Carriers aspires to.

Direct involvement of executive control and management at all levels coupled with motivational incentives to employees have ensured a capable and ' rly stable workforce. Cargo Carriers has, however, been subject to strikes and work stayaways. Presently Cargo Carriers employs 2 500 persons, this figure however could vary as high as 3 000 persons depending on seasonality of product which is being transported. This is especially true for agricultural products such as sugar cane.

Cargo Carriers operates 30 branches situated throughout Southern Africa and has based its business principally on long term contracts. Its fleet travels in excess of 50 million kilometres annually and in the process moves more than 121,5 million tons of goods. Each of the 30 branches which Cargo Carriers operates is responsible for a particular contract. When a new contract is secured a new branch, if it is required, will be opened to manage that contract.

3.5.1 An Overview of Cargo Carriers Limited (Continued)

As mentioned, Cargo Carriers has expanded into most major sectors of the economy, however some of the operations have not turned out to be as successful as Cargo Carriers would like them to be. This is especially true in the sugar operation where Cargo Carriers is locked into a contract which is running at a considerable loss. Cargo will have to absorb this loss until the contract expires. It appears that the cement contracts are going to follow the same pattern as the sugar, because the company's operating expenses in that sector are too high to make a profit.

Cargo Carriers is virtually independent of outside sources for the maintenance of its fleet which presently comprises in excess of 800 heavy duty vehicles and 1 500 trailers and ancillary equipment. Cargo Carriers has established and developed its own sophisticated vehicle maintenance and repair workshops, a tyre retreading plant, a diagnostic centre and various driver training schools.

An age analysis of the vehicles of Cargo Carriers (Appendix B) reveals that 26 percent of the fleet is older than 7 years and that only 8 percent of the fleet is older than 10 years. These figures* depict a fleet which falls within the average life cycle of a vehicle (8 years). This is quite surprising as, to date, Cargo Carriers has not had a formal vehicle replacement policy. The only vehicle replacement policy which as existed is a 'graveyard' policy where new vehicles are purchased and are then used until they are scrapped - they are literally 'driven into the ground'.

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* The accuracy of these figures is questionable. The figures were obtained from the management information system of Cargo Carriers. The MIS system does not distinguish between vehicles which have not been refurbished and those that have. An 8 year old truck as given in Appendix B might have been completely refurbished at some stage thus making its age as obtained from the MIS inaccurate.

3.6.1 An Overview of Cargo Carriers Limited (Continued)

Although Cargo Carriers is the largest public transport operator in South Africa (apart from SATS) it still faces considerable competition from the other large operators such as Unitrans, who has a fleet of 1 200 vehicles, Tanker Services who specialise in the transportation of bulk liquids and has a fleet of 600 vehicles. Other competitors would include Hultrans (especially in the sugar cane operations) and Mainline. Cargo Carriers is also facing considerable competition from the Truck-Hire companies such as Perkins and have in fact lost contracts (such as the Reckitt and Coleman contract) to such competitors.

It is quite possible that a company such as Unitrans could win the steel contract from Cargo Carriers when it has to be renewed in 1992. Although Unitrans at present does not have the necessary infrastructure that Cargo Carriers has to transport the steel from ISCOR, there is no reason why it cannot develop it and have it ready by the time the contract has to be renewed. As mentioned previously, this would have serious ramifications for Cargo Carriers.

With the recent increase in licence fees, fuel, the introduction of tolling on the major routes as well as a declining Rand it appears that Cargo Carriers, along with other transport operators, are in for a rough time. Cargo Carriers will have to improve its operation by having better management as well as employing modern techniques such as industrial engineering in order to offset the increases in its operating expenses by improved efficiency and productivity.

3.6 The Distribution as seen from Cargo Carriers' point of view

As far as Cargo Carriers is concerned it has to, at all times, provide ISCOR with the best possible service. It therefore has to ensure that all the loads that are available to ISCOR's customers must be delivered to them on time as efficiently as possible. It is Cargo Carriers responsibility to schedule their vehicles in such a manner that it maximises its 'output' (i.e. the number of loads it delivers) from ISCOR's loading bays.

As previously mentioned, the service level that Cargo Carriers is *providing to ISCOR at present is poor*, therefore Cargo Carriers has to take tentative steps to improve this.

Cargo Carriers is faced with three possible solutions to improve its service to ISCOR. These are discussed below :

3.6.1 Increa[illegible] Size of the Present Steel Fleet

This is an expensive solution that does not address the cause of the problem but merely treats the symptom. A small increase in the fleet size is extremely costly, to increase the number of vehicles by 10 percent, for example, a capital outlay of approximately R4 200 000 would be required. On average the fleet would have to be increased by 20 to 25 percent to cope with peak demand, this represents a capital outlay of between R8 400 000 and R10 200 000 (Appendix C). Apart from the cost associated with this solution there are other disadvantages as discussed below.

(i) One cannot keep increasing the size of the fleet in proportion to demand, there exists a threshold point beyond which any increase in the number of vehicles would have a retarding effect on the number of loads being transported.

3.6.1 Increase the Size of the Present Steel Fleet

The congestion due to having too many vehicles in the system (in the loading bays at ISCOR, at the weighbridge and at the offloading bays at ISCOR's customers) would be counterproductive. Apart from this there is also the difficulty of obtaining new vehicles to cope with an increase in demand, due to the long lead times of the heavy commercial vehicle manufacturers.

(ii) If the fleet could be increased to meet the peak demand, and then suddenly the demand slacks off for a lengthy period, what will become of the excess vehicles, prime movers, semi-trailers, drivers and lorrymates.

Excess capacity could be used in other contracts provided there is a need for it and that the prime movers and semi-trailers are of the correct configuration (skeletal steel trailers, for example, could not be used to haul anything apart from steel coils unless they are modified).

(iii) Vehicles, drivers and lorrymates can not be left idle for long periods in the event of there being no work for them. This would lower the productivity of the fleet considerably as well as demoralise the drivers and their assistants. A possible solution, if such an event would occur, would be to sell the vehicles and retrench the drivers and lorrymates. However, this would face tremendous resistance from the trade union and could possibly lead to a wholesale strike in the Cargo Carriers group. Vehicles which have been sold during slack periods would be difficult to replace, due to the long lead times of the heavy commercial vehicle manufactures, when the demand picks up and they are needed.

3.6.2 Sub-Contractors

Sub-contractors can be divided into 2 categories viz. the owner-driver sub-contractors, *i.e. the owner of the vehicle is also* the driver of the vehicle and the owner-non-driver sub-contractors, i.e. the owner of the vehicle employs drivers to drive for him.

At present Cargo Carriers employs both types of sub-contractors during periods of peak demand. There are both advantages and disadvantages associated with employing sub-contractors, these are discussed below :

(i) A major disadvantage of using sub-contractors is the lack of commitment by the sub-contractors to the contracting company. Sub-contractors will make themselves available to contracts which pay the highest rates and are not too concerned about loyalty to the contracting company. This *is especially true during periods when* there is an increased demand for them. (The owner-driver sub-contractors are reasonably more committed to the contracting company than the other sub-contractors).

(ii) Sub-contractors also share in the profit from the haul with Cargo Carriers. Thus, during periods of peak demand when a large number of sub-contractors are employed, Cargo Carriers' share of the profit will become smaller.

(iii) Sub-contractors can (and in some cases do) spoil the image of Cargo Carriers - many of them use old, dirty and poorly maintained prime movers to pull the well looked after semi-trailers belonging to Cargo Carriers. Irresponsible driving by the sub-contractors will also have a negative effect on the positive public image which Cargo Carriers tries to maintain.

3.6.2 Sub-Contractors (Continued)

The advantages of using sub-contractors include :

(i) No capital outlay for the purchasing of vehicles is required.

(ii) No hiring and firing of drivers and lorrymates.

(iii) Sub-contractors are easy to recruit, provided the rates are competitive.

(iv) No maintenance and repairs to vehicles.

As with increasing the size of the fleet, using sub-contractors is a temporary solution to the problem.

3.6.3 Establishing a Staging Operation

This is the ideal solution as it is the only method whereby steel can be moved out of ISCOR on a 24hr basis (thus relieving any congestion that would occur on the floor in the early mornings and after weekends at ISCOR) and delivered to ISCOR's customers on an eight hour basis. The use of a shunting depot would provide that bridge between the differential operating hours of ISCOR and its customers.

Furthermore, by shunting semi-trailers to a central depot, better utilisation is made of the fleet, dead kilometres will be minimised and the size of the steel fleet can be reduced thus increasing the productivity of the fleet.

The establishment of a staging depot (shunting depot) will cost in the region of R5 700 000 (Appe D) which makes it a better option than simply increasing e size of the steel fleet. (Appendix C). The running costs of the staging operation will

3.6.2 Sub-Contractors (Continued)

be marginally more than for the present operations (Appendix G), however, a saving of 27 prime movers will be achieved. Sub-contractors, if necessary, can still be used in conjunction with the staging operation.

As previously mentioned, the present steel contract which Cargo Carriers has entered into with ISCOR expires in 1992. This contract accounts for approximately 20 percent of Cargo Carriers' total revenue and if it is not renewed on its expiration the result would be sorely felt by Cargo Carriers. The establishment of a shunting operation would provide a good solution to the problem previously discussed and would improve Cargo Carriers' chances considerably of being re-awarded the steel contract in 1992.

In the next chapter the method of investigation into this problem will be discussed along with some ideas on how the staging operation will function.

CHAPTER 4

4. Investigation

In this chapter the method of investigation of this problem is discussed along with the philosophy of the proposed staging operation.

4.1 Investigation Method

The investigation regarding this project is divided into three phases, each of which are discussed below. The three phases are :

(i) Investigation phase.

(ii) Analysis phase.

(iii) Concluding phase.

4.1.1 Investigation Phase

This phase entailed reviewing all the work that has been carried out on this project in the past, as well as collecting new data where necessary. Data on ISCOR's loading bays, customers and products as well as on the Cargo Carriers operation, including an analysis of the fleet, its depots and its accounting system - specifically on how the profit and loss statement of each of the depots is constructed was collected.

ISCOR's Loading Bays

All 13 loading bays at ISCOR's Vanderbijlpark were visited to examine how the loading of semi-trailers is conducted as well as to ascertain what type of products are loaded in each loading bay and which loading bays are the most congested. Similar data was obtained for Pretoria and Alrode from discussion with the branch managers at each of these depots. The weighbridges were also visited. Numerous interviews were also conducted with Senior ISCOR employees (at Divisional Manager level) in order to obtain further information relevant to the loading and distribution of steel.

ISCOR's Customers

Cargo Carriers transports steel to approximately 200 customers on behalf of ISCOR. A pareto analysis performed on these customers reveals that the 10 biggest customers absorb approximately 80 per cent of the steel that Cargo Carriers transports, thus for purposes of simplicity, the project focuses on these vital few customers, ignoring the 'trivial many'. The following data was collected regarding these customers :-

The customer's name, physical address, opening times, closing times, the type of product the customers consume and the tonnages consumed over a six month period. (Appendix E).

This is necessary in order to determine which customers would be served via the staging operation and which would receive direct delivery. A few of these customers were visited in order to fully appreciate the problems they experience with the steel distribution.

ISCOR's Product

An analysis was conducted on the products which Cargo Carriers transports for ISCOR from each of ISCOR's production centres in the PWV area. *This is necessary in order to determine the* loading and unloading times of the products, which products need to be covered when being transported, what type of semi-trailers are required for transporting them and what the average mass of each product is, in order to determine the size of the prime mover required to pull the semi-trailer.

The Cargo Carriers Fleet

Cargo Carriers' fleet was analysed in order to determine the age of the fleet, the make up of the fleet (i.e. the different vehicle brands which make up the fleet), the power (in horse power) of the prime movers, the number of axles on the semi-trailers, the *maximum* permissible mass of the semi-trailers, as well as the permissible load types of the semi-trailers.

This analysis was required in order to determine which prime movers and semi-trailers could be used in the staging operation. The staging operation requires prime movers with a fairly high horse power (210 Kw and *greater) due to the heavy payloads* which are being transported. Legally, for every ton being moved - including the mass of the vehicle - 4,17 Kw (5,59 Hp) of power is required at sea level. It is common practise at higher altitudes to have 5,0 Kw (6,7 Hp) of power per ton being moved, for naturally aspirated engines (non turbo charged engines).

The semi-trailer configuration is also important - the heavier the load the more axles are required on the semi-trailer, thus for the staging operation only tandems and preferably tridems would be suitable due to the heavy payloads.

The Cargo Carriers Fleet (Continued)

An investigation was also conducted into the running costs of the fleet. The running costs of the vehicles at the 3 steel depots were analysed over a period of 12 months and averages were determined for fuel, tyres and maintenance and repair costs in units of cents per kilometre (cpk).

The Cargo Carriers Steel Depots

The 3 steel depots, viz. Vanderbijlpark, Alrode and Pretoria were visited on numerous occasions in order to gain insight into their existing operations, with a view of seeing what impact a staging depot would have on them. Furthermore, the operating costs of the depots were investigated in order to identify possible areas where costs could be saved if a staging depot was established. The concept of a staging depot was also discussed, at length, with each of the depot managers in order to fully appreciate their views on this subject. A brief description of the depots is given in Appendix F.

The Cargo Carriers Accounting System

The profit and loss statements of each of the depots over a period of one financial year were analysed in order to determine how each entry in that profit and loss statement was arrived at and how each entry in the profit and loss statement would change when a shunting operation is introduced. This project will show that the shunting operation would result in a reduction of vehicles but would increase the running costs for the remaining vehicles.

4.1.2 Analysis Phase

During this phase of the project a detailed analysis into the 'mechanics' of the shunting operation was conducted. This analysis entailed calculating the number of loads which have to be shunted, how many prime movers and semi-trailers are required, staffing requirements of the new operation, the cost of establishing a new depot as well as the calculation of the running costs of this new depot. This was calculated by constructing a profit and loss statement for the running of the new depot. In this part of the analysis various assumptions were made in order to simplify the calculation.

The analysis phase which is discussed in the next 2 chapters begins with an analysis of the existing scenario.

4.1.3 Concluding Phase

In the concluding phase of this project a detailed investigation was conducted into the building of a new depot. This included determining its location, what facilities it would require, the staffing of the new depot, and the cost of building it.

The rest of the investigation methodology included developing the philosophy of how the shunting operation would work, without going into the detailed mechanics (which will be discussed at a later stage) of this operation.

4.2 The Philosophy behind the Staging Operation

The proposed staging operation would be divided into 5 sub-operations. Three of these would be the existing direct delivery and bridging operations which have been scaled down, the other 2 operations will be shunting operations. These operations are listed below.

4.2 **The Philosophy behind the Staging Operation** (Continued)

* The Vanderbijlpark direct distribution operation
* The Vanderbijlpark-Alrode shunting and bridging operation
* The Alrode direct operation
* The Pretoria direct operation
* The Pretoria-Alrode shunting operation.

This dissertation will show that Cargo Carriers will be able to deliver steel in a more efficient manner than previously possible. These operations are discussed in more detail below.

4.2.1 **The Vanderbijlpark Direct Distribution Operation**

This operation involves the direct delivery of steel from ISCOR's Vanderbijlpark works to customers in the PWV area. These deliveries will be undertaken in the same manner as the present steel operation (See Section 2.7).

The Vanderbijlpark fleet will be used solely for this distribution operation. The loads chosen for the direct distribution operation will be all those loads that have to be delivered in the Vanderbijlpark area, where staging the loads at Alrode would obviously be unnecessary. The direct distribution operation would also deliver into the greater Johannesburg area to certain customers who have suitable offloading facilities and have no problem with trucks queuing to offload so that quick turn around times are achieved, thus making it easier and quicker to deliver directly to the customer as opposed to staging the loads at Alrode.

The entire Vanderbijlpark steel depot would be scaled down in terms of the number of vehicles, the number of staff as well as its workshop facilities so that it can handle the smaller direct distribution operation. All the vehicles and staff members that have been relieved by reducing the size of the depot will be incorporated in the new, bigger Alrode depot. Vehicles that have been saved by the entire staging operations would be transferred to new or existing contracts.

4.2.2 The Vanderbijlpark-Alrode Shunting and Bridging Operation

This operation involves the staging of the steel loads from ISCOR's Vanderbijlpark works at a central depot in Alrode.

The Alrode fleet will be split into two dedicated fleets. The one fleet will be used for the direct delivery operation form ISCOR warehouse in Alrode to the customers. The other fleet will be dedicated to the shunting operation, which will operate as follows.

During the night shift the fleet will transport steel from ISCOR's Vanderbijlpark works to the Alrode depot, the loaded semi-trailers will be parked and unhitched. The prime movers will then hitch empty semi-trailers and return to Vanderbijlpark for the next load. The last load collected will not be unhitched but the combination, i.e. the prime mover and the loaded semi-trailer will be parked waiting for distribution in the morning.

During the day shift the same prime movers will be used for the bridging operation, i.e. distributing the loads to the customers. At the completion of this shift all the semi-trailers in the depot will be empty, ready for the evening shift. The customers who will be serviced via the shunting operation all fall within the greater Alrode area and to a small extent the Pretoria area, when it is more efficient to have the customers serviced via the shunting operation that to deliver directly to them.

4.2.3 The Alrode Direct Distribution Operation

This operation involves the transporting of steel from the ISCOR warehouse to the customers. As mentioned previously a fleet based at Alrode will be dedicated to this operation. The status quo as far as this operation is concerned will remain intact apart from operating out of a new depot.

4.2.4 The Pretoria Direct Distribution Operation

As with the Alrode direct distribution operation no changes will be made to this operation which is responsible for deliveries to the greater Pretoria area.

4.2.5 *The Pretoria-Alrode Shunting Operation*

The Pretoria depot is involved with the Alrode shunting operation due to its deliveries to the Johannesburg and Vanderbijlpark areas. The loads will be shunted to Alrode and thus bridged to the customers with the Alrode fleet. Loads from Alrode or Vanderbijlpark due for Pretoria customers can also be shunted to Alrode and then bridged to Pretoria customers with the prime movers taking empty semi-trailers to Pretoria. This will be discussed further in Section 5.3.3.

CHAPTER 5

5. The Two Distribution Scenarios

This chapter focuses on the cost of the existing and new scenarios of the steel distribution process. As far as the existing scenario is concerned an attempt will be made to calculate the present cost of this operation and hence the profitability.

As far as the new scenario is concerned i.e. the proposed shunting operation, all the calculations necessary to predict the profitability of this operation will be dealt with here. This will include staffing requirements, fleet requirements and loading requirements. The forecasting of the profit the new distribution operation will make is dealt with in the next chapter.

5.1 The Existing Steel Distribution Scenario

For purposes of simplicity the steel distribution operation will be split into the 3 major branches, viz. Vanderbijlpark, Alrode and Pretoria.

All figures are for the period 1 March 1987 to 28 February 1988. The running costs per kilometre (cents per kilometre - cpk) are historical averages for each of the depots.

Table 5.1 Running Costs for the Steel Depots

	VANDERBIJLPARK	ALRODE	PRETORIA	TOTAL
Annual Km	8 816 498	1 083 122	1 364 100	11 263 720
Tyres (cpk)	791 300 (8,98)	81 300 (7,51)	199 100 (14,60)	1 071 700
Fuel (cpk)	3 356 100 (38,07)	383 500 (35,41)	556 400 (40,79	4 296 200
M & R (cpk)	2 333 600 (26,46)	309 800 (28,60)	481 900 (35,33)	3 124 700
Lubrication (cpk)	149 900 (1,70)	23 000 (2,13)	22 300 (1,64)	195 200
TOTAL	6 630 900	797 600	1 259 700	8 687 800

Source : Financial Statements of Cargo Carriers for the year ended 28 February 1988.

The annual running expenses for the existing scenario is R8 687 800. This represents approximately 35 percent of the total running costs (administrative and operational expenses) of the present distribution system (Table 5.2).

Table 5.2 Total Cost of Present Distribution Operation

	VANDERBIJLPARK	ALRODE	PRETORIA	TOTAL
Administrative Expenses	888 600	402 600	283 500	1 574 700
Operational Expenses	15 929 000	4 252 800	3 105 600	23 286 600
TOTAL	16 817 600	4 655 400	3 390 300	24 663 300

Source : Profit and Loss Statement of Cargo Carriers for the year ended 28 February 1988.

5.1 The Existing Steel Distribution Scenario

The total cost of operating the present steel distribution system is approximately R24 900 000 before the corporate administration fee is taken into account. This corporate administration fee represents the overhead costs of the head office which is allocated to each branch for services rendered to that branch.

The total corporate administration fee for the 1987 financial year was R3 771 500 bringing the grand cost of the present steel administration system to R28 634 800.*

The infrastructure which supports this steel distribution system is described in Appendix F and the profit and loss statements for the year ended 28 February 1988 are given in Appendix F. Table 5.3 gives a summary of the tonnages moved during the 1987/88 financial year out of each depot and the number of prime movers responsible for this haulage. The table also includes other items of interest such as payload and average distance of each trip for each depot. The figures representing tonnage and number of vehicles are particularly important as the same tonnage has to be moved with the new distribution system and this had to be done with fewer vehicles shunting the loads.

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* With the new staging operation the corporate administration should remain similar, hence when comparing the old and the new operations from a cost point of view it is only necessary to take into consideration the administrative and operational expenses.

Table 5.3 Attributes of Present Steel Distribution Operation

	VANDERBIJLPARK	ALDUS	PRETORIA	TOTAL
Tons Moved	1 599 100	188 360	223 890	2 011 350
Kilometres Travelled (Km)	8 409 000	1 081 070	1 267 030	10 759 000
No of Loads	59 220	9 083	8 889	76 183
No of Vehicles	102	16	18	136
Payload (tons)	27	23,3	25,2	25,17
Average Trip Distance (Km)	142	134	141	139,6
Loads per Vehicle per day	2	2	2	6

All the other figures are based on statistics and other documentation such as Log Sheets collected by Cargo Carriers.

5.2 The New Steel Distribution Scenario

It is assumed, in order to calculate the volume of steel moved by each depot in the new staging operation, that Cargo Carriers will operate 250 days per year (104 days are weekends during which no work will be done and the other 11 days are public holidays during which Cargo Carriers will remain closed).

5.2.1 Loads to be Shunted

As can be seen in Table 5.3 a total of 2 011 350 tons of steel is available annually for distribution by Cargo Carriers, of this 1 599 100 (Table 5.3) will be distributed out of Vanderbijlpark either directly to customers or to a staging depot and then to the customers.

5.2.1 Loads to be Shunted (Continued)

The average historical payload leaving the Vanderbijlpark works is 27,0 tons per vehicle (based on weighbridge documentation) thus the 1 599 100 tons delivered annually represents 59 220 loads. An additional 25 740 loads are carried annually by sub-contractors working for Cargo Carriers. (According to the financial statements of Cargo Carriers).

The 59 220 loads annual represent 237 loads leaving the Vanderbijlpark works daily (working a 5 day week). Of these loads 80 will be delivered directly to customers in the greater Johannesburg area and approximately 77 to customers in the Vanderbijlpark, Meyerton and Vereeniging area thus leaving 80 loads to be delivered to customers via the staging depot.

The 157 (80+77) loads for daily direct delivery to customers were chosen based on the following :

* All loads to customers in the greater Vanderbijlpark area would be delivered directly to them as it is obviously much quicker and easier delivering them directly than staging them in Alrode and then having to bring them all the way back to Vanderbijlpark.
* Customers in the greater Johannesburg area were chosen for direct delivery if it was possible to achieve quick turnaround times (1/2 hour or less) at their offloading facility and who do not experience any problem with lengthy queues of vehicles waiting to offload at their offloading facilities.
* Customers who are prepared to (and who do) keep their loading bays open longer than the normal operating times and who can receive up to 3 direct deliveries daily.

5.2.1 Loads to be Shunted (Continued)

All the customers records were investigated and those that met with the above requirements were chosen for direct delivery and the balance (approximately 80 loads daily) were chosen for the staging operation.

The number of loads to be distributed out of the Pretoria depot will remain the same. For purposes of analysing the new distribution system the loads shunted out of Vanderbijlpark will be 'added' to the Alrode loads and the tonnage at Vanderbijlpark will be reduced proportionally. The loads available for distribution from Vanderbijlpark and Pretoria will be the loads for direct delivery only whereas the loads at Alrode will be for both direct delivery (i.e. the existing direct delivery operation) and those loads that are delivered via the shunting operation. Table 5.4 summarises the loads available and how they will be distributed.

Table 5.4 Load Split for the Staging Operation

	VANDERBIJLPARK	ALRODE	PRETORIA	TOTAL
Current Tonnage	1 599 100	188 360	223 890	2 011 350
Current Loads	59 220	8 083	8 880	76 183
Future Tonnage	1 059 100	728 360	223 890	2 011 350
Future Loads	39 220	28 083	8 880	76 182
Difference - Loads	-20 000	+20 000	0	
Loads : Direct	39 220	8 083	8 880	56 183
Loads : Shunt	-	20 000	*	20 000
Daily Loads : Direct	157	32	36	225
Daily Loads : Shunt	-	80	-	80

* Although no loads are indicated for shunting from Pretoria, the Pretoria depot will shunt loads on the odd occasion to Alrode whenever this is required.

5.2.2 Fleet Requirements

One of the aims of establishing a staging operation is to achieve a reduction in the number of prime movers required to move the *same volume of steel*. The fleet requirements for each of the steel depots is discussed below.

(i) The Vanderbijlpark Depot

As can be seen from Table 5.4 the Vanderbijlpark depot will be responsible for delivering 157 loads daily to customers. These loads will be split into 80 loads for the greater Johannesburg area and 77 loads for the greater Vanderbijlpark area.

It is possible to make 3 deliveries per day per vehicle to customers in the Johannesburg area and 4 deliveries per day to customers in the Vanderbijlpark area (Appendix H). With each vehicle carrying approximately 27 tons of steel the fleet requirements for the Johannesburg deliveries will be 28 vehicles (including one spare vehicle) and for the deliveries to the Vanderbijlpark area 20 vehicles will be required (including one spare vehicle).
An equal number of skeletal semi-trailers would also be required i.e. 28 for deliveries to Johannesburg and 20 for delivery to the greater Vanderbijlpark area. A summary of the Vanderbijlpark depot fleet requirements is given in Table 5.5.

(ii) Alrode Depot

The Alrode depot is split into the following operations :

(ii) Alrode Depot (Continued)

* A direct delivery operation from the ISCOR warehouse to customers.

* A shunting operation i.e. shunting steel during the night shift from ISCOR's Vanderbijlpark works to the Alrode depot.

* A bridging operation which involves the delivery of the shunted steel to the customers during the day shift.

For the distribution of steel from the ISCOR warehouse in Alrode which operates during the day shift, the status quo will remain intact, i.e. 32 loads per day are available for distribution by 16 vehicles, each carrying 2,0 loads per day (as is presently being achieved).

The shunting operation at night will transport 80 loads from Vanderbijlpark to Alrode over approximately 10 hours. Each vehicle will be capable of 3 loads per shift, thus requiring 27 vehicles for this operation. These vehicles will be taken from the vehicles required for the bridging operation plus a pool of 6 spare vehicles to allow these vehicles which are running 24 hours a day, time for maintenence and repairs and also to provide a buffer against vehicles which are involved in accidents or breakdowns during their operation.

These vehicles will also be responsible for the delivery of the steel to the customers during the day shift. Table 5.5 gives a summary of the fleet requirements for this depot.

The semi-trailer requirements for the Alrode depot would be as follows :

(ii) Alrode Depot (Continued)

Each of the existing prime movers requires a semi-trailer and each of the 27 vehicles which will be shunting and bridging the steel will require 3 semi-trailers (during the shunting operation the semi-trailers will remain loaded as explained in Section 4.2.2. Thus 3 semi-trailers will be required per prime mover as each prime mover will make 3 trips during the shunting and bridging operation). Table 5.5 provides a summary of the fleet requirements for the Alrode depot.

(ii) The Pretoria Depot

The size of the Pretoria fleet will be reduced from 18 to 12 vehicles (including 2 spare vehicles) as a result of Pretoria's involvement in the staging operation.

The Pretoria fleet will be used in 5 different operations, the largest one being the delivery of steel to customers in Johannesburg via the Alrode depot. Twenty loads per day are available for this, thus 4 vehicles will be required, with each vehicle carrying 5 loads per day, as is presently being achieved on the Pretoria-Johannesburg run. A further 2 vehicles will be required for delivery of steel to customers in the Vanderbijlpark area via the staging depot in Alrode. Eight loads per day are available for this, and since these vehicles only have to run to Alrode, 5 loads per vehicle per day can be achieved.

The distribution operation to customers in the PRetoria area requires a further 2 vehicles. It is possible to deliver 3 loads per vehicle per day to ISCOR's customers in Pretoria (based on historical average), thus 2 vehicles can adequately cope with the 6 loads available for distribution in Pretoria daily.

(iii) The Pretoria Depot (Continued)

Two vehicles are required for the preloading and shunting of loads in ISCOR's Pretoria works and another 2 vehicles for ad hoc work which is presently undertaken at the Pretoria depot.

A total of 30 semi-trailers is required due to the 6 prime movers which will be shunting loads to the Alrode depot. These 6 vehicles will each require 4 semi-trailers to deliver 5 loads per day (since the empty trailers can be hauled back to Pretoria the same day and be re-used). The other 6 vehicles will each require 1 semi-trailer.

Table 5.5 Fleet Requirements for the New Distribution Operation

	VANDERBIJLPARK	ALRODE	PRETORIA	TOTAL
Current				
Prime Movers	102	16	18	136
Semi-Trailers	135	16	20	171
Future				
Prime Movers	28+20=48	16+33= 49	12	109
Semi-Trailers	48	16+99=115	30	193
Difference				
Prime Movers	-54	+33	- 6	-27
Semi-Trailers	-87	+99	+10	22

From Table 5.5 it is clear than an overall reduction of 27 prime movers will be achieved with the introduction of the shunting system. As far as semi-trailers are concerned an additional 22 will have to be purchased. However, the savings in the prime movers outweighs the capital outlay for new semi-trailers considerably (Appendix H)>

(iii) The Pretoria Depot (Continued)

As far as the choice of prime movers and semi-trailers for the staging operation is concerned, the following guidelines should be followed :

* For all the larger deliveries such as the direct distribution from Vanderbijlpark into the Johannesburg area, the distribution from Pretoria to Johannesburg and the shunting of steel from Vanderbijlpark to Airode, the newer and more powerful prime movers (such as the Mercedes Benz 185 Kw to 285 Kw prime movers with skeletal trailer where possible) should be used. The newer and more powerful vehicles will be more efficient on the longer hauls with the heavy payload.**

* For local distribution the older less powerful vehicles such as the Mercedes Benz 160 Kw prime movers should be used as they do not have to travel long distances with heavy payloads.

Although at present Cargo Carriers does not have an official vehicle replacement policy, it must be borne in mind that when purchasing vehicles for the steel fleet only the more powerful vehicles (from 330 Hp onwards) should be purchased. The steel fleet at present is far too

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** This is based on the fact that for each ton of mass moved 4,17 Kw of power is required at sea level. At higher altitudes a ratio of 1 ton : 5,0 Kw is acceptable. (According to technical information published by Mercedes Benz South Africa (MBSA).

(iii) The Pretoria Depot (Continued)

underpowered, resulting in the inefficient distribution of the steel.*

5.3 Mechanics of the Staging Operation

The operation of the various depots for the staging operation is discussed below. For purposes of simplicity each of the depots will be dealt with separately.

5.3.1 The Vanderbijlpark Operation

As previously mentioned, this operation is only responsible for the direct distribution of steel to ISCOR's customers.

The Cargo Carriers contract controller will receive daily, from ISCOR, a load schedule giving detailed information on which loads go to which customer and the tonnage of each load. From this load schedule the contracts controller will manually work out which loads are to be shunted to Alrode that night and which are to be delivered directly to ISCOR's customers during the next day. (The contract controller will receive this load schedule a day in advance so that he has adequate time to plan accordingly).

Once the loads are split up, the 157 loads available for direct delivery (80 loads for Johannesburg, 77 Loads for the *Vanderbijlpark area) will be executed in the same manner as is* presently being done for loads delivered out of Vanderbijlpark (Section 2.7).

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* Investigations have shown that at present Cargo Carriers does not follow the recommendation of 5 Kw of power necessary to move every ton. At present, for example, a 30 ton mass (vehicle and payload) is driven by a 120 Kw engine whereas it should be at least 150 Kw.

5.3.2 The Alrode Operation

It must be realised that when all the variations and irregularities which occur in the real world are taken into account, a large number of different scenarios of the distribution of steel arise. For purposes of this simplicity only the most likely scenario which will take place is discussed.

The Alrode operation will work 2 shifts (during the night and day) and will operate as follows :

(i) The Night Shift

The shunting operation will employ 2 contracts controllers during the night shift. One will be stationed at Alrode, his responsibilities will include the controlling of the vehicles entering and leaving this depot during the night (including the allocating of parking bays to the loaded semi-trailers). The other contracts controller will be positioned at ISCOR's Vanderbijlpark works and his duties will include the scheduling of vehicles at ISCOR i.e. *allocating the shunting vehicles to the correct* loading bays in order to ensure that the correct loads are shunted, and will also be responsible for the optimisation of the vehicles in order to prevent unnecessary queuing and congestion at the loading bays.

The vehicles entering and leaving ISCOR at night will follow the same procedure as during the day shift as described in Section 2.7).

The shunting of the loads will begin at approximately 19H00 and will continue all through the night until all 80 loads have been shunted to Alrode. (All facilities at ISCOR's Vanderbijlpark works will be open 24 hours a day).

(i) The Night Shift (Continued)

When the vehicles arrive at Airode the drivers will hand in all the documentation pertaining to that load to the contracts controller who is housed at the entrance to the depot. The contracts controller will then give the driver a disc with a number on it, indicating the parking bay where the driver must park the loaded semi-trailer, as well as instructions on which empty (or full) semi-trailer to take back to Vanderbijlpark.

The contracts controller then places all the documentation pertaining to that load in the pigeon hole which corresponds to that disc number. The driver will attached the disc onto a hook on the semi-trailer once he has uncoupled it and then proceed to the parking bay, specified by the contracts controller, to couple the empty (or loaded*) semi-trailer and then proceed back to Vanderbijlpark.

For the last 27 loads that are shunted the prime movers will remain coupled to the semi-trailers parked in the parking bays allocated for the articulated vehicles. These loads will then be distributed first during the day shift. The contracts controller at ISCOR will allocate the loads with the highest priority for delivery during the day to the last trip of the shunting vehicles at night so that they would be the first to be delivered during the day.

A minimum number of 'lorrymates' will be used during the night shift. The loads will be secured by loading attendants stationed at ISCOR's Vanderbijlpark works. Loading attendants based at Airode will aid with the coupling and uncoupling of semi-trailers.

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* The loaded semi-trailer will be a load for distribution in the greater Vanderbijlpark area which has been shunted to Airode from Pretoria or from the ISCOR warehouse in Airode.

(ii) The Day Shift

One contracts controller will be employed during the day shift and he will be responsible for scheduling the 'bridging vehicles', the normal Alrode deliveries from the ISCOR warehouse as well as any loads bring shunted from Pretoria. As can be seen this operation is more complex than most and thus the very best contracts controller Cargo Carriers has should be used here.

It is recommended that a computerised scheduling model be developed using a database programme such as D VASE III to assist the contracts controller. The computer will be loaded with all the necessary data relating to the customers and would include the following :

- the number of loads available for a customer
- receiving capacity of customers (loads per day)
- receiving hours of customers
- offloading times at customers
- travel times to customers.

The load data could be punched in at night as the loads arrive at Alrode. The programme would then (during the day) generate a schedule for delivering the shunted loads indicating the frequency of despatch to a customer, i.e. what loads must be delivered next (according to a priority punched into the computer based on ISCOR's loading schedule). The programme could also be used to nominate parking bays at Alrode for empty and loaded semi-trailers.

As previously mentioned, 16 vehicles will be responsible for the distribution of steel from the ISCOR warehouse in Alrode. This operation will continue as before and does not necessarily have to be scheduled by computer.

(ii) The Day Shift (Continued)

For the bridging of loads shunted from Vanderbijlpark and Pretoria, 33 vehicles will be used. The loads will be delivered in order of priority with vehicles leaving in a staggered fashion so that 2 or more vehicles do not arrive simultaneously at one particular customer.

When the shift begins the drivers are each given a parking bay number, indicating where to find the loaded semi-trailer, as well as departure time. As discussed in the previous section the articulated vehicles which arrived last during the shunting operation will be the first to leave. The driver will stop at the exit of the depot, hand in the d. c that was attached to the vehicle and in return receive all the documentation pertaining to that load, the driver will then proceed with the delivery of the steel.

When the driver returns to the depot he hands the contracts controller the copy of the delivery note, signed by the customer and then will receive further instructions regarding which load to deliver next and at what time to proceed with the delivery.

At all times during both shifts load attendants will be responsible for the coupling and uncoupling of semi-trailers so there is no need for the driver to leave his vehicle to help with this.

6.3.3 The Pretoria Operation

Each of the 6 vehicles moving steel to Johannesburg and Vanderbijlpark via Alrode will pick up preloaded semi-trailers in the Pretoria depot, leaving behind an empty semi-trailer that will be preloaded by the 2 shunting vehicles in Pretoria while the other vehicles proceed with their trip to Alrode and return with an empty semi-trailer.

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5.4.3 The Pretoria Operation (Continued)

The empty semi-trailer is returned to Pretoria, which will be preloaded while the awaiting preloaded trailer is transported to Alrode.

Loads which have been staged at Alrode from Vanderbijlpark for Pretoria customers will be transported to Pretoria during the day shift. The returning prime mover will transport the (reloaded trailers at Pretoria to the Alrode depot. These loads will either be distributed during the day (as previously mentioned) to customer or would be transported during the evening shift as a return load to Vanderbijlpark for distribution to local customers in the Vanderbijlpark area the next day. The prime mover will deliver the semi-trailer to the Vanderbijlpark steel depot, unhitch it and collect an empty semi-trailer for loading at ISCOR's Vanderbijlpark works and then transport the loaded semi-trailer to Alrode for distribution during the next day.

It is clear from the above discussion that a large amount of interchangeability of the semi-trailers will occur thus it is important to have a large number of standard trailers which are capable of handling the different load types from Pretoria, Alrode and Vanderbijlpark without any problem. The skeletal trailers which are used for transporting coils from Vanderbijlpark, for example, would not be suitable for transporting from Pretoria. Flatbed trailers would seem the most appropriate to standardise with, however, they will not be able to carry the same payload as the skeletal trailers do. It is therefore necessary to have a 'good mix' of flatbed and skeletal trailers. The exact configuration can be determined from Table 5.5.

As far as the Pretoria direct delivery operation is concerned the status quo will remain intact.

The next chapter will discuss the economic feasibility of the establishment of a staging operations and a forecast will be made of the profit (or loss) that the operation will make. This will be compared with the present distribution system.

CHAPTER 6

6. FINANCIAL ANALYSIS

In this chapter an attempt will be made to construct profit and loss statements for each of the depots operating with the new distribution system. The objective here is to not only calculate the expected profit (or loss) for the entire steel distribution system but to forecast the various operating and administration expenses and the revenue generated by each depot.

A comparison will also be made between the existing and the forecast profit and loss statements.

6.1 Calculation of the Forecasted Profit

As mentioned above, this was achieved by constructing profit and loss statements for the Alrode, Vanderbijlpark and Pretoria depots. These profit and loss statements are essentially forecasts of the costs and revenues for each of these depots.

The profit and loss statements were prepared as follows :

* The basis for the entries in the profit and loss statements has been the 1988/89 budgeted values. These figures were determined by management and the auditors at Cargo Carriers and are adjusted for inflation.

* Items in the profit and loss statements which on their own contributed considerably to the overall income or expense of the depot were singled out and were forecast as accurately as possible in as much detail as possible. These items included salaries and wages, maintenance and repairs, fuel and tyres.

6.1 Calculation of the Forecasted Profit (Continued)

* The forecasted running costs (fuel), maintenance and repairs, oil and lubricants and tyres) were achieved by multiplying the cpk (cents per kilometre) values obtained from the budget with the forecasted number of kilometres *the fleet would achieve each month.* This kilometre value was based on the number of trips each vehicle would make per day, the average distance of each trip and the number of days the vehicle will work per month. This figure was then annualised. (Appendix H).

* In calculating the salary and wage cost of the operation, the staff complement at each depot was calculated based on the size of the fleet (especially as far as drivers, lorrymates and mechanics are concerned) and the size of the depot. Furthermore for each member of staff an estimate was made of how many hours per week that person will work both normaltime and overtime. The salary and wage bill was then calculated based on the 1988/89 budgeted salary and wage rates (per week or per month). For all the drivers and their assistants normaltime was calculated for a 46 hour week with 15 hours overtime at rate 1 and 5 hours at rate 2. (Appendix I). Furthermore a 250 work day year was assumed (Chapter 5) and all salary and wage *calculations were based on the Vanderbijlpark budgets as* they appeared to be the most reliable.

* All other smaller cost items in the profit or loss statement either remained constant (such as rent were scaled in proportion to the change in number of vehicles or employees at that particular depot. (In certain cases estimates have been calculated on average historical values, provided inflation has not affected these averages). In other areas such as non revenue earning vehicles, estimates have been made based on averages for fuel (cpk) and kilometres travelled.

6.1 Calculation of the Forecasted Profit (Continued)

* The 'depreciation vehicles' item has remained constant for both Pretoria and Vanderbijlpark as it is assumed that all vehicles that will be removed from these depots and either placed at Alrode or with other contracts, are fully depreciated. The depreciation of any new vehicles purchased has been included in the Alrode depreciation figure.

* The total revenue of the steel operation has been kept at the 1988/89 budgeted value. The staging operation will not provide an increase in revenue as there is a fixed volume of steel that has to be distributed, so whether it is distributed via a staging depot or directly, the revenue will remain constant. Revenue will, however, be reduced at others (Alrode) but the overall revenue for the entire steel operation will remain constant.

In calculating the revenue for the Alrode branch the 80 loads per day which will be bridged have been valued on an average 140 km trip at a revenue of R2,51 per kilometre. This revenue has been removed from the Vanderbijlpark figure (and added to the Alrode revenue).

For each load from Vanderbijlpark to Alrode 5 'dead' kilometres have been added to increase the running costs proportionally.

For the loads shunted from Pretoria to Alrode, 20 'dead' kilometres have been added for each load to the Alrode running costs and revenue equal to 20 km at R2,51 per kilometre has been taken from Pretoria and added to Alrode for each load.

The comprehensive profit and loss statements for Alrode, Pretoria and Vanderbijlpark are given in Appendix G. The profit and loss statements of the existing scenario are also given, along with a variance representing (in Rand terms) the difference between the 2 distribution systems.

6.1 Calculation of the Forecasted Profit (Continued)

A condensed profit and loss statement is given below (in Table 6.1) for purposes of summarising the findings.

It is clear from Table 6.1 that the introduction of a staging operation will have a noticeable improvement on the net income (after corporate administration fee) of the existing operation. The new operation will generate a net income of close to 20 percent higher than the existing operation. Allowing for a 15 percent annual growth in the company(equal to the prevailing inflation rate) the new operation still results in a 5 percent (in real terms) improvement on the existing steel distribution operation.

The return on turnover measure of performance indicates that the new operation operates at net profit of 19,6 percent compared to 21,1 percent with the existing operation. This represents a 7.1 percentage decrease in the profitability of the operation.

The operations expenses increased dramatically for the new operation (by 33 percent, not taking inflation into account) which illustrates that the distance the vehicles are travelling in total are increased substantially. This automatically leads to increases in the fuel, lubrication and maintenance and repairs bill for the new operation. The reduced profitability for this new operation can be attributed to this dramatic increase in operations expenses.

Table 6.1 *Condensed Profit and Loss Statement of the Present and Future Steel Operations - Annualised*

	PRESENT				FUTURE				
	VBP	PTA	ADE	TOTAL	VBP	PTA	ADE	TOTAL	% VAR
Transport Sales	22 476,4	4 554,2	2 582,9	29 563,4	15 364,4	4 154,2	18 517,3	38 035,9	28,7
Less Expenses :	14 831,4	3 390,3	2 065,5	20 287,2	9 275,0	3 159,2	14 193,4	26 667,6	31,5
Operations	14 085,5	3 106,8	1 868,3	19 060,8	8 556,7	2 915,7	13 712,6	25 285,0	32,7
Administration	745,7	283,5	197,2	1 226,4	618,3	273,5	480,6	1 382,4	12,7
Net Income (before CAF)	7 645,0	1 113,9	517,4	9 276,3	6 089,4	955,0	4 323,9	11 368,3	22,6
Corporate Admin Fee (CAF)	2 280,0	442,2	331,7	3 053,9	1 552,1	440,3	1 930,2	3 922,6	28,5
Net Income (After CAF)	5 365,0	671,7	185,7	6 222,4	4 537,3	514,7	2 393,7	7 445,7	19,7
Return on Turnover (%)	23,3	14,9	7,2	21.1	29,5	12,4	12,9	19,6	-7,1

NOTE : 1) VBP = Vanderbijlpark, PTA = Pretoria, ADE = Alrode, CAF = Corporate Administration Fee
VAR = Variance

2) In order to get the variance in real terms the prevailing inflation rate must be subtracted from it.

6.1 Calculation of the Forecasted Profit (Continued)

Although the establishment of the staging operation results in a reduced profitability, the benefits gained by developing a new top quality branch and creation of a dependancy of ISCOR on Cargo Carriers and the dramatically improved service which Cargo Carriers will offer ISCOR should fully justify the creation of a new depot and the introduction of a staging operation.

6.2 Staffing Requirements of the New Operation

The major changes to the structure of the present system is the change of staff in the organisation. The staff changes for each depot are discussed below, after which a table summarising the changes will be given.

For all the depots ratios of numbers of staff : vehicle were calculated. The new staff complement was thus obtained by proportionally increasing or reducing the staff with the increase or decrease of vehicles at that depot. Where necessary additional staff were added. (Appendix I).

6.2.1 The Vanderbijlpark Depot

The total Vanderbijlpark depot staff (for the ISCOR contract) will be reduced by 53 percent from 366 to 171, a reduction of 195 persons. Naturally the largest reduction in staff was for the drivers and their assistants who were reduced from a total of 270 to a total of 111. A major reduction was also made with the mechanics and their assistants who were reduced by a total of 14 persons (5 mechanics and 9 mechanics' assistants).

As far as the administration staff is concerned only 4 persons will be removed, one of which is an assistant branch manager. A detailed breakdown of the staff changes in this depot is given in Appendix J.

6.2.2 The Alrode Depot

As previously mentioned, the Alrode depot will operate on 2 shifts (day and night). The depot will employ a large night shift operation staff complement to cope with the 80 loads being shunted during this shift. The technical staff will be made available not only to the Alrode vehicles but any of Cargo Carriers' vehicles which happen to be in the vicinity and may need repair or service.

A total of 148 persons will work on the night shift, the bulk of whi will be drivers. No drivers assistants will accompany the drivers as resident teams operating at all three depots will perform all the necessary coupling and uncoupling of the vehicles as well as the fastening and covering of the load.

The current Alrode day shift will be increased by 73 persons who will be responsible for the bridging operation to the customers in the greater Alrode area. (Appendix J).

6.3.3 The Pretoria Depot

As with the Alrode depot, the Pretoria depot will also move to a double shift but only for the loads which have to be distributed to Johannesburg and Vanderbijlpark. The night shift will have a staff complement of 17 persons while the day shift will reduce its staff by 21 persons, resulting in a total reduction of 4 persons in the Pretoria depot. Appendix L gives a detailed breakdown of the staff complement of this depot.

Table 6.2 Summary of the staff Requirements for the New Steel Distribution Operation

	CURRENT	FUTURE	DIFFERENCE
Vanderbijlpark	366	171	-195
Alrode : Day Shift	166	239	73
: Night Shift	0	148	148
Pretoria : Day Shift	81	60	-21
: Night Shift	0	17	17
TOTAL	613	635	22

Source : See Appendix L

Table 6.2 illustrates that the new distribution system will create 22 more jobs. This will make it easier to sell the idea of this new operation to the trade union who generally believe that the introduction of a more efficient distribution operation leads to the retrenchment of staff.

CHAPTER 7

7. THE NEW ALRODE DEPOT

This chapter deals with the establishment of a new depot at Alrode. All aspects of the depot will be discussed ranging from parking facilities to the workshop facilities. A brief look at the existing depot will precede the discussion on the new depot.

7.1 The Existing Alberton Depot

This depot is currently responsible for the Wispeco, Namascor, Imperial Chemical Industries (ICI), Total and Shell Petroleum as well as the ISCOR steel contracts.

At present this depot houses 57 prime movers, 16 of which are used for the distribution of steel for ISCOR. Approximately 190 000 tons of steel are distributed annually from this depot which is situated about 5 kilometres from the ISCOR warehouse in Alrode. The Alrode depot at present has 166 members of staff in total (including drivers and their assistants).

This depot is not ideally suitable for the existing distribution operation and even less so for a fully fledged shunting operation. The reasons this are :

* The depot is very small and the facilities in this depot are cramped.

* There is no room for expansion whatsoever. New facilities, such as a spray painting bay, for example, cannot be built on the premises. The result is that the spray painting has to be done outside in the parking bay.

7.1 The Existing Alberton Depot (Continued)

* The entrance and exit to this depot is very small, making entrance and exit for articulated vehicles very difficult.

* The road in the depot is not tarred or paved, with the result that when it rains, vehicles sometimes get stuck.

* It cannot be used as a depot for a shunting operation. The depot is too small to handle the volume of traffic synonymous with a staging operation. There is also no room for the vehicles to park overnight.

* The depot is not situated in close proximity to the major customers of Cargo Carriers.

Due to the above reasons the management of Cargo Carriers decided to purchase a site in the Alrode area on which the new Alrode depot would be built. This new depot will house all the existing contracts and the new staging operation and will have enough space to allow for expansion in the future.

7.2 The New Depot

7.2.1 Siting the New Depot

The basic problem in siting a depot is to find the site or set of sites which lead to minimum costs. These costs include the costs of transporting goods in bulk to the depot, the cost of transporting these goods from the depot to the customers and the cost of operating the depot (23).

The problem of finding the best single site for a depot may be approached in several ways. Vurstall and Leaver (24) suggest using the 'centre of gravity' method, Elion and Doziel (25) suggest

7.2.1 Siting the New Depot

computer methods. However, these scientific approaches do not always give the optimal and most practical solutions.

The new Alrode depot was chosen on logical grounds after evaluating and comparing a few alternatives. The factors taken into consideration when choosing the new Alrode depot were, et al :

(i) Price

The property on which the new depot is to be built was offered to the Cargo Carriers management at a reasonable price, R37 per square metre, for the area it is situated in.

Although this price appeared to be reasonable to the management at Cargo Carriers, it is in fact the average price for land in this area.

(ii) Location of Existing and Potential Customers

The new Alrode depot is located in the heartland of the industrial area in greater Alberton. It is in close proximity to both ISCOR's and Cargo Carriers' biggest customers. Furthermore a large number of potential clients for Cargo Carriers are situated in the vicinity of the new Alrode depot.

This, along with the fact that there is ample room for future expansion makes the site of this shunting depot a good choice.

7.2.1 *Siting the New Depot*

(iii) *Access to the Depot*

The new depot is situated close tot he national highways thus allowing easy access to the depot from Vanderbijlpark and Pretoria as well as facilitating easy delivery to customers in the greater Johannesburg area. The access to the depot will be able to handle the volume of vehicles associated with a 24 hour operation without any problem.

(iv) *Present Property and Future Expansions*

The property in Alrode is approximately 38 000 square metres which is large enough for not only establishing a depot for the shunting operation but has ample room for any future expansion of the depot as well as establishing warehouses or any other buildings if necessary. At present only the North East section of this property will be utilised for establishing the new depot.

The size and shape of the new property on which the depot is to be built is given in figure 7.1.

7.3 *Layout of the New Depot*

The new depot occupies the north-eastern section of the property in Alrode only. The rest of the property will be used for a possible collection and delivery operation which would require warehouses and office blocks. (See Figure 7.1).

The entrance to the depot (1) is via Botha Street and is slightly skewed to allow the large articulated vehicles easy entry and exit to and from the depot.

7.3 Layout of the New Depot (Continued)

Immediately to the left of the entrance is the office block (2) which will house the administrative staff of the depot. Situated near the office block is the fuel bay (3) which is in line with the flow of traffic into the depot. In front of the fuel bay the workshop facilities (4) are found. To the left of the fuel bay the fleet parking (5) is found. Beyond the workshop the washbay (6) is situated with the ablution block (7) still further down, near the exit of the depot.

The depot is designed so as to allow easy and quick access, parking, refuelling and washing of vehicles. The layout is such that congestion, if any, will be kept to a minimum as there is enough space for the vehicles to move around in. This is not the case at the present Alberton depot. The layout of this depot is systematic in that all the facilities are in close proximity to each other and can be quickly accessed when required.

Figure 7.1 Layout of new depot

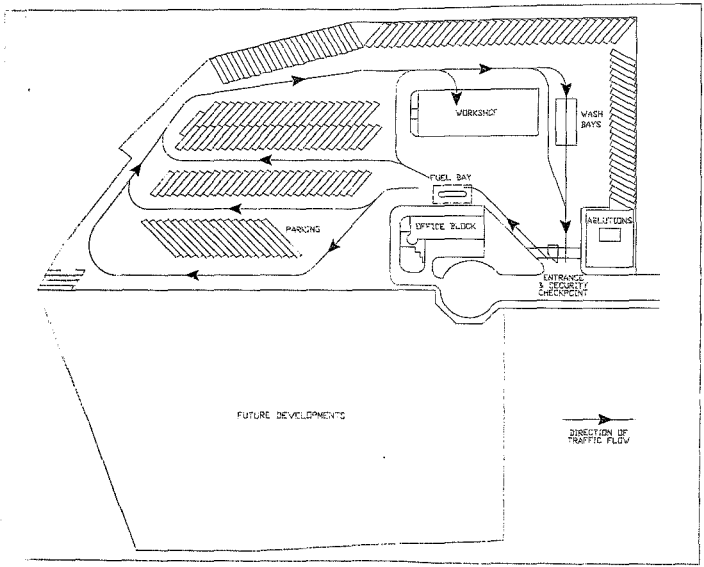
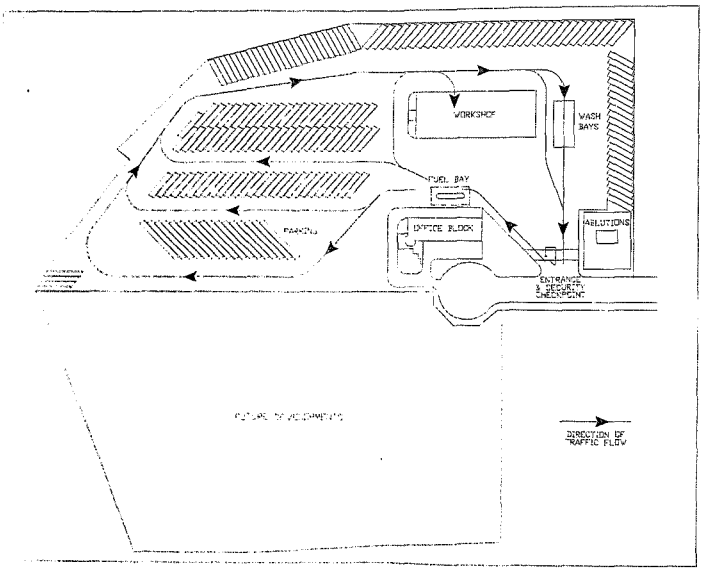


Figure 7.1 Layout of new depot



7.4 Facilities of the New Depot

The facilities which will be included in this depot will make it the flag ship of the Cargo Carriers group. The most up to date, state of the art technology will be used making it the most sophisticated in the group. The facilities that the depot has are discussed below.

7.4.1 Parking

The new depot provides parking for 3 categories of vehicles, viz. fleet parking, administration office parking and other staff parking. Each of these is discussed below.

(i) Fleet Parking

This is the parking for the semi-trailers with their payloads that have been shunted to Alrode from Vanderbijlpark and Pretoria and are awaiting distribution to the customers during the day shift. All the fleet parking is drive-through parking thus eliminating the need of reversing the articulated vehicle and thereby ensuring that the turn around time in the depot is as quick as possible.

Parking bays are also provided for articulated vehicles that run the last shunting haul and therefore do not need to uncouple the semi-trailer. The articulated vehicle is parked as a unit ready for delivery during the day shift.

Parking is also provided for the prime movers and semi-trailers which are in the process of being serviced at the workshop as well as for vehicles which belong to the other contracts (fuel, for example).

(i) Fleet Parking (Continued)

The entire fleet parking area is covered in cement slabs which provide a good support for the vehicles and semi-trailers with their loads.

(ii) Administration Office and Visitors Parking

Uncovered parking is provided for the Branch Manager, Assistant Branch Manager, Administration Manager, Workshop Manager as well as a few additional parking bays for other members of staff and visitors. If required these parking bays can later be converted into covered parking bays to provide protection for the more expensive staff vehicles.

(iii) Other Staff Parking

This parking is for all the workshop staff as well as the drivers, who need to leave their motor vehicles in a secured area. This is necessary, especially in the case of the night shift workers. Access to this parking is via the main security gate, thus enabling strict control over all persons entering and leaving the parking area.

Shade can be provided for these parking bays by either covering the parking (with corrugated iron roofing) or by planting trees which would provide the appropriate shade.

7.4.2 Lighting

Due to the large number of loads which are to be shunted during the night shift and the fact that the semi-trailers have to be uncoupled as quickly as possible in order to achieve a quick turnaround time, it is essential that the shunting depot has very good quality, high intensity lighting especially in the parking area. The lighting in the parking area is mast mounted, however, the lighting around the workshops and the administration area is mounted to existing structures.

At the base of each lighting mast in the parking area power points for three phase and 220 volt electricity as well as compressed air and water points are provided. This will enable repairs and cleaning of semi-trailers to be carried out where the semi-trailer is parked thus eliminating the need to move a loaded semi-trailer into the workshop.

7.4.3 Security

The entire depot is fenced off with only one entrance (as is the case with most of the depots in Cargo Carriers). The security office at the entrance is skewed in order to permit easy access to full length vehicles (the prime movers and the semi-trailers). The contracts controller is stationed with the security officer in a separate office. The security office is elevated so that papers, parking discs and instructions can be interchanged between drivers and the contracts controller quickly without either party having to leave their office or vehicle. (An extended roof provides cover against rain thus preventing the documents from getting wet).

The design of the depot entrance facilitates easy access and departure to and from the depot, incoming vehicles will not interfere with outgoing vehicles, thus ensuring a smooth traffic flow in and out of the depot.

7.4.4 Fuelling Bay

The new depot has a double lane fuelling facility which the vehicles would use to refuel either on their way in or on their way out. Space is provided for 2 vehicles to be refuelled simultaneously as well as allowing queuing space for 4 additional vehicles. If necessary tyres can be pumped and oil can be added at this fuelling bay.

7.4.5 Workshop

The workshop is situated in the south-east portion of the depot and is the flagship workshop of Cargo Carriers. The workshop has the following facilities :

- 5 repair bays - no pits
- 2 lubrication bays with lubrication pits
- 1 inspection/lubrication bay with lubrication pit
- 1 spray painting bay
- 1 fuel tanker repair bay
- 1 tyre changing bay
- 2 workshops
- Separate storage areas for spare parts, batteries, tyres, oils and lubrication and flammable products
- changing, shower and toilet facilities, mess facility and office accommodation.

The 5 workshop bays provide more than enough capacity for the servicing of the fleet. (The services are separated into 3 service cycles each of varying length, viz. M1 - monthly, M3 - 3 monthly, M6 - biannually with each vehicle having to undergo all three of these services. The lubrication bays are also sufficient and if necessary the one inspection bay can be used as a lubrication bay. These bays have pits for draining lubricants. (Appendix K)>

7.4.5 Workshop (Continued)

The spray painting bay has fire proof walls, fire protection and adequate ventilation for spray painting the prime movers and semi-trailers. A separate spray painting booth is necessary to cope with the large volume of spray painting that is done annually. Prime movers are spray painted once a year while semi-trailers are resprayed every six months. This works out to approximately 1 spray painting job per day. (Appendix K).

The fuel tanker repair bays are necessary to repair the fuel tankers that operate out of Airode. They cannot be repaired in the normal workshop as welding in the vicinity of fuel which is drained from the fuel tankers could be extremely dangerous. Both the fuel tanker repair bays are separated from the workshop by fire walls and have sumps to drain fuel to a waste fuel tank.

The double wash bays contain a cold water washing facility and an external steam cleaning facility. The 2 wash bays are separated by an elevated walkway which is used for washing the tops of the fuel tankers. These wash bays have multiple water and steam attachment points and adequate drainage facilities. An additional open washing apron outside the workshop can also be used for washing. The wash bay facility can be upgraded in the future to a full tanker cleaning bay for both external and internal washing.

On the first floor of the workshop office accommodation is proved for the workshop manager, the workshop foreman and for the workshop clerks. There are also mess, toilet, shower and changing facilities. In addition to this there is a separate ablution block for all the drivers and workshop staff.

7.5 Cost of the New Depot

A detailed cost breakdown of the construction and equipment costs of this depot is given in Table 7.1. The cost of the land is approximately R1 400 000 with construction and equipment costs at about R3 200 000 and R300 000 respectively. The cost of the architects, engineers and other professional persons is R180 000 bringing the total cost of the depot to R5 100 000 (including the cost of the land). The total project cost excluding the cost of land is approximately R3 700 000.

Although this depot will act as a base from which other (i.e. non ISCOR) contracts will operate, the total cost of constructing the depot has been costed to the steel contract only as the other contracts are a lot smaller than the ISCOR steel contract.

Table 7.1 The Cost of Establishing the New Alrode Depot

ITEM	SIZE (Square metres)	COST/UNIT Rand/Unit	TOTAL Rand
LAND	38 530	37	1 411 354
BUILDINGS :			
Office Block	400	500	200 000
Ablutions	350	500	175 000
Workshop	2 125	400	850 000
Workshop Offices	250	350	87 500
Security Office	45	550	24 750
Parking	33 175	35	1 161 125
Landscaping		10 000	10 000
Security Fencing		50 000	50 000
Electrical and Lighting		350 000	350 000
Staff Parking	1 570	25	39 250
Fuel Pump		10 000	10 000
Relocate Circle *		100 000	100 000
Other		200 000	200 000
TOTAL CONSTRUCTION COST			3 257 625
INSTALLATION COSTS :			
Office Furniture & Equipment			10 000
Telephones, Fax, Telex			15 000
Workshop Equipment			50 000
Airconditioning			80 000
Fire Protection			100 000
Other			51 021
TOTAL EQUIPMENT COST			306 021
PROFESSIONAL FEE			180 000
TOTAL PROJECT COST EXCLUDING PROPERTY			3 743 646
TOTAL PROJECT COST INCLUDING PROPERTY			5 155 000

NOTE : All figures are estimates based on discussions with the architects and engineers which have acted as consultants to the construction of this depot, as well as independent investigations.

* This is the cost of shifting the traffic circle backwards from its original position, See Figure 7.1.

Table 7.1 The Cost of Establishing the New Afrode Depot (Continued)

Based on 12 percent ROI on buildings and 20 percent* ROI of equipment the annual cost would be approximately R450 000. This is approximately 3 percent of the total cost of running the steel operation.

7.6 Implementation of the New Distribution Operation

The implementation of the staging operation should be undertaken in 3 phases, namely :

* The Construction Phase
* The 'Logistics' Phase
* The Industrial Relations Phase.

7.6.1 Construction Phase

During this phase the entire new depot is constructed and all the facilities must be installed. All items ranging from tooling in the workshop to furniture for the offices must be installed so that on completion of this phase the depot will be 100 percent ready for operation.

Strict control must be exercised during this phase in order to ensure that the budgets for the construction of this depot are not exceeded.

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* Reference 26.

7.6.2 Logistics Phase

This phase involves a logistical exercise to schedule the loading, parking, refuelling, and redistribution of the loads in order to ensure that all the desired results (such as turnaround times) are achieved. This exercise may go on for a few weeks, in fact the longer the better, so that when the system is ready for commissioning it will function as desired due to all the 'finetuning' it has received during the logistical exercise.

7.5.3 Industrial Relations Phase

This phase is of major importance as it deals with the people who either make-or-break the staging operation. During this phase negotiations are undertaken with the trade union regarding the introduction of 2 shifts, the moving and changing of staff to and from the various depots and any other possible consequences of this operation (such as safety) which might upset the workers and would thus lead them to reject the staging operation. It is essential that all industrial relations matters be settled long before the first vehicle rolls out of the new depot.

Any training of workers which has to be done must also be undertaken during this phase so that when the operation is commissioned it will run as smoothly as possible.

In the next chapter a summary of all the benefits of the introduction of this type of operation will be given along with recommendations for future work in this field.

CHAPTER 8

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Summary and Conclusions

It is evident that although the introduction of a staging operation does reduce the profitability of the steel operation by some 7 percent, (Table 8.1) the staging operation must be introduced and a new depot must be built to support this operation due tot he following benefits that could be derived from it :

(i) Improved service to ISCOR as more loads will be moved out of ISCOR's loading bays due to :

* The reduced number of vehicles loading at ISCOR during the day shift, resulting in less queuing at the weighbridge and less queuing and waiting at the loading bays.

* Cargo Carriers will be the only carrier loading during the night shift hence turnaround times in ISCOR will be very fast.

* Traffic on the main highway is very low at night hence no delay in the loads moved due to traffic congestion will occur.

(ii) Improved service will also be given to ISCOR's customers as the queuing at the customers sites will be reduced due to distances and times from Alrode being short, hence smoother and more controlled deliveries can be made.

8.1 Summary and Conclusions (Continued)

(iii) The operation of a double shift (operating on a 24 hour basis) will result in a major reduction of prime movers. 27 prime movers will be saved in this way and thus could be used in new or existing contracts thereby eliminating the need to buy new prime movers at a cost of approximately R250 000 each.

(iv) The shunting of loads to a central depot allows Cargo Carriers to become more flexible as it is possible to service the end user more swiftly and effectively from the new depot.

(v) By operating the fleet continuously, maximum utilisation and hence productivity of the fleet is achieved, however, this may not always be an advantage as the vehicles are placed under an intense strain which may eventually lead to a reduction in the life of the vehicle.

(vi) The number of overtime hours which will be worked will be reduced as operating 2 shifts with a shunting operation will allow all the loads to be moved within the allotted shift times.

(vii) The establishment of an infrastructure for this shunting operation will show ISCOR that Cargo Carriers is making a concerted effort to improve its level of service to ISCOR, at an additional cost to Cargo Carriers, and thus will stand a good chance of being re-awarded the steel contract when it expires in February 1992.

(viii) The establishment of this staging operation will create additional vacancies for 22 people hence making it easier to sell this idea to the trade unions, who are normally very suspicious of any attempt to improve efficiency and to provide better service as this normally leads to the retrenchment of workers.

8.1 Summary and Conclusions (Continued)

(ix) The purchase and development of the new property in Alrode will increase the asset base of the Cargo Carriers group and consequently increase the net asset value of Cargo Carriers shares.

(x) Another possible benefit could be derived from establishing the new depot in Alrode is the possibility of obtaining new business from the large industrial companies which are located near the new depot.

This dissertation clearly indicates that the proposed staging operation should be introduced as soon as possible, the only disadvantage being the 7 percent decrease in profitability. However, this is greatly outweighed by the abovementioned advantages, especially the fact that a better service will be provided to ISCOR by Cargo Carriers.

8.2 Recommendations for Future Work

In order to gain full benefit from the staging operation it is suggested that the following be investigated which will be of long term benefit to the success of the operation.

(i) At present Cargo Carriers has adopted a policy of centralised management. However, as the company grows it is becoming more and more difficult to control the operations, especially a large operation such as the proposed Alrode operation. It may be a good idea to begin investigating the adoption of a more decentralised policy which will give the depots greater autonomy and thus enable them to manage their depots in a more efficient manner.

8.2 Recommendations for Future Work (Continued)

(ii) The establishment of decentralised sales and marketing departments which will allow depots such as the new Alrode depot to try and bring in their own business without having to go through all the head office channels. This will enable the depots to grow independently and to eventually become major transport operators in their own right.

(iii) Decentralised marketing and incentives to allow full us of depot.

(iv) A considerable amount of work has to be done regarding the development of a formal vehicle replacement policy which will provide the various depots with new and properly selected vehicles at the correct time intervals thus eliminating the need for the depots to run old, underpowered and inefficient prime movers. A strategy should be adopted for the upgrading of vehicles in the steel fleet to the correct horsepower capacities. A minimum of 245 kilowatt vehicles should be used as they can handle the heavy steel load adequately.

As far as vehicle replacement is concerned, it is important to introduce new technology such as the interlink semi-trailer which can carry a bigger payload than the conventional trailers. Work should also be done to improve the design of the existing semi-trailers which tend to be unstable when very high steel coils are transported. Also improvement in the design of tarpaulins which will allow quicker covering and uncovering of the load and could contribute to improved efficiency of the staging operation, should be taken.

8.2 Recommendations for Future Work (Continued)

(v) The idea of some sort of real time feed back from the vehicles in this operation should also be investigated which will improve scheduling and reduce unnecessary queueing at the loading bays at both ISCOR and its customers. It might be a good idea to install 2-way radios to all the vehicles in the steel fleet. Transporters can also provide some sort of feedback for scheduling and control purposes. Although the introduction of the abovementioned items requires a considerable capital outlay, major operational savings could be achieved.

(vi) The introduction of computerised scheduling should be investigated as well. A computer model which will be able to schedule all vehicles at the depot, on the road or at ISCOR or its customers should be developed. This will contribute to more accurate scheduling and control of vehicles and thus enjoy some operational savings as delays due to congestion, breakdown and queueing will be minimised.

(vii) A positive mutually beneficial working relationship between Cargo Carriers and ISCOR's customers must be developed. An example of this would be for the customers to give the Cargo Carriers vehicles waiting at their offloading bays a higher priority than is presently being done*. Cargo Carriers in turn will make sure that all its loads are delivered on time.

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* The customers that only have one crane to load their own vehicles, feed their own machinery and to offload Cargo Carriers vehicles only after they have loaded their own vehicles and machinery. The result is that the Cargo Carriers vehicles spend excessive times queueing.

8.2 Recommendations for *Future Work* (Continued)

(vii) The customers should also be shown the benefits of installing more weighbridges and cranes as it is a shortage of these at the customers which causes excessive queueing and congestion.

APPENDIX A : A DESCRIPTION OF THE LOADING BAYS AT ISCOR's VANDERBIJLPARK WORKS

BAY	SOUTH WORKS	PRODUCT
1	Plate Mill	Plates
2	Combination Mill	Plates
3	Hot Mill	Plates
4	Hot Mill	Coils
5	Hot Mill	Sheets
6	Cold Mill	Coils
7	Cold Mill	Coils and Sheets
8	Cold Mill	Sheets
9	Cold Mill	Coils
10	Cold Mill	Coils
11	Cold Mill	Sheets
	NORTH WORKS	
12	Cold Mill	Coils and Sheets
13	Cold Mill	Coils
14	Cold Mill	Coils
15	Hot Mill	Coils and Sheets
16	Plate Processing Plant	Plates

NOTE : Plates are generally thicker than Sheets.

APPENDIX B : AGE ANALYSIS OF THE PRESENT CARGO CARRIERS FLEET

AGE (Yrs)	RIGIDS	RIGID TANKERS	TRUCK TRACTORS	TOTAL	% OF TOTAL	CUM %
19	0		2	2	0,2	-
18 - 19	0		2	2	0,2	-
17 - 18	0		4	4	0,5	-
16 - 17	0		1	1	0,1	-
15 - 16	0		3	3	0,4	-
14 - 15	2		3	5	0,6	-
13 - 14	2		9	11	1,4	-
12 - 13	0		1	1	0,1	-
11 - 12	13		8	21	2,6	-
10 - 11	0		14	14	1,7	92,2
9 - 10	1		72	73	9,1	92,0
8 - 9	3		44	47	5,0	82,9
7 - 8	16		88	104	13,0	77,1
6 - 7	11		158	169	21,0	64,1
5 - 6	4		33	37	4,6	43,1
4 - 5	18	1	91	110	13,7	38,5
3 - 4	34	1	25	60	7,5	24,8
2 - 3	0	0	31	31	3,9	17,3
1 - 2	1	8	36	45	5,6	13,4
0 - 1	1	0	62	63	7,8	7,8
TOTAL	106	10	687	803	100,0	

The above analysis reveals that 34 percent of the present fleet is 7 years old at the most. 82 percent of the fleet is not older than 10 years. According to Mercedes Benz, South Africa, the average economic life of their truck tractors is 8 years. Thus based on the above figures the Cargo Carriers fleet appears to be in good condition, however, the accuracy of these figures is questionable.

APPENDIX B : AGE ANALYSIS OF THE PRESENT CARGO CARRIERS FLEET (Continued)

These figures were obtained off the mainframe at Cargo Carriers. The accuracy of these figures is dependent on how accurate the input to the computer system is. It is fairly common occurrence for example, to replace a vehicle's engine (rejuvenate the vehicle) and then not to enter this change into the computer system. The result is that an inaccurate history of the vehicle is developed, leading to confusion regarding the vehicles age and its date of replacement.

APPENDIX C : COST OF INCREASING THE SIZE OF THE PRESENT STEEL FLEET

At present the steel fleet has 136 prime movers and 136 semi-trailers.

EXAMPLE :

To increase the capacity of the steel fleet by 20 percent or 25 percent either 164 or 170 vehicles will be needed thus 28 or 34 vehicles. The cost of these vehicles will be R7 000 000 or R8 500 000 at R250 000 each.

The table below summarises the above statement.

	PRIME MOVERS	SEMI-TRAILERS	TOTAL
Present Number	136	136	272
Increase by : 20%	164	164	328
: 25%	170	170	340
Actual Increase : 20%	28	28	56
: 25%	34	34	68
Cost per Unit	R 250 000	R 50 000	-
Cost of Increase : 20%	R 7 000 000	R 1 400 000	R 8 400 000
: 25%	R 8 500 000	R 1 700 000	R 10 200 000

APPENDIX D : THE COST OF ESTABLISHING THE NEW ALRODE DEPOT

ITEM	SIZE (Square metres)	COST/UNIT Rand/Unit	TOTAL Rand
LAND	38 530	37	1 411 354
BUILDINGS :			
Office Block	400	500	200 000
Ablutions	350	500	175 000
Workshop	2 125	400	850 000
Workshop Offices	260	350	87 500
Security Office	45	550	24 750
Parking	33 175	35	1 161 125
Landscaping		10 000	10 000
Security Fencing		50 000	50 000
Electrical and Lighting		350 000	350 000
Staff Parking	1 570	25	39 250
Fuel Pump		10 000	10 000
Relocate Circle *		100 000	100 000
Other		200 000	200 000
TOTAL CONSTRUCTION COST			3 257 625
INSTALLATION COSTS :			
Office Furniture & Equipment			10 000
Telephones, Fax, Telex			15 000
Workshop Equipment			50 000
Airconditioning			80 000
Fire Protection			100 000
Other			51 021
TOTAL EQUIPMENT COST			306 021
PROFESSIONAL FEE			180 000
TOTAL PROJECT COST EXCLUDING PROPERTY			3 743 646
TOTAL PROJECT COST INCLUDING PROPERTY			5 155 000

NOTE : All figures are estimates based on discussions with the architects and engineers which have acted as consultants to the construction of this depot, as well as independent investigations.

* This is the cost of shifting the traffic circle backwards from its original position, See Figure 7.1.

APPENDIX E : A PARETO ANALYSIS OF ISCOR's VANDERBIJLPARK WORKS' BIGGEST CUSTOMERS

The following analysis is for October 1987 :

SEQUENCE	CUSTOMER NAME	% >2%	SEQUENCE	CUSTOMER NAME	% <2%
1	TRANS ORIENT	15,3	1	ALNASUREK	1,7
2	PALEWINS	7,9	2	MINEX METAL	1,7
3	ABBEY TRADING	7,8	3	TRIDENT	1,6
4	DORBIJL	6,1	4	CROWN CORK	1,5
5	ERDELI OEMIR	5,4	5	S E M STAHL	1,5
6	METAL BOX	5,2	6	STEEL WORLD	1,5
7	BROLLO	4,0	7	FIRST STEEL	1,4
8	TRANS ASIA	3,8	8	HALL LONGMORE	1,4
9	ISCOOR	3,4	9	STRIP STEEL	1,3
10	G S E GENERAL	2,3	10	STORES SUPT.	1,2
11	VAN LEER	2,2	11	RHEEM	1,1
			12	FINDLAY DURHAM	1,1
		63,6			17,0

Total tonnage of steel for October 1987 = 277 059

Above 23 customers have 80,6% of the allocation given to 224 customers for the month.

APPENDIX F : A SUMMARY OF THE PRESENT STEEL DEPOTS

	VANDERBIJLPARK	PRETORIA	KLERKSDORP	TOTAL
Prime Movers	102	18	16	136
Semi-Trailers	135	20	16	171
Tons Moved	1 596 100	223 890	184 360	2 011 350
Number of Loads	59 220	8 880	8 083	76 183
Distance Covered (Km)	48 000 000	1 270 000	1 000 000	10 270 000
Average Payload	27	25,2	23	25,01
Percentage of ISCOR's Total Sales	64	14	22	100
Members of Staff	366	81	166	613

APPENDIX G : PROFIT AND LOSS STATEMENTS OF THE CURRENT AND FUTURE STEEL DISTRIBUTION OPERATIONS

($'000)

	CURRENT			FUTURE		
DESCRIPTION	VHD	PTA	ADE	ADE	PTA	VHD
TRANSPORT SALES	-22 476,4	4 504,2	-2 592,8	18 519,3	-4 154,2	15 364,4
Sub-Contractor Sales	-2 787,2	0,0	0,0	0,0	0,0	-1 765,4
Cost of Sub-Contractors	3 257,7	0,0	0,0	2,0	0,0	1 228,0
Office Equipment Expenses	0,0	1,2	0,0	3,0	1,2	1,0
Workshop Equipment Expenses	6,0	5,4	0,6	314,8	2,4	9,6
Depreciation - Vehicles	794,2	167,9	17,6	470,7	167,9	794,5
Depreciation - Workshops	0,3	8,6	2,4	14,9	8,8	5,4
Goods in Transit	77,7	12,9	9,6	68,1	12,8	35,1
Repair Costs Accidents	142,4	27,5	17,6	163,7	23,5	106,0
Third Party	142,4	23,5	17,6	163,7	23,5	106,0
Excess Claims	0,0	9,0	0,0	11,3	0,0	0,5
Fuel Vehicles	3 165,3	556,4	323,9	3 668,2	596,4	2 236,8
Fuel M-Bar Vehicles	59,1	16,5	9,7	59,0	16,5	26,1
Cost of Outside Loading	2,4	0,0	0,0	2,0	0,0	2,4
Load Securing and Protection Mat.	50,7	9,6	10,5	57,5	9,6	40,4
Lubes and Oils	149,9	23,3	23,0	187,0	22,3	116,5
M & R - Universal Parts	1 798,6	343,4	155,7	1 896,8	343,4	1 527,9
M & R - Unit Overhauls	1 026,4	138,5	134,1	0,0	138,5	0,7
Motor Carrier Certificates	30,1	5,9	1,2	11,3	5,6	19,7
Motor Vehicle Licences	263,0	88,2	39,5	268,9	74,1	141,0
Overalls	41,1	19,2	18,7	72,6	19,2	44,4
Tyres and Tubes - Escape	271,3	38,3	33,4	560,8	38,3	448,5
Tyres and Tubes - New	520,0	160,8	47,9	0,0	160,8	0,0
Tyre Write-Offs	67,3	0,0	0,0	0,0	0,0	89,3
Traffic Fines	7,2	1,2	0,6	5,0	1,2	5,9
Salaries and Wages	980,4	253,7	171,8	509,1	286,2	651,0
Night Out Allowances	297,1	95,9	49,6	370,0	42,5	206,4
Salaries and Wages Ops	1 325,7	715,2	442,5	3 421,5	822,6	1 780,5
Salaries and Wages Ops OT	1 438,6	334,5	312,1	1 134,8	239,1	679,8
Salaries and Wages Services Gr	107,2	25,1	20,6	106,4	26,2	71,9
Salaries and Wages Tyres	145,3	39,3	16,5	122,5	29,5	95,4
Salaries and Wages Tyres OT	33,6	6,7	2,7	26,1	14,1	20,6
OPERATIONAL EXPENSES	12 885,7	3 106,8	1 868,3	13 712,8	2 915,7	8 656,7
Advertising	3,6	1,2	0,5	3,2	1,2	2,9
Assessment Rates	0,0	0,0	0,0	0,0	0,0	0,0
Ex- Air Charter Expenses	0,0	0,0	0,0	0,0	0,0	0,0
Depreciation - Passenger Vehicles	43,2	17,4	18,1	0,0	17,4	46,6
Depreciation - Office Furniture and Equipment	0,0	1,0	0,0	0,0	1,0	0,2
Donations	0,0	0,0	0,0	0,0	0,0	0,0
General Expenses	3,6	1,2	0,5	2,4	1,2	4,3
M & R - Furniture and Equipment	18,0	4,8	4,8	10,0	4,8	19,5
M & R - Property	24,0	6,0	4,4	0,0	6,0	28,2
M & R - Passenger Vehicles	8,8	0,0	0,0	10,0	0,0	0,0
Pubs and Subs	0,0	0,0	0,0	0,0	0,0	0,0
Printing and Stationery	18,0	7,9	6,0	11,9	7,9	21,6
Rents Paid - External	86,4	43,2	31,1	0,0	43,2	83,0
Salaries and Wages - Admin	388,6	88,9	77,5	214,2	88,9	220,4
Salaries and Wages - Depot Service	27,7	24,0	15,8	44,7	24,0	44,2
Salaries and Wages - Depot Serv. OT	12,9	4,4	3,7	15,1	4,4	12,5
Salaries and Wages - Admin OT	58,9	3,7	3,1	22,7	7,1	30,9
Security Cash	7,2	4,2	4,2	7,5	4,2	3,0
Security Pensions	60,4	34,2	0,0	0,0	34,2	68,4
Travel and Entertainment	31,4	10,0	6,0	17,4	10,0	25,0
Telephones and Postages	19,2	10,2	8,8	23,9	14,2	14,3
Water and Lights	7,2	9,6	6,7	97,6	9,6	6,0
Tees and Cleaning	5,0	6,6	3,0	10,9	6,6	8,0
TOTAL ADMINISTRATION EXPENSES	745,7	283,5	197,2	680,6	273,9	618,3
NET INCOME BEFORE CORPORATE ADMIN FEE	-9 546,0	-1 113,7	-519,4	4 323,9	-955,0	6 089,4
NET ON TURNOVER BEFORE CORP ADMIN FEE	34,0	24,7	20,0	23,4	23,0	39,6
CORPORATE ADMIN FEE	1 820,0	442,2	331,7	1 930,2	419,3	1 352,1
NET INCOME	-5 365,0	-971,7	-385,7	-2 393,7	-814,6	-4 537,3
RTURN ON TURNOVER	23,9	14,9	7,2	12,9	19,4	29,5

APPENDIX H : SAMPLE CALCULATION OF FLEET REQUIREMENT FOR THE STAGING OPERATION

(i) Vanderbijlpark

For the Vanderbijlpark to Johannesburg journey :

Total distance travelled	= 140 km
Average speed	= 60 km/h
Loading time	= 30 min
Uncoupling time	= 30 min
Duration of journey = 140/60	= 2,33 hrs
Total time for one trip	= 3,33 hrs

i.e. 3 trips per shift will be managed from Vanderbijlpark to Airode (or the greater Johannesburg area).

Trips : 3 x 3,33	= 10,0 hrs
Lunch break 1 x 30 min	= 0,5 hrs
Tea break 2 x 15 min	= 0,5 hrs
	= 11,0 hrs

As can be seen from the above calculation, 3 trips can be managed quite comfortably within a 12 hour shift.

Annual tonnage	1 059 000 tons
Average payload	27 tons
No of working days	250 per annum
This represents	4 236 tons per day
Thus there are 4 236/27 =	157 loads per day

APPENDIX H : SAMPLE CALCULATION OF FLEET REQUIREMENT FOR THE STAGING OPERATION *(Continued)*

(i) Vanderbijlpark

The load split based on analysis of queueing, offloading and delivery times to the customers is as follows :

Johannesburg	80
Vanderbijlpark	77
	157

Thus 80 loads have to be delivered to Johannesburg daily, so we have :

No of loads = 80
Trips per vehicle per shift = 3
This represents 80/3 = 27 *vehicles plus one spare vehicle*, thus giving a grand total of 28 vehicles required.

Similar calculations can be done for the Pretoria and Alrode depots which will the figures in Table 5.5.

(ii) Savings achieved with the establishment of the Staging Operation

Table 5.5 illustrates that 27 prime movers will be saved while 22 semi-trailers have to be purchased by establishing the staging operation.

(ii) Savings achieved with the establishment of the Staging Operation (Continued)

The savings in Rand terms are calculated as follows :

	PRIME MOVERS	SEMI-TRAILERS
Number saved	27	-22
Cost per unit (Rand)	250 000	50 000
Saving or (Expense)	6 750 000	(1 100 000)
NET SAVING	R5 650 000	

NOTE : All figures given are for 1988

The above saving of R5 650 000 is based on the purchase price of a new vehicle (R250 000 per unit) and the purchase price of a new semi-trailer (R50 000 per unit).

APPENDIX I : SAMPLE CALCULATIONS OF *STAFF REQUIREMENTS* FOR THE STAGING OPERATION

The following calculation is for the number of mechanics required for the Alrode depot for both shifts :

Current number of vehicles	=	51 (for all contracts)
Current number of mechanics	=	5
Ratio *mechanics : vehicles*	=	1:6,8 (based on VBP ratio)
Future number of vehicles	=	91 (for all contracts)
Day shift : vehicles	=	64
Night shift : vehicles	=	27
Mechanics : day shift	=	9
Mechanics : night shift	=	4
Total number of mechanics	=	13

i.e. 9 mechanics are required for the day shift and 4 for the night shift.

The wage bill of the mechanics is estimated as follows :

Normal rate	R	12,36 per hour
Normal time hours		46 per week
Overtime at rate 1 (i.e. time and a third)		5 hours
Other costs (pension, medical aid and insurance)	R	147,95
Cost per week normal time = 12,36 x 46	R	568,56
Cost per week overtime = 12,36 x 5 x 1,33	R	82,20
Total cost per week	R	798,71
Total cost per month (4,2 week p m)	R	3 355,00

The above calculations were conducted for all the members of staff. The final figures are given in Appendices J and L.

APPENDIX 2 : SUMMARY OF STAFFING REQUIREMENTS

DESIGNATIONS	TOR FUTURE	TOR DUP CURRENT	TOR DIFF	ALGOOC 1987	ALGOOC 1988/9	ALGOOC FUTURE	ALGOOC CURRENT	ALGOOC DIFF	PTS 1987	PTS 1988/9	PTS FUTURE	PTS CURRENT	PTS DIFF	TOTAL FUTURE	TOTAL CURRENT	TOTAL CHANGE
CHAPTER 1 MAKE DEPARTURE																
District Controller	4	5	-1	4	2	4	3	2	2	0	2	2	0	12	10	2
Operations Supervisor	6	9	-3	6	3	6	5	3	2	1	3	2	1	17	16	1
Air Ops Inspector	1	1	0	1	0	1	0	1	0	0	0	0	0	3	1	2
Area Checker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trainer	35	133	-78	94	75	169	81	88	15	9	24	21	3	268	257	11
Trainer Assistants	100	181	-81	66	50	93	23	70	15	4	19	26	-7	217	248	-29
Turnaround Supervisors	1	1	0	2	0	2	1	1	0	0	0	0	0	3	2	1
Loading/Unloading Gen Workers	0	0	0	0	88	22	0	22	0	0	0	0	0	22	0	22
TOTAL	148	351	-203	193	178	306	125	156	34	14	48	53	-5	544	533	11
CHAPTER 2 MAKE DEPARTURE TOW SERVICE																
Tow Controller	3	3	0	1	0	1	0	1	0	0	0	0	0	2	1	1
Tow Clerk	2	5	0	1	0	1	1	0	2	0	2	1	1	3	2	1
Tow Attendants	4	15	-7	4	4	10	3	7	4	3	6	4	2	21	22	-1
TOTAL	9	14	-7	2	4	12	4	8	1	2	7	5	2	26	25	1
CHAPTER 3 MAKE SERVICE - AC																
Workshop Manager	1	2	-1	1	0	1	1	0	1	0	1	1	0	3	4	-1
Workshop Foreman	2	0	+2	1	0	1	1	0	1	0	0	0	0	3	1	+2
Storeman	1	1	0	1	0	1	1	0	1	0	1	0	1	3	1	2
Fuel Bowser Driver	1	2	-1	2	1	3	1	2	0	0	0	0	0	3	3	0
Mechanics	15	15	0	5	4	11	5	6	3	3	3	4	-1	26	24	2
Mechanic Assistants	13	21	-8	11	6	17	7	10	3	2	3	5	-2	26	35	-9
Avn Electricians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass. Services/Tyres Fitters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleaners	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Testers/Tyre Fitters/ Welder Assistants	1	1	0	1	0	1	0	1	0	1	1	1	0	2	3	-1
Welders Attendants	1	1	0	1	0	1	1	0	1	0	1	1	0	3	3	0
Fitters Attendants	3	3	0	3	3	6	2	4	1	1	3	2	1	12	17	-5
TOTAL	38	52	-14	33	15	48	23	25	14	1	15	14	+1	96	91	5
CHAPTER 3 WORKS																
Branch Manager	1	1	0	1	0	1	1	0	1	0	1	1	0	3	3	0
Assistant Branch Manager	0	1	-1	1	0	1	0	1	0	0	0	0	0	1	1	-1
Administration/Liaison Officers/Training Officers and Drivers	1	1	0	1	0	1	0	1	0	0	0	0	0	1	1	1
Duty Fitter	1	2	-1	1	0	1	1	0	2	0	2	2	0	4	5	-1
Duty Clerk	1	1	0	1	0	1	1	0	0	0	0	0	0	2	2	0
Forklift Driver	1	1	0	1	0	1	0	1	0	0	0	0	0	2	1	1
Cycle Fitter	1	3	-2	1	0	1	0	1	0	0	0	0	0	2	3	-1
TOTAL	5	9	-4	6	0	6	2	4	3	0	3	3	0	15	15	0
CHAPTER 3 WORKS - DEPOT SERVICE																
Security Guards	0	0	0	2	0	2	0	2	0	0	0	0	0	2	0	2
Fire Attendant	0	0	0	1	0	1	0	1	2	0	2	2	0	3	2	1
Messengers	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0
Cleaners	1	3	0	1	0	1	0	1	1	0	1	1	0	2	4	-2
TOTAL	1	3	0	4	1	4	0	4	4	0	4	4	0	12	15	3
GRAND TOTAL	201	431	-230	238	198	376	154	196	56	17	77	81	-4	693	679	14

APPENDIX K : SAMPLE CALCULATION OF WORKING FACILITIES AT THE NEW DEPOT

The following sample calculation is for the number of repair bays required in the new workshop.

Total no of vehicles for servicing (for all contracts)			91
Service cycles	M1	= 1 day (max)	6 weekly
	M3	= 2 days (max)	2 monthly
	M6	= 6 days (max)	6 monthly

If vehicles have to be serviced every 6 weeks this is equivalent to 15 vehicles per week. 2 shift for maintenance = 7,5 vehicles per shift thus 7,5 repair bays are required per shift for maintenance. However, the M1 service very seldom takes as long as one shift. According to the mechanics at Alrode, the M1 service normally takes 1/2 a shift thus 4 bays are required for maintenance.

The new depot will be built with 5 bays for maintenance which will adequately cope with maximum demand.

The calculation for all the other workshop facilities follow the same principle as above.

APPENDIX I : SALARY AND WAGE BILL CALCULATIONS

NO	DESIGNATIONS	NORM RATE	NORM HRS PER WEEK	OVERTIME RATE 1 (1.33)	OVERTIME RATE 2 (1.5)	OVERTIME RATE 3 (2.0)	OTHER COSTS PER WEEK	COST PER WEEK £P	NORM COST PER WEEK	COST PER MONTH	MONTH BASIC SALARY	TOTAL BONUS	TOTAL OVERTIME
	SALARIES & WAGES OPERATIONS												
6	Contract Controller	13.76	46	5.0			158.71	66.16	744.68	3226.22	3041.20	336829.20	25913.28
8	Operations Supervisors	6.82	46	15.0	5.0		70.00	132.26	313.54	1358.56		162302.55	54054.28
1	Client Inspector	4.78	46	15.0	5.0		24.00	121.12	219.88	1064.02		12829.87	4714.45
2	Chain Checker	4.78	46	15.0	5.0		25.00	64.56	439.76	951.36		51293.15	6798.78
189	Cleaners	4.78	46	15.0	5.0		90.00	116.82	381.78	1745.27		3541209.49	3726677.13
56	Drivers Gas' trade	5.20	46	15.0	5.0		25.00	84.51	145.00	944.32		705120.00	738730.27
2	Tugmaids - see	5.35	46	15.0	5.0		20.00	64.54	149.10	946.36		52286.47	6706.79
22	Seafood : - e Gen												
	Workers	7.25	46	15.0	5.0		30.00	64.54	149.10	946.36		1482223.43	73796.16
308	TOTAL	4.56							295.85	12984.00		2823192.00	3526892.00
	SALARIES & WAGES OPERATIONS TYPE SERVICE												
1	Tyre Controller	10.11	46	4.1			121.85	64.12	594.20	2618.28	2068.00	26481.76	2357.43
1	Tyre Clerk	3.81	46	5.5			46.00	72.58	267.52	998.01		12798.24	1178.72
10	Tyre Attendants	3.35	46	9.2	3.0		46.00	61.42	154.10	955.20		8172.00	21536.42
12	TOTAL	5.21		3.5	0.6		217.00	179.00	950.00	4572.00		124455.00	25087.77
	SALARIES & WAGES SERVICE												
1	Workshop Manager	19.10	46				228.56	0.00	1387.41	4796.11	3896.00	52558.11	0.00
2	Workshop Foreman	13.34	46	5.0			110.72	69.94	771.57	2732.00	2560.00	49451.16	5229.94
1	Fireman	12.36	46				147.95	0.00	734.72	2401.14	2464.00	37281.25	0.00
3	Slurry Mixer	3.35	46	5.5	2.0		45.00	75.32	153.10	955.45		23857.62	4025.77
15	Mechanic(s)	10.36	46	5.0			147.35	69.26	746.37	2458.61	2464.00	454028.78	32580.56
19	Mechanic(s) Assistant(s)	3.15	46	8.0	2.0		45.00	75.80	153.10	771.15	1347262.80	25481.36	0.00
	Auto Electrician(s)		46	5.0	2.0		0.00	0.00	0.00	0.00		0.00	0.00
	Fuel Pension(s)/Slurry Painter(s)		46	8.0	2.0		0.00	0.00	0.00	0.00		0.00	0.00
	Welder(s)		46	8.0	2.0		0.00	0.00	0.00	0.00		0.00	0.00
1	Fuel Painter/Slurry Painters/Welders Assistant(s)	3.35	46	8.0	2.0		45.00	75.80	153.10	771.15		7301.26	1511.70
4	Diesel Mechanic(s)	3.35	46	8.0	2.0		45.00	75.80	153.10	771.15		13952.00	3023.41
									153.10	771.15		47787.70	8055.54
49	TOTAL	7.46							4579.43	18963.41		706197.66	706382.90

NO	DESIGNATIONS	NORM RATE	NORM HRS PER WEEK	OVERTIME RATE 1 (1.33)	OVERTIME RATE 2 (1.5)	OVERTIME RATE 3 (2.0)	OTHER COSTS PER WEEK	COST PER WEEK £P	NORM COST PER WEEK	COST PER MONTH	MONTH BASIC SALARY	TOTAL BONUS	TOTAL OVERTIME
	SALARIES & WAGES												
1	Branch Manager	29.44	46				293.96	0.00	1354.85	6134.37	4872.00	73674.24	0.00
1	Assistant Branch Manager	17.00	46				186.13	0.00	814.28	3525.85	3850.00	43303.72	0.00
1	Admin Controller	11.28	46				126.11	0.00	484.57	2455.34	2398.00	34397.13	0.00
1	Admin Clerks (Creditor and Debtor)	7.82	46				84.36	0.00	402.14	1702.02	1438.00	21371.16	0.00
1	Wage Clerk	6.60	46				69.93	.00	339.14	1383.30	1083.00	18285.68	0.00
1	Receptionist	5.66	46				64.51	0.0	253.14	1207.32	1008.00	18285.68	0.00
4	Admin Clerks	5.47	46	13.5	5.0	0.00	64.30	107.2	225.61	1471.53		73719.92	22715.05
10	TOTAL	10.67					893.30		4102.10	19882.93		241985.69	22715.05
	SALARIES & WAGES - DEPOT SERVICE												
2	Security Guards		46	0.0			0.00	0.00	0.00	0.00		0.00	0.00
3	Tea Attendants	3.35	46	13.5	2.5		35.00	68.51	143.10	829.66		22233.00	7566.99
Messenger		3.35	46	13.5	2.5		35.00	68.51	143.10	829.66		0.00	0.00
1	Cleaners	3.35	46	13.5	2.5		35.00	68.51	143.10	829.66		22233.00	7566.99
9	TOTAL	3.35							429.30	2488.97		44467.00	15133.00
387	GRAND TOTALS											5410377.00	4703377.00

APPENDIX I : SALARY AND WAGE BILL CALCULATIONS

NO	DESIGNATIONS	NORM RATE	NORM HRS PER WEEK	OVERTIME RATE 1 (1.33)	OVERTIME RATE 2 (1.5)	OVERTIME RATE 3 (2.0)	OTHER COSTS PER WEEK	COST PER WEEK OT	WORK COST PER WEEK	COST PER MONTH	AVERAGE GROSS SALARY	TOTAL MONTHLY	TOTAL INCENTIVE
	SALARIES & WAGES OPERATIONS												
6	Contract Controller	11.36	40	5.0			158.71	88.18	246.88	2774.22	2641.20	32068.39	37562.26
8	Operations Secretary	6.82	40	15.0	5.0		35.00	132.30	266.91	1200.56		14406.72	16994.28
1	Client Inspector	6.36	40	15.0	5.0		20.00	127.32	201.32	1809.12		21709.44	4274.69
3	Chain Checker	5.35	40	15.0	5.0		20.00	64.31	147.10	793.20		15240.00	6798.75
189	Drivers	5.76	40	15.0	5.0		90.00	108.83	289.71	1562.27		1812300.48	1126677.43
98	Drivers Assistants	5.20	40	15.0	5.0		20.00	67.31	147.10	793.20		7093.20	3497.92
2	Turnstile Repairers	5.35	40	15.0	5.0		20.00	64.31	149.10	804.28		15296.00	6360.78
29	Loading/Unloading Gen Workers	5.35	40	15.0	5.0		20.00	64.31	147.10	793.20		166292.40	72196.58
308	TOTAL	5.51							209.95	13484.00		2081227.63	1312465.60
	SALARIES & WAGES OPERATIONS FUEL STATION												
1	Tyre Controller	11.11	40	4.0			121.95	44.37	586.28	2816.16	2816.00	33660.70	3327.47
1	Tyre Clerk	5.55	40	5.0			60.00	33.08	293.62	936.36		11236.32	1239.30
10	Tyre Attendants	5.55	40	5.0	2.5		60.00	41.42	156.10	670.30		41132.00	20338.42
12	TOTAL	5.51			2.5	0.0	317.00	129.00	950.00	4672.29		126455.00	20267.77
	SALARIES & WAGES SERVICE												
1	Workshop Manager	15.40	40				220.66	0.00	1101.43	4797.16	3898.00	57586.11	0.00
2	Workshop Foreman	13.14	40	5.0			150.72	88.74	771.57	3343.80	3860.00	80451.12	9029.95
1	Storeman	10	40				147.76	0.00	736.57	3193.14	3464.00	37583.68	0.00
3	Stores Issuer	5.14	40	5.0	2.0		60.00	39.80	153.18	774.65		23883.62	4023.27
11	Mechanic(s)	10.36	40	5.0			141.95	69.20	714.32	3455.05	3454.00	38005.28	30938.96
19	Mechanic(s) Assistant(s)	7.35	40	6.0	2.0		45.00	75.60	152.16	774.65	1519.62.80	75497.36	0.00
1	Auto Electrician(s)		40	6.0	2.0		0.00	0.00	0.00	0.00		0.00	0.00
	Panel Beater(s)/Spray Painter(s)		40	6.0	2.0		0.00	0.00	0.00	0.00		0.00	0.00
	Welder(s)		40	6.0	2.0		0.00	0.00	0.00	0.00		0.00	0.00
1	Fuel Injector/Spray Painter/Welders Assistant(s)	7.35	40	6.0	2.5		45.00	73.90				7931.20	1241.78
2	Battery Attendant(s)	7.35	40	6.0	2.0		45.00	75.60				15872.00	2483.51
4	Diesel Attendants(s)	7.35	40	6.0	2.0		45.00	75.60		.65		47787.20	8478.54
45	TOTAL	7.56							4874.43	18952.43		386197.00	865282.00

NO	DESIGNATIONS	NORM RATE	NORM HRS PER WEEK	OVERTIME RATE 1 (1.33)	OVERTIME RATE 2 (1.5)	OVERTIME RATE 3 (2.0)	OTHER COSTS PER WEEK	COST PER WEEK OT	WORK COST PER WEEK	COST PER MONTH	AVERAGE BASIC SALARY	TOTAL MONTHLY	TOTAL INCENTIVE
	SALARIES & WAGES												
1	Branch Manager	24.44	40				293.56	0.00	1416.48	6134.47	4815.00	73676.24	0.00
1	Assistant Branch Manager	17.00					168.11	0.00	814.28	3528.23	3866.00	43233.72	0.00
1	Admin Controller	11.38					136.16	0.00	550.57	2385.14	2382.00	34197.61	0.00
1	Admin Clerks (Creditor and Debtor)	7.02					84.24	0.00	402.14	1742.19	1452.00	21171.36	0.00
1	Wage Clerk	5.68	4				20.53	0.00	351.14	1520.32	1520.00	18241.28	0.00
1	Receptionist	5.06	40				60.51	0.00	301.14	1304.32	1085.00	15201.28	0.00
4	Admin Clerks	5.42	40	13.1	5.0	0.00	60.32	109.71	271.01	1464.52		43810.32	22716.25
10	TOTAL	10.67					858.30	380.21	4110.10	17800.20		349385.00	22716.25
	SALARIES & WAGES - SECURITY SERVICE												
2	Security Guards		40	0.0			0.00	0.00	0.00	0.00		0.00	0.00
3	Tea Attendants	5.35	40	13.1	2.5		35.00	49.31	170.10	729.66		23332.00	7582.48
	Messenger	5.35	40	13.1	2.5		35.00	49.31	170.10	729.66		0.00	0.00
3	Drivers	5.35	40	13.1	2.5		35.00	49.31	170.10	729.66		23332.00	7582.48
9	TOTAL	5.35							677.30	2909.37		46647.00	15164.96
387	GRAND TOTALS											3443937.06	1792533.00

REFERENCES

1. MARCUS, R.D. Distribution in South Africa, - Quo Vadis, Proceedings of the Ninth SAPICS Conference, Durban 1988.

2. MAGEE, JOHN F. Industrial Logistics; Analysis and Management of Physical Supply and Distribution Systems McGraw., 1968.

3. TAFF, C.A. Management of Physical Distribution and Transportation Ged. Irwin, 1978.

4. LAMBERT, D.M., STOCK J.E., Strategic Physical Distribution Management. Prentice Hall 1977

5. VOLLMAN, T.E., BERRY, W.L., WHYBARK, D.C. Manufacturing Planning and Control Systems, Illinois : Dow Jones, Irwin Publishing Company, 1984.

6. ALLYOTT, J.H. Physical Distribution in *Industrial and Consumer Marketing*. McGraw Hill 1980

7. ACKERMANN, K.B. Warehousing - a guide to both users and operators, New York : McGraw Hill.

8. COOKE, P.N.C., Financial Analysis of Motor Transport Operations, Exxes : Gower Press Ltd, 1974.

9. KLOSS, L.K. You, your future and the future of Physical Distribution Management, London. *Chapman* 1980

10. COYLE, J.J., BARDI, E.J. The Management of Business Logistics, Minnesota : West Publishing Company, 1980.

11. BARTLETT, M.C., Readings in Physical Distribution, Illinois : The Interstate Printers and Publishers, 1972.

12. Annual *Report* for 1987 of The South African Iron and Steel Industrial Corporation (ISCOR), Pretoria 1987.

13. DUNCAN, M. Road Transport Industry : Never Letting Go, Financial Mail. January 16, 1988, pp 30-31.

REFERENCES (Continued)

14. ECMT, Transport is for People, *Proceedings of the Ninth International Symposium on Theory and Practice in Transport Economics*, Madrid, 1982.

15. HAMILTON, C.C. Transport Statistics, CSIR Special Report Pad 58, pp 1-66 Pretoria, 17th Ed., 1986.

16. Transport Costs : Boost for Railways, Financial Mail August 26, 1988, pp 81.

17. Trucks and Transport : A Survey *Supplement to* Financial Mail, August 26, 1988.

18. BRAUN, M. BYERS, I. Road Transportation in SA : What *is the* Future?, *Max Braun and Associates*, Johannesburg 1986.

19. South Africa (Republic) Acts, The Road Transportation Act 74, 1977.

20. Transvaal (Province) Ordinances, The *Road Traffic* Ordinance, 21, 1966.

21. South Africa (Republic), Parliament White Paper N 1986.

22. HAMILTON, C.C. *The Estimated* Market Share of Public and Ancilliary Road Carriers in a Specifically Defined South African Goods Transport Market, *National Institute for* Transport and Road Research, technical report RT/49 CSIR, Pretoria, 1986.

23. SUSSAMS, J.E. Efficient Road Transport *Scheduling*, *London : Gower Press* Ed, 1971.

24. BURSTALL, L.M., LEAVER, R.A. SUSSAMS, J.E. Evaluation of Transport Costs for *Alternative* Factory Sites - a Case Study : Operational Research Quarterly 13, 334.

25. EILON, S., DEZIEL, D.P. *Siting a Distribution Centre* : Management *Science* 12, 245, 1966.

BIBLIOGRAPHY

BUTTON, K.J., Transport Economics, 1sted, London : Heineman Education Books Ltd, 1982.

BIGGS, G.W., Road Haulage Management, London : Butterworth and Co, 1963.

CONSTANTIN, J.A., Principles of Logistics Management, A Functional Analysis of Physical Distribution Systems, New York : Merdedith Publishing Company, 1966.

DAVIS, G.M., FARRIS M.T. HOLDER, J.J. Management of Transporation Carriers, New York : Praeger Publishers, 1975.

FLOOR, B.C. Transport - Some Future Prospects Unit for Further Research, University of Stellenbosch, June 1981.

FOSTER, C.D., The Transport Problem, 2nd REvised ed, London : Croom Helm Ltd, 1975.

GATTORNA, J. Ed Handbook of Physical Distribution Management, 3rd Ed, London : Gower Publishing Company Limited, 1983.

HURTER, A.P., OI, W.Y. Economics of Private Truck Transportation, London : W.M.C. Brown Company Publishers, 1965.

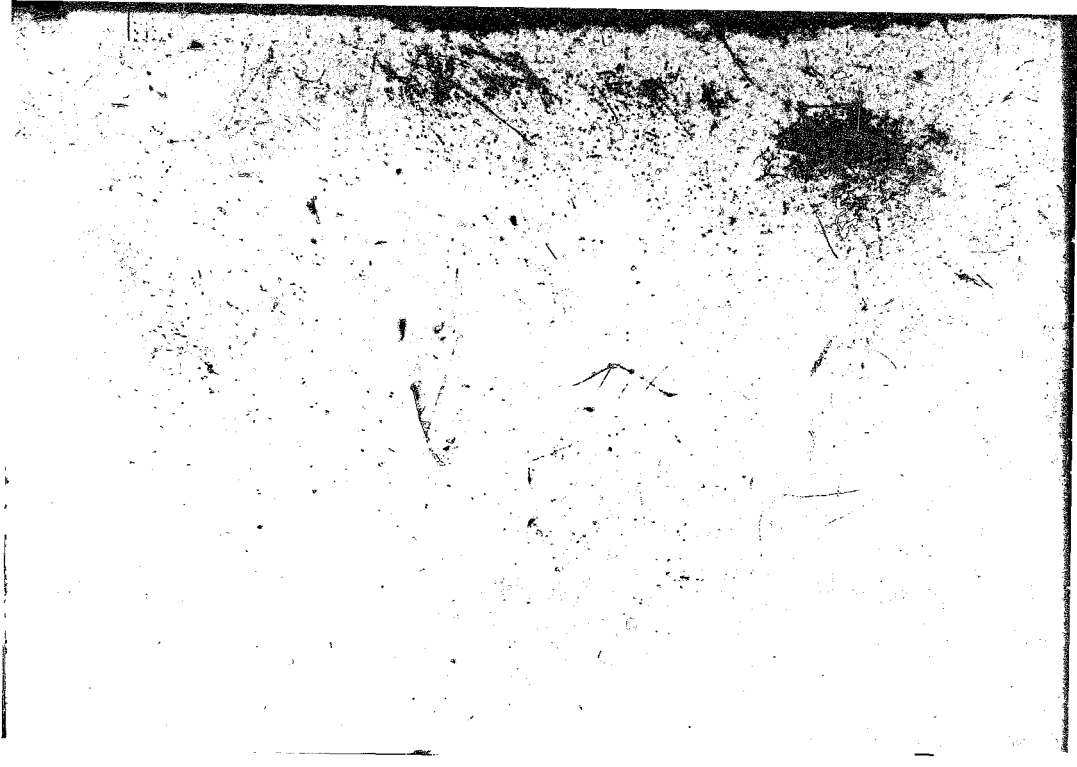
KHACHATUROR, T.S. GOODWIN, P.B. Ed The Economics of Long Distance Transportation, Proceedings of a Conference held by the International Economic Association in Moscow, 1983.

MCYER, J.R., KAIN, J.F. WOHL, M. The Urban Transporation Problem, Massachusetts : Harvard University Press, 1965.

LIUDENTHAL, K.M. Issues in Transportation Economics, Ohio : Charles E Marril Books, Inc., 1965.

SNYMAN, D.J. SHAHIA, M., POTGIETER, W.F., Ed Transport, Proceedings of the Second Transport Conference held at the University of South Africa, 1977.

WELGEMOED, P.J., PRINSLOO, G.C., MASSON, W.J., Ed Urban Commodity Flow, Symposium on Transport held at the Rand Afrikaanse University, Johannesburg, 1975



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