

CHAPTER 5: THE ECONOMIC IMPORTANCE OF TRANSPORT INFRASTRUCTURE AND LOGISTICAL HUBS: THE CASE OF THE VAAL LOGISTICAL HUB

5.1 INTRODUCTION

This chapter provides an investigation into the importance of transport infrastructure and establishes a link between transport infrastructure and economic development. The current condition of the Gauteng-Durban and Gauteng-Cape Town freight corridors are investigated to further promote the importance of the VLH as a means of access to these corridors.

The economic impact of several international logistical hubs is used as a yardstick to determine the possible impact that the VLH would have on the local economy of the Vaal region. Of particular importance is the new logistical hub that is being developed near City Deep and Oliver Tambo International Airport, as this would provide a more accurate picture of the possible outcome of the VLH.

In order to determine stakeholder interest in the proposed VLH, an industry survey was conducted. Targeted questions have been selected from the questionnaire and presented in terms of general opinions of the respondents and a further breakdown into size and economic sector of the respondents concerned. This breakdown was done in order to determine whether or not the VLH would be well received by its intended target industry, namely, medium to large undertakings in the primary and secondary sector. The small and tertiary sector undertakings are not to be discounted but will most likely only make use of the VIDZ at a much later stage in the project.

The origin and destination of goods imported into and exported from the Vaal is illustrated. This serves to pinpoint the need for intermodal or multimodal transport services that link with the Gauteng-Durban and Gauteng-Cape Town corridors.

The opinion of local freight forwarders was also gathered in order to further establish the need for extended transportation and logistical services within the Vaal region. Lastly, an interview with one of the main role-players within the Vaal region, i.e., Mittal Steel was conducted so as to gain an understanding of the needs of the local industry cluster leader.

5.2 THE ECONOMIC IMPORTANCE OF TRANSPORT INFRASTRUCTURE

One of the main goals of a developing nation like South Africa is the maintenance and improvement of the living standards of its citizens. According to the Department of Transport (DoT, 1998:36) the achievement of this goal depends on the nation's ability to increase capital investment, labour productivity and the continuous improvement of those industries in which it competes on a global scale.

As an economy that functions predominantly on primary and secondary economic activities, South Africa is forced to employ various strategies that focus on the inherent economic strengths of regions within the country. Jourdan (1998:718) emphasised the importance of these regional development initiatives as a means of enhancing the economic potential of the region concerned (see Chapter 3, section 3.2). However, investment in a particular industry or activity is not always the catalyst for economic growth and exogenous influences, such as Blue IQ initiatives, are often needed to provide the push necessary for change to occur.

Infrastructure that is both efficient and productive is one of the key features of a growing economy. According to the DoT (1998:35), investing in assets such as road and rail networks would enable regions and localities to enhance levels of development within their borders and thereby, aid the creation of wealth and economic opportunities through increased competitiveness. The development of a logistical hub fits the requirements for a project that not only enhances infrastructure, which is essential for economic growth, but also provides that opportunity for competitive enhancement of a locality.

Transport infrastructure is generally seen as an enabling industry as it is a catalyst for growth and guarantees regional, national and international integration. Transport infrastructure has the capacity to ensure that national and social objectives are met, thereby becoming a critical input for those industries outside of the transport industry. The most important of these objectives are the following (DoT, 1998:35):

- Economic growth and improved standards of living;
- Increased trade along major routes within the country and between trading partners, such as though countries of the Southern African Development Community (SADC);
- Employment creation; and
- Increased social integration (the movement of underprivileged members of society into mainstream society).

Rodrigue (1998) states that when transport systems are efficient the economic and social benefits would have several positive multiplier effects, such as better accessibility to markets, enhanced competitiveness, job creation and endogenous investment within the region. A deficient transport system reduces capacity, reliability and accessibility of an industry and retards any avenues of possible growth.

Havenga (2010:460) indicates that freight transport networks are one of the key challenges that South Africa must overcome in order to improve competitiveness, create sustainable development initiatives and ensure upliftment of impoverished citizens. The Presidency (2007), in its Accelerated and Shared Growth Initiative for South Africa (ASGISA) and Finance Minister Pravin Gordhan (Gordhan, 2010) have both stated that the inefficiency and insufficient capacity of the national freight and logistics system is one of the factors that hamper South Africa from achieving sustainable economic growth.

Havenga (2010:463) has identified a number of international studies that highlight the relationship between logistics and national competitiveness:

- The United Nations (UN, 2002:22) had identified that the efficiency of a country's logistic chain is vitally important in enhancing the competitiveness of important industries;
- The World Trade Organisation (WTO, 2004) the effective rate of protection provided by transport costs is often higher than that provided by tariffs;
- Lakshmanan and Anderson (2002:3) have identified that an improvement in the productivity of the freight transport sector would cause an improvement in the productivity of the economy as a whole; and
- Ravn and Mazzenga (2004:657) have determined that a decrease in transport costs from 20% to 15% of GDP is equivalent to an increase of 1.5% in domestic consumption.

The economic impact of transport infrastructure should be considered as either a direct or an indirect impact which takes place at the microeconomic or macroeconomic level. These impacts are summarised in Table 5.1. Rodrigue (1998) differentiates between direct and indirect impacts as the following:

- Direct impacts are related to a change in accessibility where transport infrastructure enables larger markets to function at a lower cost due to shortened supply chains, enhanced competition and agglomeration economies; and
- Indirect impacts are related to the multiplier effects where either the prices of goods and services declines or the variety of the product base increases due to the enhanced transport infrastructure.

These direct or indirect impacts can then be interpreted from either a macroeconomic or microeconomic perspective (Rodrigue, 1998):

- At the macroeconomic level, transport infrastructure is essential for the entire economy as it lends a level of mobility to the national economy. Mobility is seen as one of the determining factors in development of a nation as it links output to employment creation and income within a locality. Increased mobility means greater levels of development; and
- At the microeconomic level, transport infrastructure plays an essential role for certain industries as it is the only means with which to link consumers,

producers and the products in the value chain (as seen in see Figure 3.3, Chapter 3).

Table 5.1: Economic benefits of transportation

Transport supply (direct)	Transport demand (direct)	Microeconomic factors (indirect)	Macroeconomic factors (indirect)
Increased income earned from transport operations	Improved accessibility to transport infrastructure	Income from rent of land	Distribution networks created
Increased distribution market accessibility	Productivity gains through enhanced competitiveness	Cheaper commodities due to shortened supply chain	Economic activities attracted to region due to agglomeration
	Time and cost savings through shortened supply chain	Increased supply of commodities through wider range of transport	Increased competitiveness
	Broader supplier and consumer base through expanded market accessibility		Higher levels of consumption due to enhanced market accessibility
	Economies of scale created through agglomeration		Mobility enhanced through improved transport infrastructure

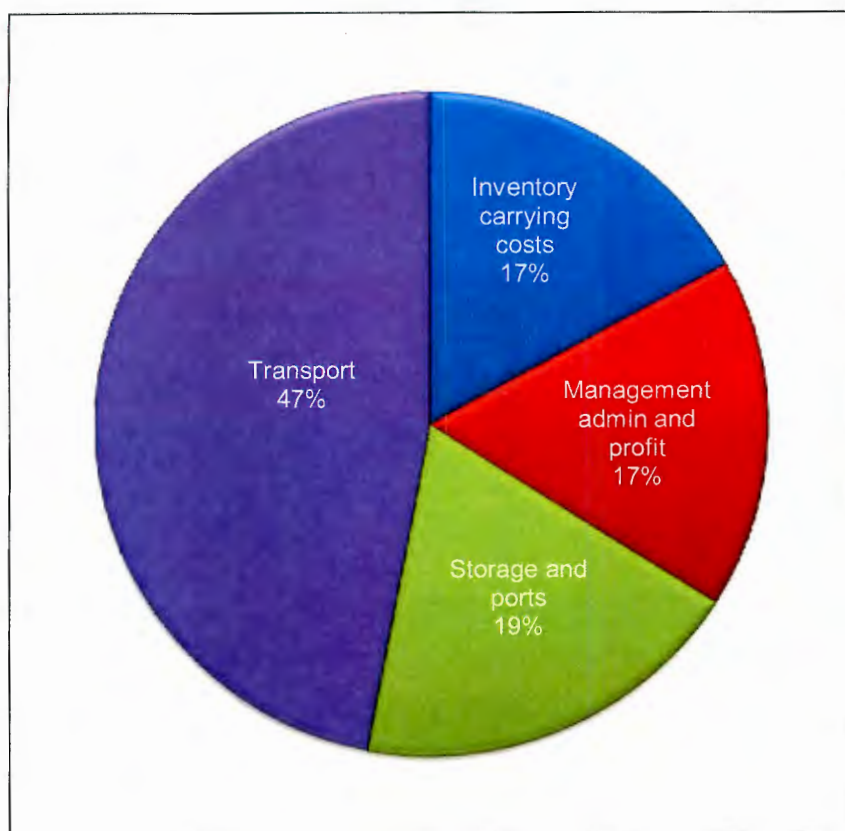
Source: Rodrigue (1998)

Transport infrastructure links the factors of production between producers and consumers and plays a key role in reducing the cost involved in transporting goods from producers to the relevant markets and will also enhance the reliability of shipping goods from South Africa to its trading partners. South Africa's economic activities are predominantly primary and secondary in nature. The transport system within an economy essentially supports the transition from a manufacturing to a service driven economy and often contributes a large percentage to the overall GDP of a country (Havenga, 2010:476).

The CSIR conducted a State of Logistics Survey in 2008 which distinguished between the cost incurred in the primary and secondary sector of the economy.

These costs are divided into the categories illustrated in Figures 5.1 and 5.2. As of September 2010, transport contributed 7.8% to the GDP of the country and contributed 32.0% to the GDP of Gauteng alone (Stats SA, 2010:38-47), while remaining one of the largest cost components of primary (47%) and secondary (58%) sector logistics.

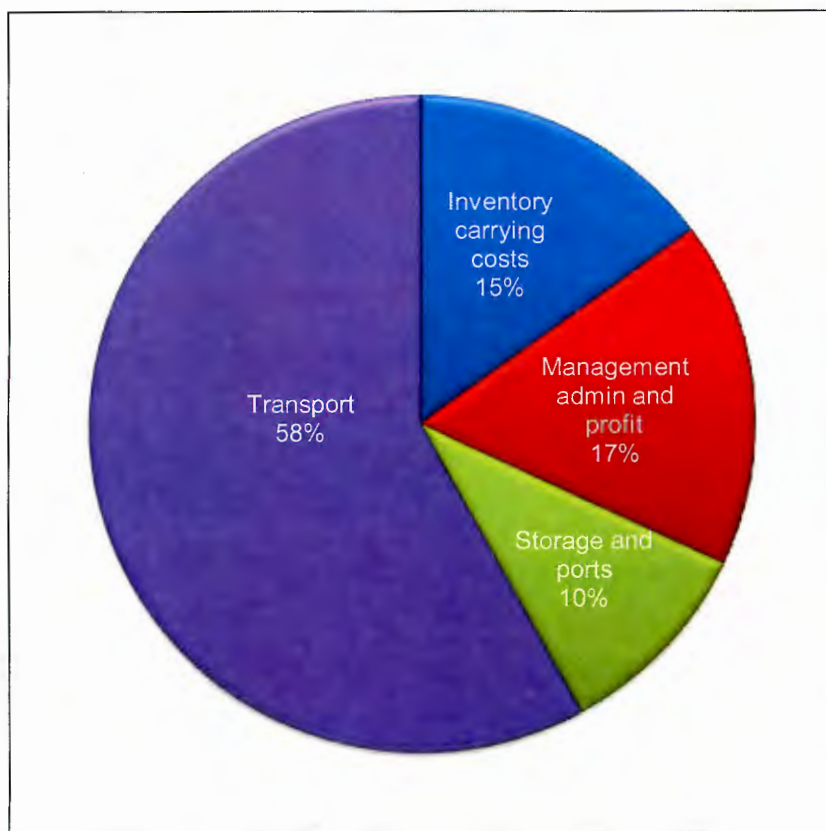
Figure 5.1: Primary sector logistics costs



Source: CSIR (2008:19)

According to the DoT's National Freight Logistics Strategy (DoT, 2005:8) the total income earned from the South African transport industry was R121 193 million and the expenditure incurred was R110 206 million. The GDP contributions, income and expenditure by the various modes of transport are indicated in Table 5.2. Road and rail contribute the largest percentage to GDP (41.5% income and 43.0% expenditure). The second largest category is supporting land transport activities such as storage/warehousing and packaging.

Figure 5.2: Secondary sector logistics costs



Source: CSIR (2008:19)

Table 5.2: Income and expenditure across transport modes

Mode of transport	Income (2002)		Expenditure (2002)	
	% contribution to GDP	Income (R million)	% contribution to GDP	Expenditure (R million)
Road and rail	41.5	50 323	43.0	47 414
Supporting land transport activities	33.5	40 628	35.5	39 083
Air	21.2	25 648	18.3	20 153
Water	3.8	4 594	3.2	3 556
Total	100.0	121 193	100.0	110 206

Source: Stats SA (2002:2)

5.2.1 The role of transport infrastructure in economic development

Transport infrastructure has often been the catalyst for economic and social transformation (Rodrigue, 1998). Bartolomeu Dias, Christopher Columbus, Henry Ford and Wilbur and Orville Wright ushered in new eras of trade and indirectly enhanced globalisation through the use and development of transport infrastructure.

In developing nations, the lack of transport infrastructure has been cited as a cause of higher transport costs and unreliable supply chains. As a counter to this, the DoT (2005:37) envisions a transport sector that contributes to sustainable economic growth and development. Investment in the transport sector would link productive units and underutilised agglomeration economies to the international and domestic markets, thereby promoting competition and enhancing productivity. Efficient and productive transport infrastructure is seen as reducing logistics costs which would reduce the cost of living and production through excess capacity. Transport should contribute to South Africa's socio-economic development in the most sustainable manner possible and must eradicate operational bottlenecks in the country.

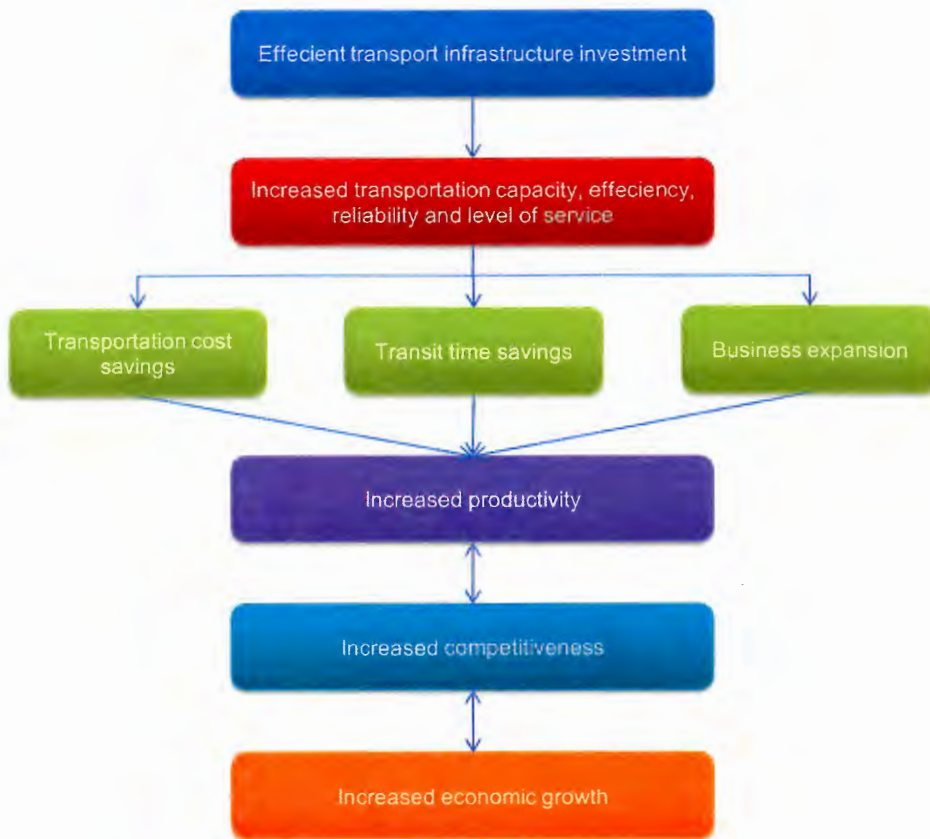
As part of the transport objectives of the Millennium Development Goals (MDGs), the UN cited reduced cost and efficient transportation systems for landlocked regions and countries as one of the targets that must be met by 2015. As such, the DoT (2005:36) outlines the role of the transport sector, which holds true for freight transport, in achieving, amongst others, the MDGs mentioned above. The roles are as follows:

- Transport infrastructure is a fundamental key in promoting economic growth and development within developing countries. Most developed nations have highly advanced logistics systems; and this has provided the countries concerned with the drive to achieve greater economic growth through transport infrastructure investment;
- Transport infrastructure is a means to achieve the harmonisation of transport systems throughout a particular region;

- Freight logistics has contributed to the economic growth of regional trading blocs and agreements such as SADC, New Partnership for Africa's Development (NEPAD), Mercado Común del Sur (MERCOSUR) and the African Growth and Opportunity Act (AGOA); and
- Reliable transport services are required to ensure the supply chain competitiveness of domestically produced goods.

Gibb (2007) outlines the relationship between transportation and the economy. Figure 5.3 illustrates this relationship and shows the interdependence and influence of the different aspects involved. As transport infrastructure becomes efficient and reaches higher levels of investment, benefits such as increased capacity, efficiency and reliability will occur. These benefits, in turn, create transport time and cost savings as well as the possibility of business expansion. These productivity gains are then transferred to increased competitiveness which will ultimately increase economic growth within a nation.

Figure 5.3: Transport infrastructure and the economy



Source: Gibb (2007)

5.2.2 Transport infrastructure and regional economic development

Rodrigue (1998) indicates that economic development has become increasingly reliant on relationships across economic regions than those amongst economic resources. Jourdan (1998:717) highlighted the need for targeted programmes which focus on regions that have the greatest potential for development (as seen in Chapter 3, section 3.2). When seen as a factor of production, any change in the transport sector would have a substantial impact on cost and performance of industries. Rodrigue (1998) provides these impacts with a spatial perspective:

- *Geographical specialisation* – in the case of the Vaal region (known for specialisation in the petro-chemical and steel industries), geographical specialisation is supported by an efficient transport system and promotes

economic productivity. Comparative advantages accrue to the regions concerned;

- *Large scale production* – an efficient transport system which offers time and cost savings as well as enhanced reliability, enables goods to be transported over longer distances. This promotes economies of scale as larger markets can be accessed;
- *Increased competition* – an efficient transport system enables potential markets to be opened to the producer and thereby increases competition within the market concerned; and
- *Increased land value* – In the case of the proposed site for the VLH, the utility for the area would increase as a result of the higher incidence of economic activity taking place within the Vaal.

The Organisation for Economic Cooperation and Development (OECD, 2002:9) identifies the following aspects as possible spillovers resulting from investments in transport infrastructure:

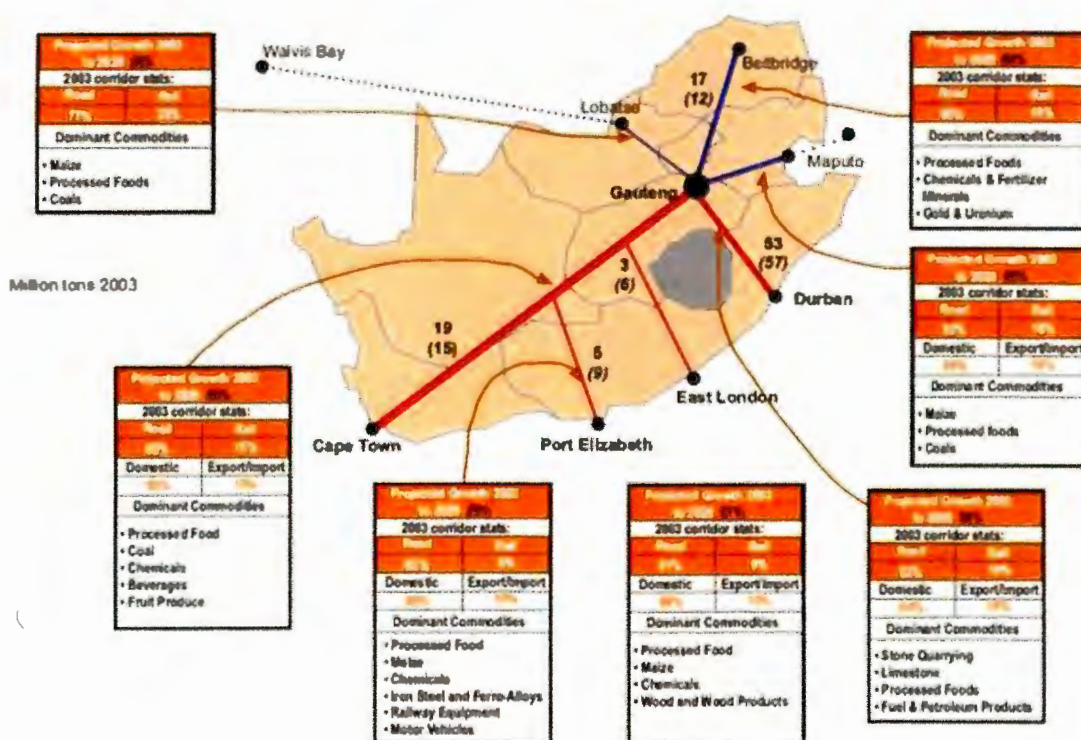
- *Accessibility* – regional accessibility is improved which, in turn, increases the market size for manufacturing activities as well as labour and tourism. The increased market size will lead to increased competition and possible centralisation of economic activity;
- *Employment* – regional employment is particularly important in the Vaal region. The maintenance and operation of the VLH would increase employment through both created and relocated jobs. This would depend on the level of traffic through the hub; and
- *Efficiency* – for any industry within a given region, the time and cost savings as well as the increased reliability and accessibility would lead to productivity gains that could be achieved through enhanced production and distribution.

5.2.3 Existing transport infrastructure in Gauteng

Gauteng remains the main industrial hub of South Africa and contributes 33.9% to the overall GDP of the country (Stats SA, 2010:38). There are 7 primary freight corridors in the country. Figure 5.4 illustrates the projected growth of these corridors as well as the commodities transported along these routes. The Gauteng – Durban (N3) corridor is expected to grow by 38% and the Gauteng –

Cape Town (N1) corridor by 40% in 2020. Should there be no growth in transport infrastructure this growth cannot be supported. Table 5.3 shows the projected increase in container volumes at the Durban and Cape Town ports. The increased growth in port container traffic will further increase the need for enhanced road and rail transport networks.

Figure 5.4: Current and projected corridor volumes



Source: DoT (2005:26)

According to the DoT (2005:26) the projections from 2003 to 2020 show possible capacity constraints that must be addressed in order to maintain a competitive position in the global economy. Moving South Africa (DoT, 1998:11) has identified 3 strategic actions that are required in the freight transport system:

- Build density in the transport system by enhancing the capacity of existing freight corridors. This is done by improving infrastructure and attracting investment to the transport system;

- Create economies of scale within transport modes by increasing the competitiveness of transport nodes and offering increased capacity where economically sustainable; and
- Improve levels of competition by improving integration amongst the various modes and building an industry platform that drives the process of innovation and differentiation.

Table 5.3: Projected container volumes

<i>Port</i>		2005	2020	2035	2050
Durban	TEU ¹	1 690 000	5 363 000	8 065 000	8 065 000
	Berths ²	8	20	20	20
Cape Town	TEU ¹	609 000	1 933 000	2 742 000	2 742 000
	Berths ²	4	6	6	6
¹ Twenty-foot equivalent (TEU) is a measure of capacity used in containerisation ² Berths refers to the specific location where a ship is berthed for the purpose of loading or unloading goods.					

Source: CSIR (2007:20)

The VLH would meet the requirements stipulated by the MSA (1998:11) strategic actions mentioned above. The VLH would be connected to two of the major freight corridors in South Africa, namely the Gauteng – Durban (running along the N3 highway), and the Gauteng - Cape Town (running along the N1 highway) corridors. Several opportunities exist in these corridors, which the VLH would utilise to the benefit of the region at large.

5.2.3.1 The Gauteng – Durban (N3) corridor

According to the DoT's National Freight Monitoring Framework (DoT, 2007:6) the Durban to Gauteng line is the most important rail freight line in South Africa. The transport of goods by road and rail in the corridor is mostly done through containers. The DoT (2005:27) highlights certain strategic issues that are facing the corridor:

- MSA projected the capacity of the corridor to reach 57 million tons by 2020;
- As of 2004, the corridor was already close (53 million tons) to the 14-year capacity projected by MSA and is expected to grow by 35% by 2020;
- The operational capacity of rail networks has been established at 20% and is constrained by a lack of freight lines and trained personnel to handle the backlog;
- Delays at marshalling yards (Durban port and City Deep) decrease the competitiveness of rail;
- Asset age at terminals (such as City Deep) reduces the efficiency of rail; and
- Traffic is not evenly balanced along the route.

According to Pienaar (2005:263), the total number of containers transported along the corridor was estimated at 1 603 924 (in 2004). Of these, 138 871 was transported by rail and 1 465 053 was transported by road. In Figure 5.3, it is clear that the predominant mode of transport is road as it is projected that road freight transport will increase by 82% from 2004 until 2020. Seeing as though the rail line between Durban and Gauteng is only utilised at 30% of its total capacity, this severely constrains road networks along the corridor.

As seen in Table 5.3, the projected container volumes that will be moving along the corridor will reach absolute capacity by 2035 (no growth in 2050). A move to intermodal transport and the increased utilisation of rail as a means of transport is essential. The use of rail, being a more energy efficient means of transport, would decrease transport costs along the corridor. This in turn would increase efficiency and productivity. The VLH would be able to utilise the excess capacity of the N3 corridor rail facilities.

5.2.3.2 The Gauteng – Cape Town (N1) corridor

The NFMF (DoT, 2005:10) has identified the Gauteng-Cape Town corridor as being part of the North-South corridor which runs from Cape Town to Harare. Containers are transported by both road and rail between the relevant ports and Gauteng. However, major capacity constraints at City Deep have caused bottlenecks in road freight transport. The DoT (2005:27) has identified the following strategic issues facing the corridor:

- Of the 19 million tons of freight transported along this corridor, more than 17 million is consumed locally;
- The capacity constraints facing ports in Cape Town are not as dire as those in Durban (where urgent expansion is needed) and expansion can take place between now and 2020;
- Rail is underutilised; and
- Road corridor capacity is constrained by single lane traffic along a portion of the corridor.

The VLH would be the perfect project to reduce the capacity constraint which exists in this corridor. The excess carrying capacity of existing rail networks can also be utilised by the VLH. The existing industries in the Vaal would be able to gain greater access to the major transport routes in the province, thereby enhancing local capacity, competitiveness and welfare.

5.3 THE ECONOMIC IMPORTANCE OF LOGISTICAL HUBS

In his 2005 book, *"The World is Flat"*, Thomas Friedman postulates that, in terms of commerce, the playing field is level and all competitors (worldwide) have an equal opportunity. This would be an adequate assumption if the *ceteris paribus* principle was applied across all nations and across all industries of the world. South Africa, like other developing nations, is at a distinct disadvantage when compared to the developed economies of the world, such as Japan, the United Kingdom (UK) and the United States of America (USA), as South Africa has a lack of intermodal and multimodal integration and transshipment facilities.

Multimodal transport is defined as a means of shipment that combines multiple variations of the different transport modes (air, rail, sea and road). The freight forwarder, in determining the lowest possible cost to the producer, will combine the modes of transport in the most cost efficient configuration. DeWitt and Clinger (1999:1) define intermodal transportation as the use of only two or more modes to move a shipment of goods from their point of origin to their destination. The existence of both multimodal and intermodal means of transportation is a critical factor in the successful execution of value chains

within a region and will also bring about regional spillover effects to an economy.

Despite the benefits of intermodal and multimodal transportation, several key challenges still exist. These are indicated in Figure 5.5.

Figure 5.5: Key challenges concerning intermodal connectivity



Source: DoT (2005:21)

A logistical hub is seen as a platform for both multimodal and intermodal transportation that overcomes the key challenges indicated in Figure 5.5. Henk (2003) states that an inland port is a site that is located away from the traditional land, air and coastal borders. The port would facilitate international trade through investments in multimodal transport infrastructure and by promoting value-added services as goods move through the value chain. Transport activities within these hubs are managed so as to keep costs down and simplify the movement of goods from producers to consumers.

Goh (2008) has identified the possible drivers for the selection of logistical hubs as a means of regional development:

- Demand side forces such as improved accessibility, enhanced reliability, benefits of intermodal transport, enhanced connectivity between industry and consumer;
- Supply side forces, which include reduced transport costs, economies of scale and scope, upstream and downstream industries realise benefit of co-operation, risk reduction through consistent service; and
- Enhanced efficiency, service quality and production capacity.

King and Keating (2006) and Baluch (2005:159) have identified, amongst others, the following checklist of items that can be used to determine the success of a regional logistical hub:

- Transport infrastructure – transfer between modes of transport should be seamless;
- Basic services – electricity, water and sanitation services;
- Economic activity – economic sectors that would make use of the hub;
- Workforce – available labour force for all levels of work (skilled, semi-skilled and unskilled);
- Highway, railway and airport access – proximity to major road and rail networks as well as proximity to airport terminal; and
- Proximity to market – length of supply chain.

5.4 THE EFFECT OF THE VAAL LOGISTICAL HUB ON LOCAL ECONOMIC DEVELOPMENT IN THE VAAL REGION

As the VLH is only a proposed project to enhance LED within the Vaal region. Further investigation into the actual number of employment opportunities created and the increase in investment within the region would have to be done. However, this would be a high-cost undertaking. The VLH is a similar project to those discussed in Table 5.4. By taking the economic impact of these domestic and international logistical hubs into account, it can be postulated that the VLH would have a similar impact on the economy of the Vaal region. Table 5.4 highlights the projects' impact in terms of job creation and investment within the

region of implementation. Infrastructure available to the hubs has also been highlighted.

As seen in Table 5.4, all of the projects discussed have access to road, rail and airport terminals. On average, all of the projects discussed in Table 5.4 would create around 26 000 direct jobs. Direct employment opportunities are those created directly to serve the operational needs of the hub concerned. According to Els (2010), Tambo Springs, which has access to the same road and air transport networks as the VLH, would create anywhere between 37 000 and 57 000 jobs (depending on downstream activities that locate to the region). Of these employment opportunities, 28 000 to 42 000 would be from logistics operations alone, while 9 000 to 14 000 would result from related activities located in the VIDZ. During the first phase of the project, it is estimated that R 1 billion in investment will be generated within the region.

The effect of Tambo Springs on its locality would be mirrored by that of the VLH on the Vaal economy. The same number of jobs can be generated by the VLH and, given that the VLH is within close proximity to rail facilities, the effect of the project would be further reaching than that of Tambo Springs. As indicated by the DoT (2005:26), the major freight corridors are expected to grow by 38% (Gauteng-Durban corridor) and 40% (Gauteng-Cape Town corridor) respectively by 2020. With its large manufacturing base, the Vaal region would be in a prime position to utilise this growth opportunity in order to reduce transport costs, enhance competitiveness and expand local market access by establishing the VLH.

LED was defined as any intervention that would address a socially and economically unacceptable situation in a locality (as seen in Chapter 2, Section 2.2). By establishing the VLH, an average of 26 000 jobs will be created in the region. This would go a long way to decreasing the 54% unemployment rate as seen in Chapter 4, Section 4.4.2) recorded in the region. The manufacturing sector is the predominant economic sector in the Vaal, with 49.1% backward linkages (as seen in Chapter 4, Section 4.5.2.2.1).

Table 5.4: Economic impact of domestic and international logistical hubs

	Dallas Logistics Hub	Detroit Regional Hub	Alliance Global Logistics hub	DHL Hub	Tambo Springs
Location	Dallas, Texas (USA)	Detroit, Michigan (USA)	Fort Worth, Texas (USA)	Leipzig, Germany	Johannesburg, South Africa
Number of jobs created (direct and indirect)	30 000 direct jobs	66 000 direct jobs	29 710 direct jobs	3 500 direct jobs	28 000 to 42 000 direct jobs
			63 388 indirect jobs	7 000 indirect jobs	9 000 to 14 000 indirect jobs
Investment for region created	\$2.4 billion (on completion)	\$10 billion (over 10 years)	\$36.4 billion (from 1990 to 2008)	€300 million	R1 billion (during first phase)
Infrastructure access	• Adjacent to Union Pacific Dallas Intermodal Facility; • Access to 4 major freight corridors (I-20, the I-35 NAFTA corridor, I-45 and the Trans-Texas corridor); and • Adjacent to Lancaster Airport.	• Access to Detroit Metropolitan Airport; • Access to 4 Class 1 railways; and • Serves as corridor between the USA and Canada.	• Access to 2 Class 1 railways; • Access to Fort Worth Alliance Airport; • Access to Highway 35W from Mexico to Canada; and • Near FedEx Southwest Regional Sort Hub.	• Access to the Leipzig/Halle Airport; • Direct connections to Europe and Asia; and • Access to Frankfurt Main Airport.	• 25km from OR Tambo International Airport; • 22km from City Deep; and • Access to N1 and N3 corridors.

Source: Dallas Logistics Hub (DLH, 2007); Detroit Regional Chamber (DRC, 2009); Alliance Texas (1990); DHL Hub (2009); and Els (2010).

Any development project should be aimed at developing the major manufacturing industries within the region. As discussed in the previous chapter, an investment of R 1 million would not only increase employment in all economic sectors of the Vaal but would also increase annual household income and investment in the region as a whole. The VLH would clearly address both poverty (increasing household income) and unemployment in the Vaal, thereby increasing LED.

5.4.1 Participation by local role-players: results of the industry questionnaire

In order to further highlight the need for the VLH and to promote PPPs in the Vaal region, a survey of industry role-players with regard to their level of participation within the VLH was conducted. For the purpose of the industry questionnaire 194 respondents were surveyed from March 2006 to August 2006 using the simple random sampling method and structured interviews which were conducted by fieldworkers. The respondents covered a wide range of economic activities in the ELM, MLM and MMA, with a range of business sizes and economic sectors being targeted.

5.4.1.1 Origin and destination of goods within the Vaal

The majority of products either imported or exported into the Vaal are from or are being delivered to regions within South Africa. This can be seen in Figure 5.6 and Table 5.5 respectively. Of goods within the Vaal, 73.7% has South Africa as their country of origin, while 29.9% has an international destination.

Of all goods produced within the Vaal region, 70.1% has South Africa as their point of destination with 29.9% destined for an international location. Figure 5.7 illustrates origin and destination of goods produced within the Vaal. Europe and Africa are the major points of destination for goods produced within the Vaal region with Africa accounting for 8.8% and Europe accounting for 7.5% of goods destined for international locations. Of the goods produced in the Vaal, only 0.5% is destined for the Middle East and 1.0% for Australasia (see Table 5.5).

As inputs to industrial activities within the Vaal, goods originating from Europe account for the greatest share (11.2%) of the total 26.3% of all goods originating from an international destination. The second largest contributor to the production process of industries in the Vaal is North America, at 6%.

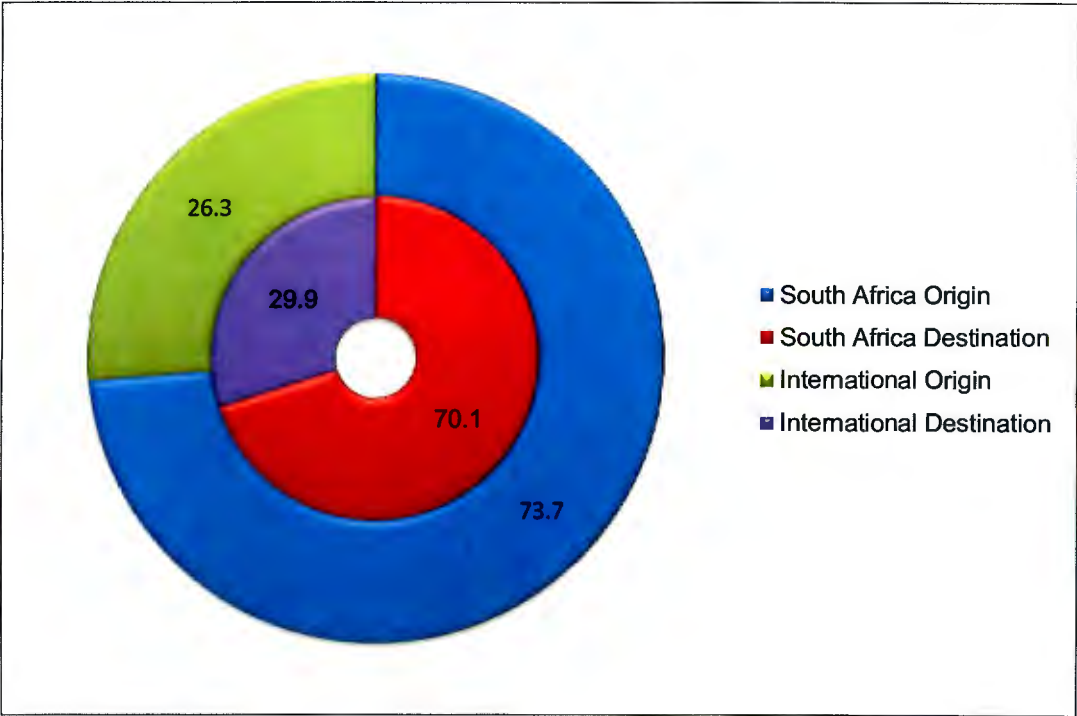
Table 5.6 and Figure 5.8 indicate the regional distribution of goods originating within and destined for areas within South Africa. Of the total volume of goods (73.7% of inputs indicated in Table 5.6) in the Vaal originating from regions within South Africa, 27% originates from the Johannesburg/Pretoria area, while 30% of goods produced in the Vaal are destined for the same region. Port Elizabeth has the lowest (0.3%) percentage share in volume of goods that originate from the Vaal area. As indicated in Table 5.6, of the 73.7% (see Table 5.5) of goods that originate in South Africa, almost one-third (32.4%) originates from the Vaal region itself.

Table 5.5: Origin and destination of goods in the Vaal

Country	Origin	Destination
RSA	73.7	70.1
Total International	26.3	29.9
Total	100.0	100.0
North America	6.0	4.9
South America	0.6	3.2
Africa	2.2	8.8
Europe	11.2	7.5
Far East	2.0	2.0
Middle East	1.4	0.5
Asia	2.0	2.0
Australasia	0.9	1.0
Total	26.3	29.2

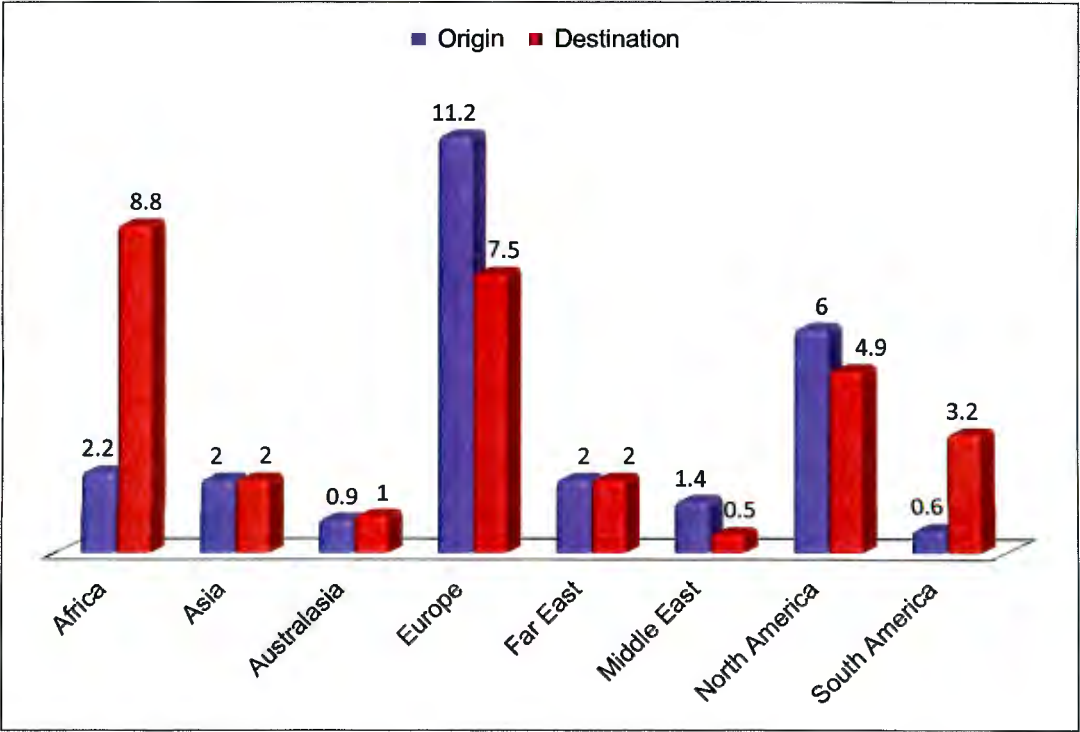
Source: Viljoen (2006a)

Figure 5.6: Origin and destination of goods in the Vaal



Source: Viljoen (2006a)

Figure 5.7: Origin and destination of goods produced in the Vaal



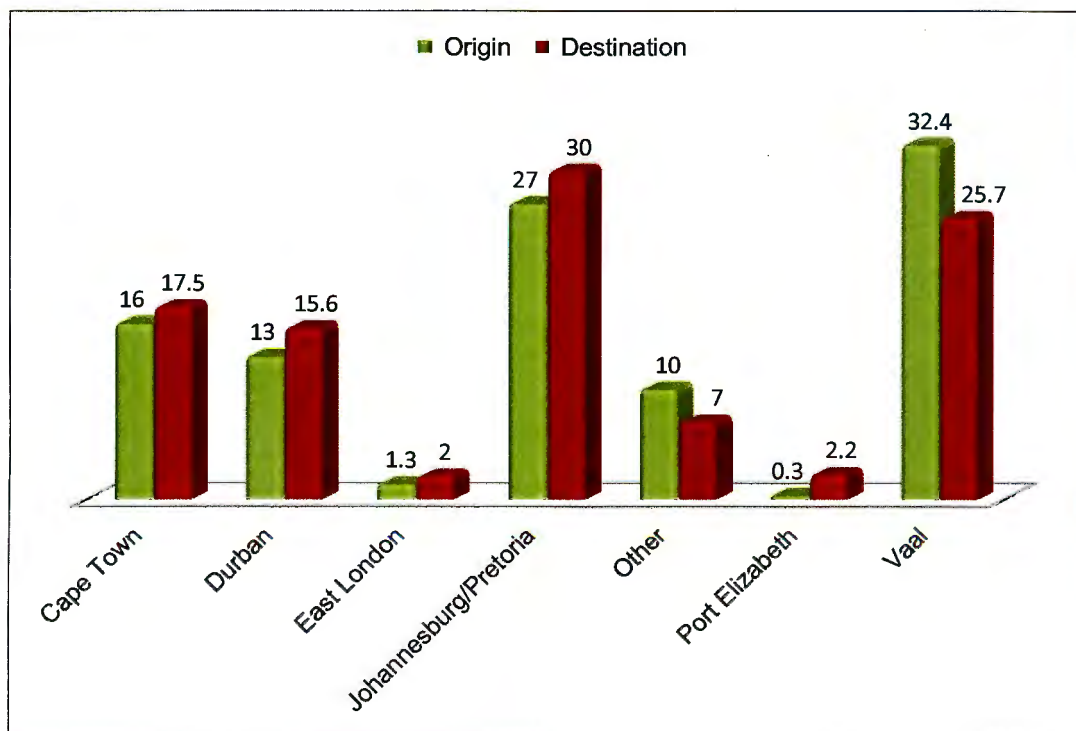
Source: Viljoen (2006a)

Table 5.6: Origin and destination of goods in the Vaal (regional distribution)

Region	Origin	Destination
<i>Vaal</i>	32.4	25.7
<i>Cape Town</i>	16.0	17.5
<i>Durban</i>	13.0	15.6
<i>Port Elizabeth</i>	0.3	2.2
<i>East London</i>	1.3	2.0
<i>Johannesburg/Pretoria</i>	27.0	30.0
<i>Other</i>	10.0	7.0
Total	100.0	100.0

Source: Viljoen (2006a)

Figure 5.8: Origin and destination of goods in the Vaal (regional distribution)



Source: Viljoen (2006a)

5.4.1.2 Modes of transportation used within the Vaal

Figure 5.9 depicts the mode of transport used to deliver goods and the mode of transport used to procure goods respectively. In both cases over half of the goods were transported by road (53% for delivery and 56% for procurement). Rail is the second most used mode of transportation for goods within the Vaal with 34% being delivered via rail and 24% being procured using rail.

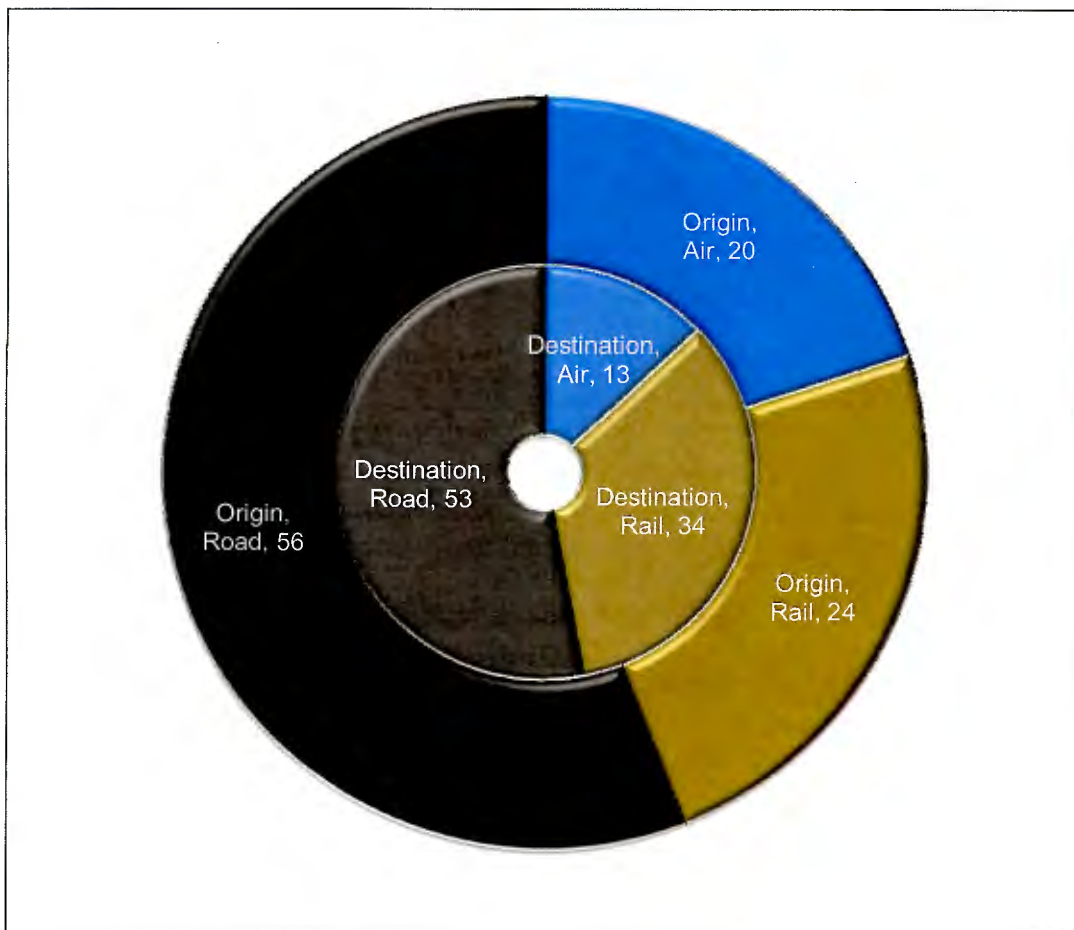
According to the survey data (Viljoen, 2006a), of all the modes of transport, an average of 42% of the volume of goods procured from the Vaal region are shipped to their destination using containers, while an average of 47% of the volume of goods procured by undertakings within the Vaal region arrive in containers. In Table 5.7, the percentage of containerised goods per transport mode is given. Of the 56% and 24% of goods that are transported into the Vaal by road and rail respectively, 50% is shipped in containers. On the other hand, 40% and 35% of the volumes transported by road (40%) and rail (35%) to destination outside of the Vaal are shipped in containers.

Table 5.7: Containerisation of goods

Mode of transportation	Procurement (A)	% of A shipped by container	Distribution (B)	% of B shipped by container
<i>Road</i>	56.0	50.0	53.0	40.0
<i>Rail</i>	24.0	50.0	34.0	35.0
<i>Air</i>	20.0	40.0	13.0	50.0
<i>Total</i>	100.0		100.0	

Source: Viljoen (2006a)

Figure 5.9: Modes of transportation used for procurement and distribution

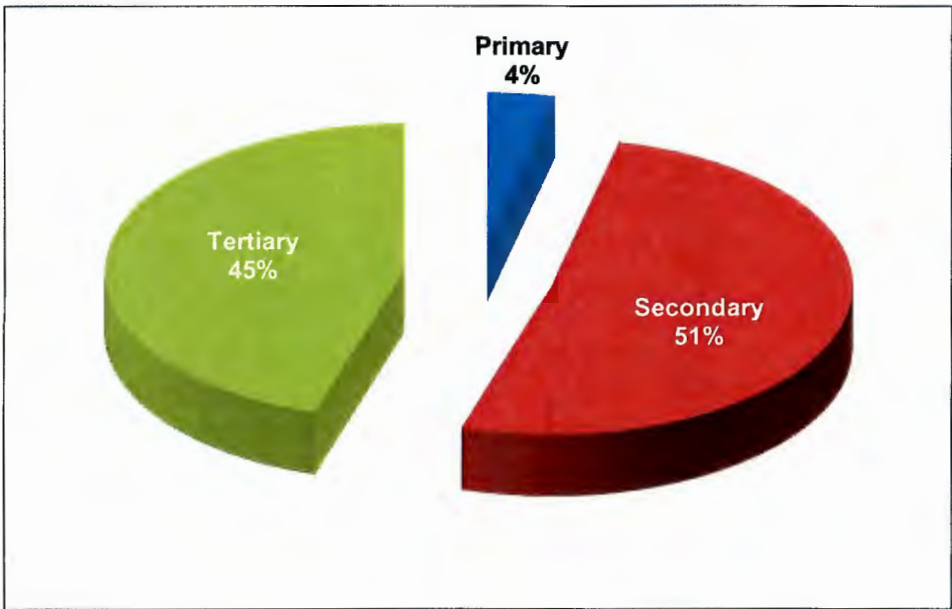


Source: Viljoen (2006a)

5.4.1.3 Prevalent sectoral distribution and business size within the Vaal

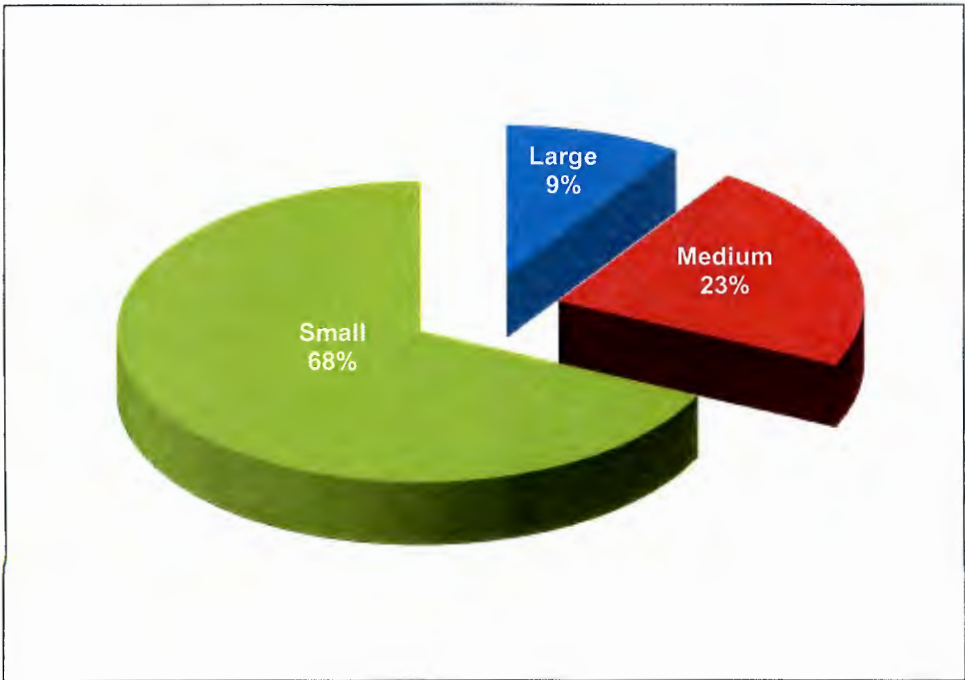
According to the Standard Industrial Classification of all Economic Activities (SIC) developed by the CSS, the industries sampled were grouped into the economic sectors according to the guidelines stipulated in Annexure A (CSS, 1993). Undertakings selected in the sample were classified according to undertaking size classification stipulated by Stats SA (Stats SA, 2003). Small businesses are classified as undertakings with less than 100 employees. Those undertakings with less than 250 employees are classified as medium-sized businesses, while any undertaking with more than 500 employees is classified as a large business.

Figure 5.10: Economic classification of business activities within the Vaal region



Source: Viljoen (2006a)

Figure 5.11: Size of business undertakings within the Vaal



Source: Viljoen (2006a)

Figures 5.10 and 5.11 illustrate the economic classification and size of the undertakings within the sample used as part of the industry survey. More than half (51.2%) of the economic activities within the Vaal are secondary in nature. Primary sector activities only account for 3.6% of all respondents in the Vaal. Of all the respondents, 68% indicated that they are a small business. Large enterprises amount to 9.3% of the total respondents and 22.7% indicating that they are a medium-sized enterprise.

5.4.1.4 Participant preference regarding the Vaal Logistical Hub

As part of the Industry Questionnaire respondents were asked to rate certain statements according to an opinion scale of 1 to 7, where 1 represents “Agree strongly” and 7 represents “Disagree strongly” (see Annexure B). Those that indicated 4 on the opinion scale are considered neutral with regard to the appropriate statement.

Figures 5.12, 5.13 and 5.14 illustrate the results of the Industry Questionnaire with regard to the scale mentioned above. The questions can be grouped according to the following categories:

- Business specific – includes topics such as increased access to markets, increased productivity and sales and possible expansion due to increased accessibility;
- Regional contribution/impact – includes topics such as job creation, welfare, etc.;
- Import/export – covers participant opinion regarding increased import and export activity as a result of the VLH;
- Configuration – pertains to the structure of the VLH itself, namely, the VLH should contain all three proposed projects; and
- Support for the VLH – the extent of usage of the VLH by local role-players.

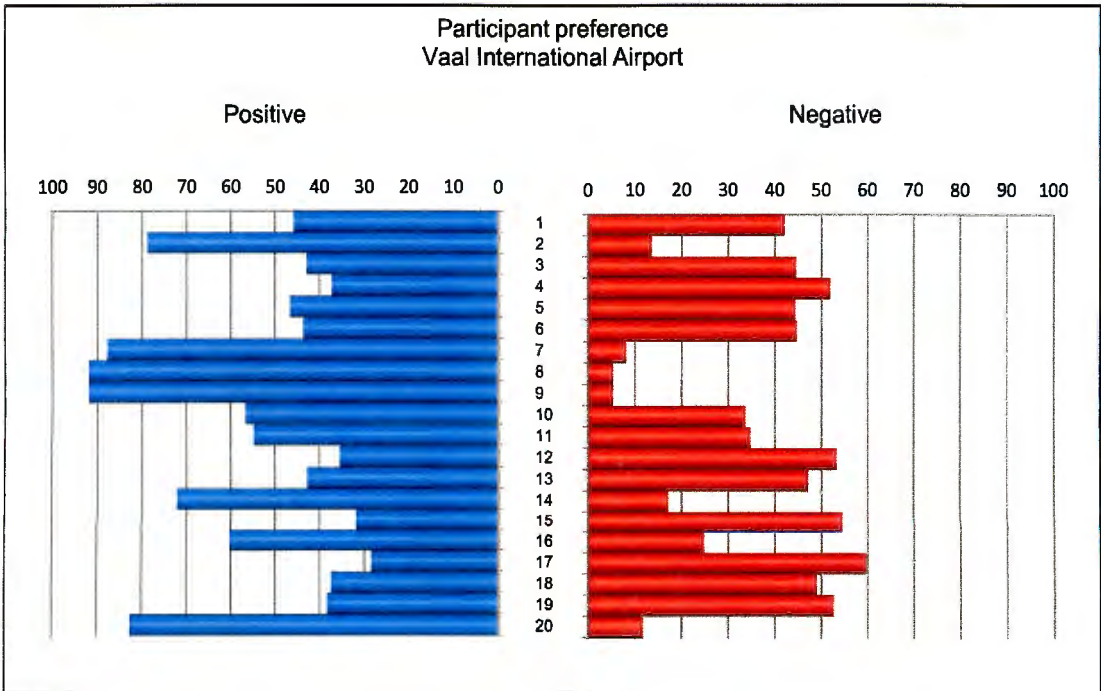
For the purpose of this study, the most important questions relate to the level of usage of the proposed VLH and the possible implications for the business concerned as a result of the project. By assessing whether the local industries would be able to create jobs or expand production as a result of the VLH, one

can then determine whether the result achieved by the projects mentioned in Table 5.4 would be achieved by the VLH.

With regards to the support for the VLH category, 79% of respondents indicated that they fully support the establishment of the VIA (as seen in Figure 5.12). This is echoed in Figures 5.13 and 5.14 with 78% and 85% of respondents indicating support for the establishment of the VICD and VIDZ respectively. Overall, 85% of respondents support the establishment of the entire VLH.

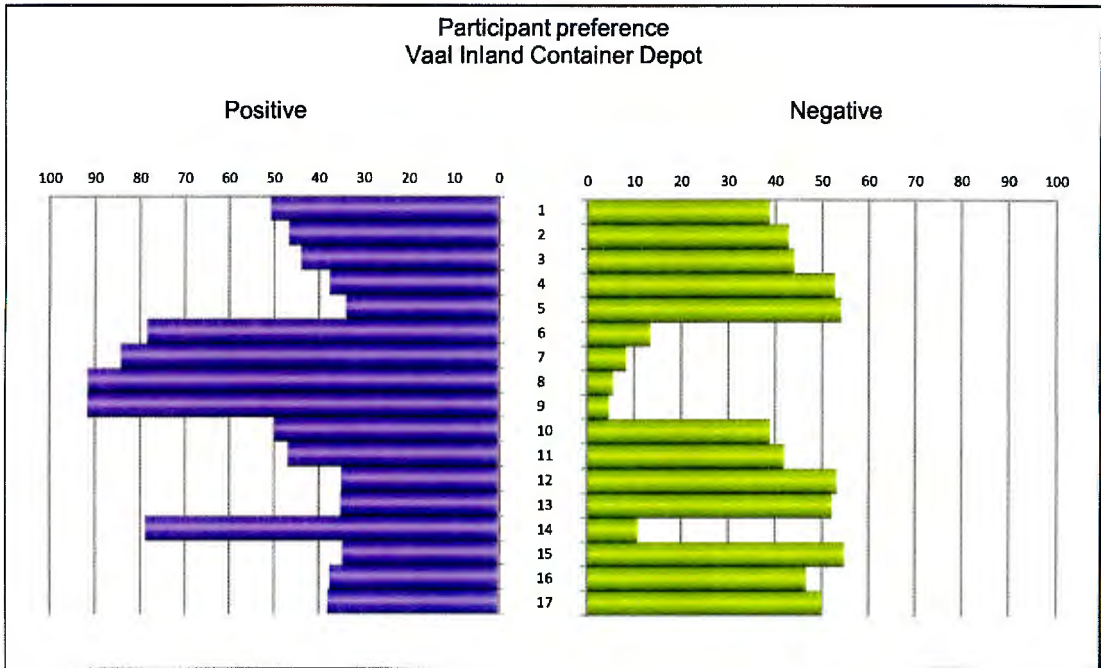
As for the regional contribution or impact of the VLH, respondents indicated that there would be higher levels of job creation (92% for the VIA and VICD and 87% for the VIDZ), higher levels of business confidence (88%, 84% and 87% for the VIA, VICD and VIDZ respectively) and industrial development (92% for the VIA and VICD and 87%for the VIDZ) within the Vaal region. Of the respondents, 83% of had indicated that the VIDZ would be the catalyst for industrial development within the region (see Figure 5.14).

Figure 5.12: Participant preference regarding the Vaal International Airport



Source: Viljoen (2006a)

Figure 5.13: Participant preference regarding the Vaal Inland Container Depot

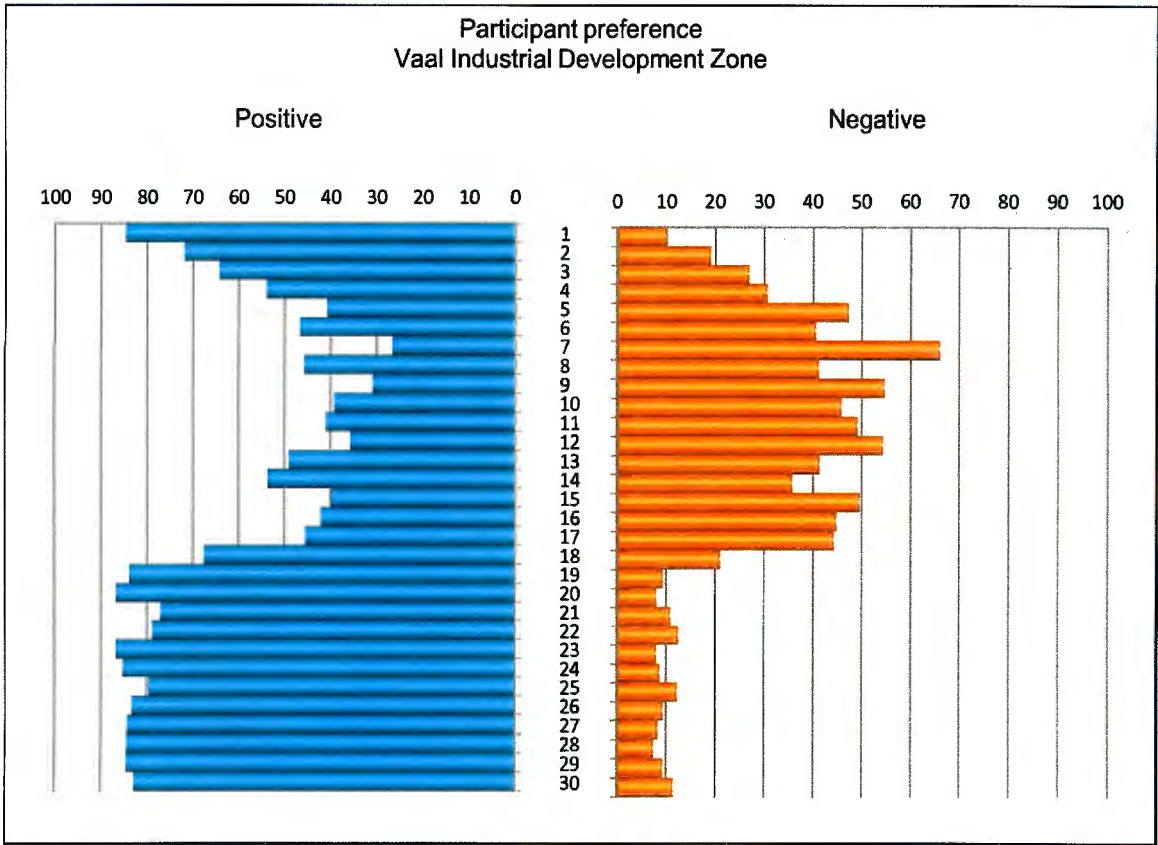


Source: Viljoen (2006a)

Interestingly, 72% of respondents had indicated that they would participate in the activities of the VICD. This would mean that respondents would be willing to relocate to the VLH in order to participate in the downstream activities of the lead firms in the region. Also, 84% of respondents believed that new business opportunities would be created by the VIDZ, which would stem from the new product and value chains that would be created through business relocation to the SDI.

Amongst the positive statements regarding the VIDZ, respondents also indicated that resource-intensive industries can be exploited as a result of the project, production activities can be further diversified (79%) and that the project would eventually lead to an increase in the Vaal region’s GGP (85%) (as seen in Figure 5.14). Of the respondents, 80% indicated that the VIDZ would reduce poverty in the region and 84 % indicated that the project is an ideal LED strategy.

Figure 5.14: Participant preference regarding the Vaal Industrial Development Zone



Source: Viljoen (2006a)

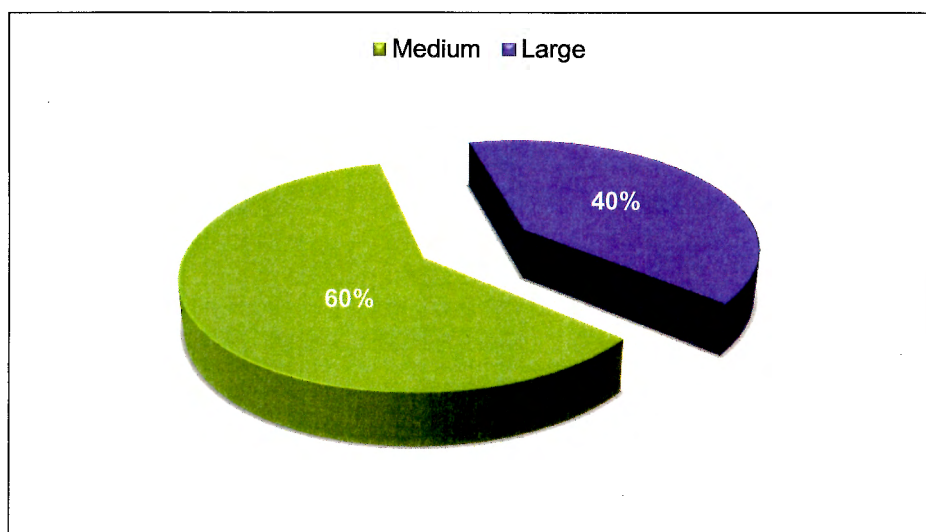
5.4.2 Results of the freight forwarder questionnaire

For the purpose of the freight forwarders questionnaire (Annexure C), 10 freight forwarding companies situated within Gauteng were interviewed during October 2006. The respondents were chosen randomly from the Transvaal Association of Freight Forwarders (TAFF) (Mbendi, 1998). Respondents were asked to indicate the size of their undertaking in relation to the weight forwarded by road/rail in the past year, as well as to highlight current industry problems with regard to the City Deep inland container depot. Respondents were also asked to indicate the volume of goods that were channelled through the VICD. A series of dichotomous questions were asked in this regard.

5.4.2.1 Size of the undertaking

In Figure 5.15, the relative size of the business activities of respondents is analysed. Of the total number of respondents, 60% are medium-sized enterprises, with 40% indicating that they are a large enterprise. Due to the fact that the size of the undertaking was determined by weight of goods forwarded and that the average weight of goods shipped in the last year for all respondents was 8 482.7 tons, there are no small enterprises in the sample (Viljoen, 2006b).

Figure 5.15: Size of the freight forwarder undertaking

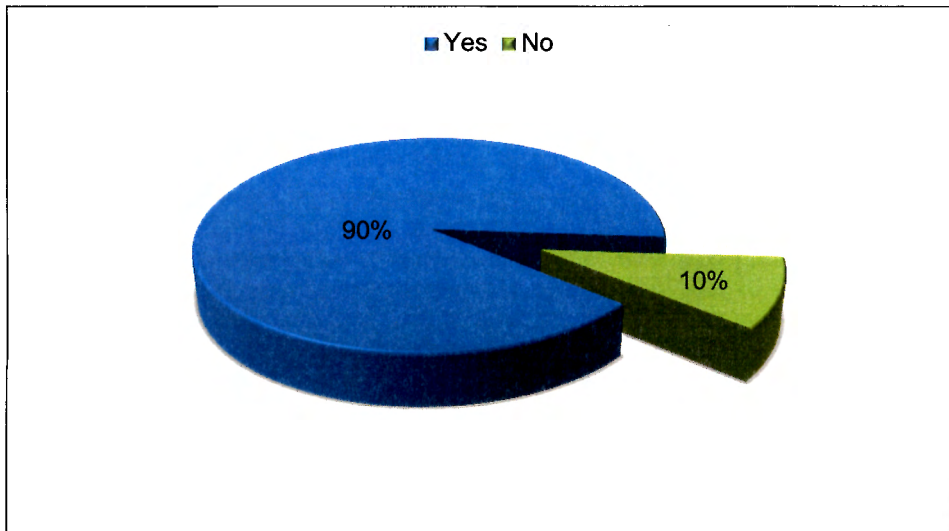


Source: Viljoen (2006b)

5.4.2.2 The existence of problems at City Deep

This section was included in order to determine whether or not constraints exist in the industry, and if so, what are the causes of these constraints. Respondents also had to indicate whether or not they believed that these problems would continue. If the proposed VICD were established, its direct competition would be City Deep and Tambo Springs.

Figure 5.16: Do you experience any problems at City Deep?



Source: Viljoen (2006b)

As illustrated in Figure 5.16, 90% of respondents believe that constraints do exist in the industry. Most respondents named long waiting periods, capacity and administrative constraints at City Deep as the causes of problems within the industry. Equipment failure was also noted by 20% of the respondents as the cause of the congestion at City Deep (Viljoen, 2006b). When asked if the problems at City Deep were expected to continue, 70% of respondents indicated yes. This is illustrated in Figure 5.17.

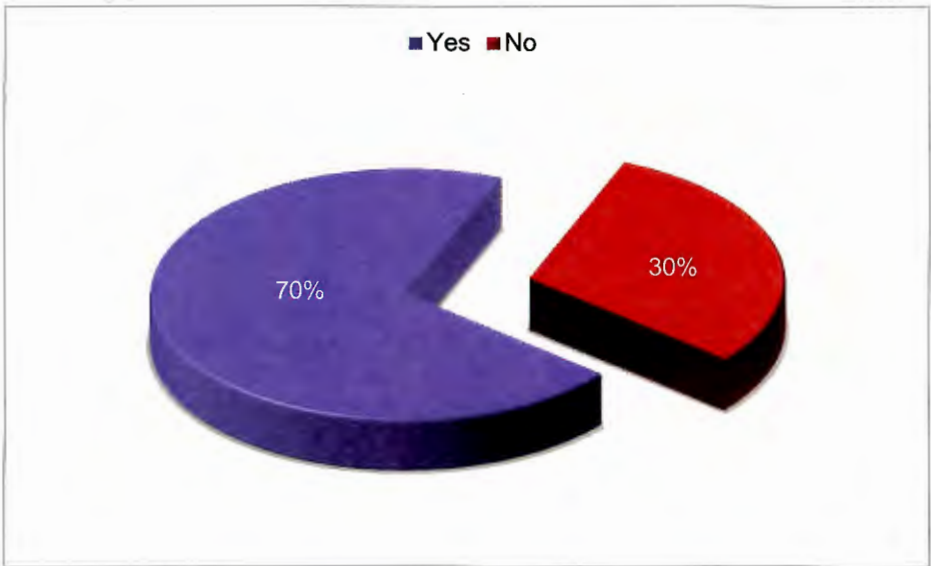
5.4.2.3 Preference of respondents

As part of the freight forwarder questionnaire, respondents were asked to state their preference with regard to certain questions. Along with these questions, the respondents had to indicate the volume of goods that they would channel through the VICD.

5.4.2.3.1 Level of usage of the VICD

All respondents indicated that they would make use of the proposed VICD that would be linked to an international cargo airport. On average, the respondents are willing to channel 36% of their products through the VICD. This is illustrated in Figure 5.18.

Figure 5.17: Do you expect the problems at City Deep to increase?



Source: Viljoen (2006b)

Figure 5.18: Would you make use of the VICD?



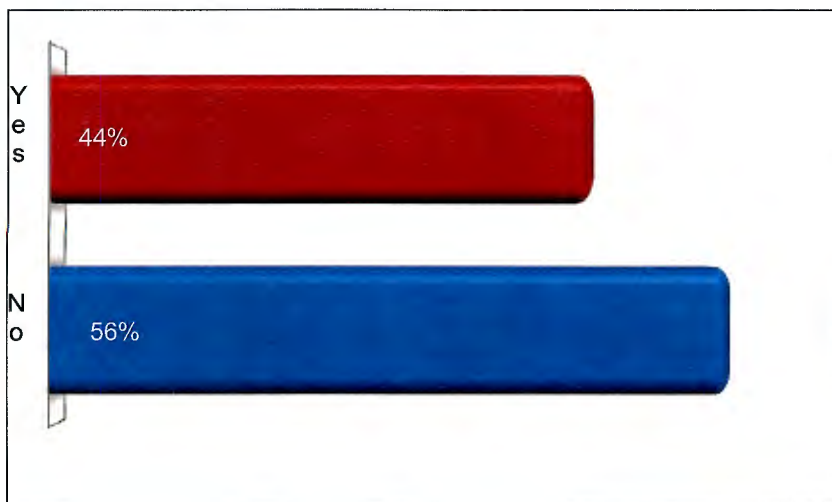
Source: Viljoen (2006b)

5.4.2.3.2 Administrative benefits of the VICD

Since one of the major constraints, indicated by respondents, to exist at City Deep is administrative congestion all respondents agreed that if the VICD was less administratively congested then they would make use of its facilities. On average 44% (which is the highest average recorded of goods that respondents

are willing to channel through the VICD) forwarded by the respondents would be forwarded through the VICD (as seen in Figure 5.19).

Figure 5.19: If there is less administrative constraints would you make use of the VICD?



Source: Viljoen (2006b)

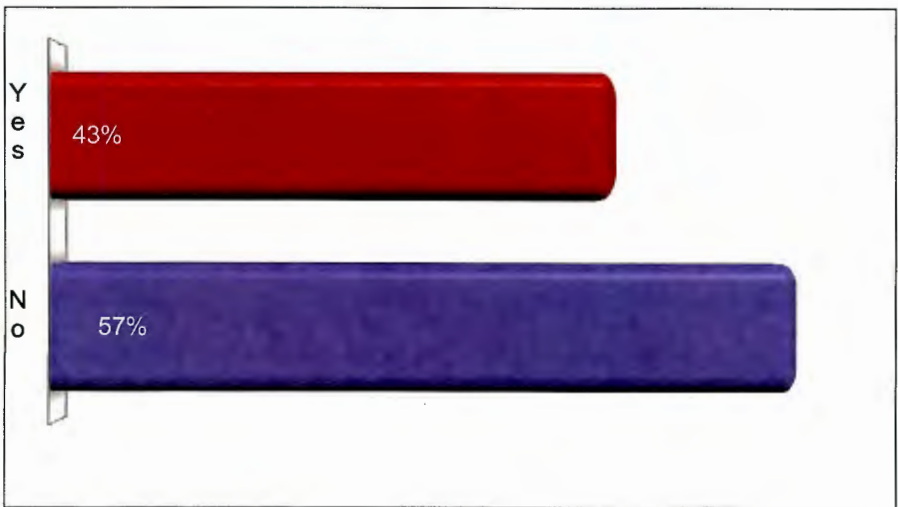
5.4.2.3.3 Cost advantages of the VICD

As illustrated in Figure 5.20, respondents indicated that they were willing to channel 43% of their products through the VICD if it had a lower cost structure. All respondents would make use of the VICD if a lower fee structure was in place.

5.4.2.3.4 If the Vaal region does not have enough origin/destination demand, would you still make use of the VICD?

Here, 90% of respondents indicated that they would still make use of the VICD. This is because the constraints experienced by the respondents at City Deep would still exist, thus despite the lack of origin/destination demand the VICD would still be a better alternative. This is illustrated in Figure 5.21.

Figure 5.20: If the VICD rendered the same services as City Deep but at a lower fee structure would you make use of its facilities?



Source: Viljoen (2006b)

Figure 5.21: If the Vaal region does not have enough origin/destination demand, would you still make use of the VICD?



Source: Viljoen (2006b)

5.4.3 Industry leader survey: an interview with Arcelor Mittal South Africa

In order to gain better insight into the opinion of the industry leader within the Vaal region, namely the steel industry, an interview was conducted with the logistical manager of Mittal Steel in Vanderbijlpark, Mr. Koos Fourie in 2009.

According to Fourie (2009) several constraints exist within the steel industry. Due to the high cost of plant start-up (in the case of Mittal Steel, R80 000 000) it is not very prudent to expand or relocate production activities unless proper analysis of the feasibility of the project has been determined.

Mittal Steel is primarily concerned with producing for the local market as the global steel industry is highly competitive and South Africa would not be amongst the suppliers with the lowest cost per unit. This would impact heavily on the economy of the Vaal region if exporting steel products was the major thrust of Mittal's operations. Should the local demand for the 200 000 tons of steel produced by Mittal be overestimated then the only recourse for the industry leader is to consider exportation of the surplus stock. However, neighbouring states in Africa take precedent over international destinations (Fourie, 2009).

Economic conditions would also play a role in this decision process. If the local and African markets are under economic constraints then Mittal would consider exporting across African borders. The international price for steel would then be a deciding factor. If the price offered for the surplus is far too low to compensate the company adequately then the goods would merely be stockpiled and output would be decreased until such time as local demand takes off once again (Fourie, 2009).

According to Fourie (2009) another prohibiting factor is the possible storage of the surplus. Mittal steel is currently involved in an agreement with City Deep Container Depot with regard to the storage of stock that requires transportation to the necessary end users. However, due to the large size of the steel undertaking and the definite impact of low domestic demand, Mittal may not always be able to fulfil the minimum volume that is required by the agreement. Should the demand for steel slack off, the company would often have to pay for storage space that is not utilised at all, thereby increasing the cost of production and lowering the productive capacity of the enterprise.

Adequate transport infrastructure is a determining factor of production. According to Fourie (2009) production is often planned according to the amount

of available rail trucks at the company's disposal. For this reason, the warehouse must be in a state of constant export-readiness in order to fulfil orders expediently. Often, Mittal would have to dispatch the order well in advance in order to meet the order delivery deadline.

Mittal Steel, despite its somewhat adverse stance to exportation of goods, provides assistance to those customers that do export their products. An export rebate is offered to these undertakings, which is based on the value that is added to the steel through their production processes. The higher the added value, the higher the rebate received. However, Fourie (2009) states that this facility is often not utilised by local manufacturers within the Vaal area as it is far too costly for these small undertakings to export to international destinations.

The Vaal Logistical Hub would be the perfect solution for the industry constraints mentioned above. The proposed project would be providing downstream industries in the location of Mittal Steel's main plant which in turn negates the need for relocation in order to take advantage of the industrial cluster. With a container depot so close to the main plant, Mittal can experience cost savings with regard to storage and delivery of manufactured products. The supply chain can be shortened which would alleviate the stress of meeting orders well in advance.

The international cargo airport would provide a more efficient mode of transportation to African destinations and domestic destinations that would otherwise take a few days for delivery. Being the leading undertaking within the industry cluster, would afford Mittal the opportunity of packages tailored made to suite their requirements.

By combining the export rebate offered to small industries and the close proximity of a portal to international destinations, small businesses within the Vaal region would flourish with the expanded market opportunities. A partnership between the various local role-players would be a prudent requirement when developing the proposed VLH.

5.5 SUMMARY AND CONCLUSIONS

A nation's ability to increase the welfare of its citizens is dependent on its ability to increase capital investment, labour productivity and the increased competitiveness of its key industries. In order to this, the infrastructure available to the economic participants of a nation must be efficient and productive in order to enable sustainable growth within the region concerned.

Transport infrastructure, in particular, is seen as one of the most important catalysts for growth and ensures regional, national and international integration. An efficient transport system ensures enhanced market accessibility, enhanced competitiveness, increased job creation and endogenous investment within the region. In order to ensure these outcomes and the upliftment of its impoverished citizens, South Africa must improve its underutilised and inefficient transport networks.

The economic impacts of transport infrastructure should be considered as a direct or indirect impact that takes place at the macro or microeconomic level. The direct impact relates to changes in accessibility whereas the indirect impact relates to the multiplier effects that can be felt across various industries as a result of the enhanced transport infrastructure. At the macroeconomic level, transport is essential for the mobility of the economy, while at the microeconomic level; transport ensures that certain industries are mobile enough to link with all consumers, producers and products in the value chain.

The transport system within a country supports the transition from a manufacturing to a service-driven economy and contributes to the overall GDP of a country. Road and rail (41.5%), as well as supporting land transport activities (33.5%) form the largest components of transport's contribution to the GDP of South Africa as of 2002. Logistics is also one of the largest cost components for the primary and secondary sectors of the economy with 47% and 58% being recorded in 2008 respectively.

The relationship between transport and economic development is crucial to a country. As transport infrastructure becomes more efficient and reaches higher

levels of investment, increased capacity, efficiency and reliability occurs. This creates time and cost savings for the industries within the region due to shortened value chains. These productivity gains are transferred to increased competitiveness which would ultimately increase economic growth. This would ensure that regions which have the greatest potential for growth within a country reap the benefits of expanded market opportunities.

Gauteng remains South Africa's main industrial hub and contributes 33.9% to the overall GDP of the country (as of 2010). Two of the most important freight corridors in the country, namely the Gauteng – Durban (N3) and Gauteng – Cape Town (N1) corridors intersect within the province. Both corridors are expected to increase capacity by 38% and 40% respectively by 2020. This growth cannot be supported by the existing infrastructure. The Moving South Africa survey concluded that the South African freight system must enhance the capacity of corridors through the creation of economies of scale and increased integration between the various modes of transport in order to take advantage of this potential growth. The VLH would be in a prime position to utilise the excess potential capacity and underutilised transport infrastructure of both these corridors.

A logistical hub is seen as a means of both multimodal and intermodal transportation that overcomes the economic and social challenges present within a region. Improved accessibility to markets, enhanced reliability, reduced transport costs, economies of scale, enhanced efficiency and production capacity are a few of the potential benefits that would accrue as a result of the establishment of the VLH. By taking the economic impact of other similar projects into account, then it can be assumed that the VLH would have similar results should it be implemented in the Vaal region. Of the examples given, Tambo Springs was used as a yardstick with which to measure the outcome of the establishment of the VLH. On average, it can be expected that the VLH would create between 28 000 and 42 000 direct jobs (those relating to the actual VLH) while 9 000 to 14 000 jobs would be created from the downstream activities located in the VIDZ. It can be further estimated that approximately R 1

billion in investment would be created within the Vaal region as a result of the project.

In order to further highlight the need for an LED project within the Vaal and to promote the establishment of PPPs, an industry survey was conducted within the Vaal region. Of the goods produced within the region, 73.7% has South Africa as point of origin, while 70.1% has South Africa as the final destination. The Vaal region has the highest percentage as a destination for goods produced within the region. Road is the mode of choice for good delivered to (53%) and procured within (56%) the Vaal. An average of 42% of the goods produced in the Vaal is containerised, which would ensure the use of the VICD.

Of those industries that took part in the survey, 51.2% take part in secondary economic sector activities while only 3.6% are primary industries. The majority (68%) of undertakings within the region are small undertakings, 22.7% are medium-sized enterprises and 9.3% are small undertakings. The industries most likely to make use of the VLH are those that are medium to large undertakings in the secondary sector. However, small industries cannot be discounted as the majority of downstream activities that would relocate to the VLH would be small in nature. This clearly indicates that there is a viable market for the establishment of the VLH.

The respondents that were surveyed indicated that they would participate in the activities of the VLH and fully support its establishment in the Vaal region. The most positive responses from respondents were with regard to higher levels of job creation, higher business confidence and industrial development that would result from the establishment of the VLH. Respondents had indicated that the VIDZ would bring about an increase in the diversification of production activities (79% of respondents), while 85% indicated that the project would eventually increase the GGP of the Vaal region and 80% indicated a reduction in poverty within the Vaal.

As industries within the region are not the only undertakings that would be making use of the VLH, freight forwarders (who would make use of the VIA and VICD) within the region were surveyed in order to determine current industry

constraints and to test the feasibility of the VLH. Of the respondents, 90% indicated that capacity constraints exist at City Deep. Administrative complaints and equipment failure were cited as the most common causes of delays.

Of the respondents, 64% indicated that they would make use of the VICD. Should there be less administrative constraints, 44% indicated that they would channel goods through the VICD, with 43% indicated that they would do the same if a lower fee structure was in place. Of the respondents, 90% indicated that they would still make use of the VICD even if there was not enough origin/destination demand as the project would still not be operating under the same constraints as City Deep.

An interview was conducted with Arcelor Mittal's logistical manager to determine the feasibility of the VLH from the perspective of one of the lead firms within the region. As indicated, the unit price for steel in South Africa is amongst the highest globally due to the high cost of transporting the goods to the international market. Should the VLH ensure a lower cost per unit this would assist the industry in becoming more internationally competitive. Mittal also offers an incentive to customers that do export their products. This export rebate ensures the lower cost per unit needed by competitive firms.

Any storage facility would have to be in a constant state of export-readiness as Mittal often dispatches orders well in advance to meet delivery deadlines. Storage space would also have to be available at a discount as the amount of stock needed is determined by global demand, which may slack off resulting in lower inventory quantities needed. As the VLH would be able to offer these facilities to Mittal Steel, there is a clear need for the establishment of the project.