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CASE STUDY OF TRANSPORT, STORAGE AND COMMUNICATION PROFESSIONALS

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Case Study of Transport, Storage and Communications Professionals

Report

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CHAPTER 1

This chapter provides an overview of the transport sector, explains the purpose of this study and the structure of remaining chapters.

INTRODUCTION: OVERVIEW OF THE TRANSPORT SECTOR

In his budget speech delivered on 27 March 2007, the Minister of Transport, Mr. Jeff Radebe, indicated that prioritized areas of scarce skills include engineering, technical skills, traffic police men and women and public transport operators.

During a conference, held on 9 July 2007, on the implementation of transport policy, strategy, and technology application for all modes of transport, the Minister again referred to the shortage of skills when he said: "The shortage of skills in the transport sector is a huge problem as it hampers the implementation of policy".

Some of the reasons for the skills shortage are noted as the "brain drain", previous education inequalities, global mobility of the modern work force, job hopping and a high turnover rate of especially public officials.

In the same address, Mr. Radebe noted the positive contribution that new pieces of legislation, introduced within the new democracy, had on economic development and growth over the past decade. Some of these are:

- The recognition of the important role that women and youth play in public and private life;
- The smoothing of the democratic state into the family of nations from which it had been isolated;
- The creation of a socially cohesive regime, that would bring together communities that had been systematically separated;
- The response to global challenges, such as environmental degradation, work force mobility and competition;
- The creation of an economic dispensation that catered for all of people, rich and poor, young and old, able and disabled; and
- The narrowing of the gaps between rural and urban populations.

There is a need for a constant stream of talent into the transport sector to sustain the diverse skills requirements and the momentum of economic growth. The transport sector is widely considered to be the life blood of the country. Currently, the sector employs approximately 500 000 employees, both formal and informal, that provide for the infrastructure and movement of people and goods within and out of the country by air, road, rail, sea and pipeline ensuring a safe and reliable transport service that enhances business growth. The capacity of these people to

operate technology and manage resources efficiently impacts on South Africa's ability to be globally competitive. In addition, there is a growing need for the integration of different modes of transport as well as for improved supply chain logistics and the inherent skills needed to effectively and efficiently ensure that resources and commodities reach destinations quickly, safely and in an economic manner.

In an address earlier in 2007, the then Chairperson of the Transport Education and Training Authority, Mr. Bothma referred to several highlights, trends, developments and achievements happening presently in the transport sector, some of which are noted below.

In the run-up to 2010, transport infrastructure is being upgraded and developed, which leads to a need for skills in transport operations and support functions.

The aerospace industry has identified the areas of passenger handling, aircrew (pilots), ground crew, technical and support services.

In the forwarding and clearing sector, supply chain managers, project managers, customs officers and data analysts are in high demand, whilst with growing foreign trade South Africa's ports of entry are bursting with freight. This is increasing the need for technical skills in lifting machinery operators, warehousing and distribution, performance management, electronic technicians and port management.

In the maritime sector, leadership and management capacity as well as navigation skills, engineering skills and fishing technologies are in short supply.

Changes in the railway sector together with the Gautrain and its demand on new technological skills, the maintenance of rolling stock as well as the technological upgrades on railway lines requires skills in rail track maintenance, rail traffic management, train driving, coach repairs and related information technology skills.

Road freight operators are responsible for transporting raw materials and goods from producers to consumers. With an expected increase in consumption and construction, comes the need for freight managers, drivers, porters, loaders, packers and dangerous goods handling.

Bus operators foresee an increase in the number of passengers with the anticipated growth in the industry and are seeking people with skills in information technology, transport logistics management and fleet maintenance.

The growth in and formalization of the taxi industry, brought requirements for skills in basic business administration, customer care, professional driving, first aid, and vehicles maintenance.

OBJECTIVE OF THIS STUDY

A range of sources are signaling occupations in which there is a scarcity of qualified and experienced people, which are portrayed as critical to help the economy grow and/or create job opportunities at a higher rate. In most cases these signals prove to be valid, however, some of the messages regarding scarce skills are doubted on methodological grounds. Indicators of skills shortages may mask many other problems related to labour market imperfections which are exacerbated by the highly specialised nature of certain jobs. Employers might seek specific combinations of skill sets which may not be readily found in many otherwise qualified job-seekers. Other problems include inadequate recruitment practices, uncertainty related to temporary work, lack of labour force mobility (i.e. urban vs. rural preference) and differences in remuneration.

An understanding of the reasons for perceived skills shortages help to determine the appropriate measures needed to alleviate these shortages. For example, with regards to genuine skill shortages or absolute scarcity, supply side policy responses might include increases in education levels and adjustments to skilled migration targets and policies. As there is a delay between the start of new education and any addition to supply, immigration responses need to perhaps take precedence in the short term. Other demand side measures to address some of the issues associated with recruitment and retention or relative scarcity for instance include increasing pay scales or providing incentives e.g. to work in rural areas.

The Department of Labour entered into a research contract with the Human Sciences Resource Council (HSRC) in June 2006 to undertake six major studies on differing aspects of skills development for the DoL over a two-year period between 2006 and 2008.

This study constitutes part of the study on “Research on Identification of scarce and critical skills”. The main objective of the study is to identify, collate, interpret and verify information on scarce and critical skills impacting on the South African labour market, with a specific focus on the transport professionals related occupational categories as an “occupational family” depicted in the Master List of Scarce and Critical Skills published in August 2006.

The transport professionals’ occupational family as per the published list includes:

- Air transport professionals, including pilots, air traffic controllers, marine transport professionals, e.g. ship's master, ship's engineer, port engineers and ROV (remotely operated vehicles) pilot; and
- Transport managers, including freight managers, transport managers, transport operators / owner managers.

The study primarily takes on a transport industry perspective due to methodological challenges as explained in Chapter 2, to present case studies pertaining to selected transport related professional occupations in South Africa.

Contributions of this study are to conceive of labour demand and supply in a more detailed fashion and to determine emerging transport related occupational trends with a primary focus on professional and managerial occupational categories for the period 1996 to 2005. This is accomplished by taking account of movements in employment levels according to different transport professions and skills levels, as well as by a select set of demographical characteristics such as race, gender and age and also geographic distribution by province, which lends more credibility and indeed more sensitivity to the analysis.

The study also presents views on future skills shortages as well as the relationship between transport professions shortages and the effectiveness of labour market processes and institutions to accommodate and address these shortages.

The following specific questions are examined and debated – with reference to their effect on the shortage in the supply of transport professions:

1. Who says that there is a shortage of *Transport Profession* in South Africa?
2. Is there actually a shortage?
3. How is this shortage quantified?
4. What do the available data indicate (e.g. demand data, supply data, vacancy data, and other sources)?
5. What is the extent of the shortage (e.g. demographics, professional body registrations, Labour Force Survey data, annual Higher Education and Training (HET) output, public sector proportion and distribution, etc.)?
6. What is the extent of demand (e.g. vacancy data, replacement demand requirements, proposed norms where applicable, specific policy requirements, anticipated changes in the requirements for *Profession*, etc.)?
7. What are the reasons for a shortage (e.g. supply side factors like education, registration, etc., demand side factors like policy, social conditions in the country, etc., demand/supply mismatch factors, working conditions and salaries, migration, demographic considerations leading to relative shortages, etc.)?
8. What will the national, social, economic, etc. impact be if shortages are not addressed in the medium and/or long-term?

9. What has already been done to try to alleviate shortages?
10. What is on the cards for implementation?
11. What effects are these measures likely to have?
12. What still needs to be done?

LAYOUT OF THIS STUDY

Chapter 2 provides an overview of the methodology and approach followed to demarcate transport professionals for purposes of this study as well as methodological challenges encountered.

Chapter 3 presents a review of available literature, national and other reports and secondary data sources including published media reports, articles and press releases to determine present views on shortages of skills and ways in which it is quantified.

Chapter 4 presents a statistical analysis of raw data available from Statistics South Africa (StatsSA), and other databases to determine what the actual shortages are and what the demand for transport professionals looked like over the past decade.

Chapter 5 presents a statistical analysis of raw data available from HEMIS and other databases to determine what the actual supply of transport professionals looked like over the past decade.

Chapter 6 summarizes the national, social and economic impact in the medium and long term in the face of transport professions shortages not being addressed in a timely and constructive manner, taking cognizance of known current and planned initiatives to address such shortages as well as cross-sector, international and other influences that need to be considered.

Chapter 7 summarizes the study's key findings and recommendations.

CHAPTER 2

This chapter provides an overview of the methodology and approach followed to demarcate transport professionals and discusses the methodological challenges encountered.

OUTLINE OF METHODOLOGY

Secondary literature review

A desktop review was conducted of national and international literature, labour market studies, as well as media and newspaper articles relevant to the transport sector and transport related occupations to obtain an understanding of:

1. past, present and projected labour market trends and needs;
2. the nature and scope of multi-industry and cross-sector transport professionals;
3. market perspectives of transport professions shortages and reasons therefore;
4. past and present professions related employment trends relevant to the transport sector;
5. trends relevant to sector and transport professions related training and development; and
6. stakeholders and role-players in die transport professions environment.

Regulatory framework and policy review

A review was also conducted of relevant transport sector and labour market related policy, legislation and regulations, reports and formal statements emanating from related government departments and related statutory bodies to gain a sense of present trends, initiatives and priority focus areas pertaining to the demand and supply of skills in the country. These included documents and information published by and/or pertaining to:

1. The Department of Transport (DoT)
2. The Department of Labour (DoL)
3. The Department of Trade and Industry (DTI)
4. The Department of Home Affairs (DHA)
5. The Joint Initiative on Priority Skills Acquisition (Jipsa)
6. The Accelerated Growth Initiative of South Africa (AsgiSA)
7. The National Skills Development Strategy 2005-2010 (DoL)
8. National Industrial Policy Framework, August 2007 (DTI)

Survey of transport sector related organisations

A questionnaire was developed to test the transport sector's perspective on labour market factors such as supply and demand, present and future perspectives relevant to transport occupations, including professionals, as well as skills requirements in general. The questionnaire was circulated to a sample of 47 organisations either operating within or regulating the transport, storage and communications industry or with a supply chain business unit. The sample of 47 entities was randomly selected.

Modus operandi included telephone calls to organisations to confirm contact details and names of relevant staff that could assist with information. The latter was then contacted to arrange for electronic delivery of the questionnaire via e-mail.

The initial response rate was extremely poor and only 4 completed questionnaires were received back (9% of sample). Refer to Appendix 2 for details of the sample selected and indications of responses received.

Reasons for the lack of a willingness to participate that most of the organisations which were selected as part of the sample, put forward, included amongst others a lack of capacity.

A decision was made to change the initial approach and request selected occupational and market related information in a general email format. The remaining organisations were once again contacted to explain the change in approach and between four and eight follow-up calls were subsequently made to determine progress with the supply of information.

The response to the second approach was also poor with 10 organisations submitting information (21%).

The distribution of the sample and response rate is reflected in Table 2.1.

Transport related sub-sector (including associations)	Number of organizations in sample	Portion of sample	Responses received (number)
Air	4	9%	3
Land	14	30%	4
Rail	4	9%	1
Aquatic	6	13%	1
Pipelines	1	2%	
Storage	1	2%	
Communications	3	6%	
Inter/Multi modal	11	23%	5

Other	3	6%	
Total	47	100%	14 (30% of sample)

Statistical review

Statistics pertaining to employment trends, educational trends and demand and supply related information was reviewed and analysed. The following code lists, statistical information and databases were used to demarcate transport professionals and obtain transport occupation related information for further analysis and interpretation:

1. South African Standard Classification of Occupations (SASCO) / Standard Occupational Classification (SOC), used by StatsSA
2. Organisational Framework of Occupations (OFO), used by Sector Education and Training Authorities and AsgiSA
3. Standard Industrial Classification Codes (SIC), used by StatsSA and the Sector Education and Training Authorities (SETA's)
4. South African Qualifications Authority (SAQA) fields of training
5. National Qualifications Framework (NQF) skills levels
6. Labour Force Surveys (LFS) for 2000 to 2006 based on SASCO and SIC codes
7. October Household Surveys (OHS) for 1996 to 1999 based on SASCO and SIC codes
8. Annual Higher Education and Training (HET) output based on first and second order Classification of Education Subject Matter (CESM) codes
9. Further Education and Training (FET) instructional offerings
10. DoL vacancy database (vacancies captured for the period April 2004 to March 2007)
11. Registration criteria of relevant professional bodies
12. StatsSA database – various documents and statistical information
13. Government skills/vacancy project 2005/6 data
14. SETA Sector Skills Plans (SSP's)

METHODOLOGICAL CHALLENGES

As yet (at least to the authors' knowledge), there has been no comprehensive study on the nature and scope of transport professionals and related occupations and the supply and demand for these occupations in the South African labour market. In order to construct a meaningful analysis of employment trends relating to transport professionals, it is necessary to identify in which economic sectors and occupational categories these occupations manifests themselves. This proved to be problematic at both occupation and sector levels. Demarcating transport professionals is complicated by a number of factors.

Firstly, raw data extracted from the OHS and the LFS, both surveys by StatsSA, proved to be incomplete with many cells reflecting missing values. The data was, however, used for purposes of this report as it does, notwithstanding missing values, provide insight into demand related trends between 1996 and 2005.

Secondly, commonly accepted and standardised job titles for defining transport occupations do not exist on a sector level. Many job titles are used within organisations to describe and name similar jobs.

Thirdly, not all of those working in for instance the engineering field in the transport industry represent transport professionals. Whilst it is important to measure transport professions related occupations in the transport, storage and communications industry, it is also important to measure transport professions related occupations across industries. Because of the reasons explained below, the focus was placed on the transport, storage and communications industry specifically for purposes of this study.

In addition, the OHS and LFS, which provided most of the labour force data used for analysis purposes during this study, use the SASCO coding system, which provides for ten occupational categories. The SSP's on the other hand, as well as the Master Scarce Skills List which has been based on the SSP's, are coded according to the OFO, the format prescribed by the DoL. The OFO, adopted by the DoL as a tool for identifying, reporting and monitoring scarce and critical skills, group occupations based on similarity of skills specialization and skill level. This framework makes provision for eight broad occupational categories.

Taking transport occupations in the "professionals" category on both coding systems as an example, it becomes clear that available data extracted from the OHS and LFS cannot be compared with scarce and critical skills reflected in SSP's as the coding systems do not provide for the same occupational categories on a more detailed level. The SASCO system identifies three main categories applicable to this study, namely (a) Legislators, senior officials and managers, (b) Professionals and (c) Technicians and Associate Professionals. On the other hand, the OFO identifies only two categories, namely (a) Managers and (b) Professionals, whilst grouping Technicians with Trades Workers as a separate category.

Also, transport professions related occupations can only be accurately demarcated and perhaps compared on a one-on-one basis if data was available on a six-digit level regarding the OFO (SSP's) and on a four-digit level regarding SASCO (OHO and LFS). Data in both instances gets contaminated with other occupations which are not transport specific once figures are extracted on, for instance, a three or four-digit level.

As a result of the lack of clear occupational categories and definitions specifically applicable to transport professionals, the SIC was used to provide guidance regarding the activities considered to be transport specific and this the information supplied in this study is primarily transport, storage and communications industry related.

According to the SIC classification, the transport industry is generally considered to include divisions involved in activities related to providing passenger or freight transport, whether scheduled or not, by rail, road, water or air and auxiliary activities such as terminal and parking facilities, cargo handling and storage. The industry also includes postal activities and telecommunications as well as the renting of transport equipment with a driver or operator for the different transport modes. General exclusions are the transport of a firm's own products/goods (conducted as an ancillary service), the maintenance, repair and alteration of transport equipment, motor vehicles and motor cycles as well as the construction, maintenance and repair of roads, railways, harbours, air fields, etc. Also excluded are the renting of transport equipment without a driver or operator and recreational transport activities, such as the operation of cableways for recreation purposes.

These guidelines were used to identify relevant SASCO codes for the purposes of extraction of transport professions related information. It needs to be noted, however, that because data was extracted on a three-digit level, it will include other professions related occupational data which is not applicable to transport specific professions only.

This study does not attempt to operationalize demarcation of transport professionals. A more detailed study will have to be undertaken, which will need to address various ways of categorising and estimating transport professionals on a multi-industry and cross-sector basis.

SPECIFIC OCCUPATIONAL FOCUS OF THIS STUDY

Wikipedia (an internet-based encyclopedia) provides the following definitions: "A *profession* is a specialized work function within society, generally performed by a professional. A "*professional*" works to receive payment for an activity (as a profession) which usually requires expertise and carries with it socially significant mores and folkways. That is to say, behaving professionally would indicate that the person's actions remain in accordance with specific rules, written or unwritten, pertaining to behavior, dress, speech, etc. By extension, the adjective professional can indicate that someone has great expertise or skill in a craft or activity".

Wordnet (Princeton's web-based dictionary) describes a *profession* as "an occupation requiring special education" and a *professional* as "a person engaged in one of the learned professions".

These definitions, together with the specific project brief provided initially by the DoL, and taking into consideration SASCO and OFO coding as well as the references made to transport professionals in the Master Scarce Skills List, were used as the departure point for demarcating transport professionals for purposes of this study.

The occupational categories selected for the study include:

1. SASCO / SOC:
 - a. Code 1: Legislators, senior officials and managers
 - b. Code 2: Professionals
 - c. Code 3: Technicians and associate professionals
2. OFO:
 - a. Code 1: Managers
 - b. Code 2: Professionals
3. SAQA field of training:
 - a. Code 03: Manufacturing, engineering and technology
 - b. Code 10: Physical, mathematical, computer and life sciences
 - c. Code 11: Services
4. CESM – University and Technicon (Universities of Technology) Supply
 - a. Code 08 : Engineering and Engineering Technology
 - i. Code 0801 : Aerospace & Aeronautical Engineering and Technology
 - ii. Code 0802 : Agricultural Engineering and Technology
 - iii. Code 0803 : Automotive Engineering and Technology
 - iv. Code 0805 : Chemical Engineering and Technology
 - v. Code 0806 : Civil Engineering and Technology
 - vi. Code 0809 : Graphics and Drafting for Engineering and Technology
 - vii. Code 0810 : Engineering Mechanics
 - viii. Code 0811 : Engineering Science
 - ix. Code 0812 : Environmental Engineering and Technology
 - x. Code 0817 : Marine Engineering and Naval Architecture
 - xi. Code 0819 : Mechanical Engineering and Technology
 - xii. Code 0823 : Ocean Engineering
 - xiii. Code 0824 : Petroleum Engineering
 - xiv. Code 0825 : Surveying and Mapping
 - b. Code 11 : Industrial Arts, Trades and Technology
 - i. Code 1106 : Transportation

OVERLAP WITH OTHER STUDIES

Several other occupational studies are being executed as part of the same broader project. Occupational studies, with which this study will overlap to varying degrees, include:

1. Engineering profession – an overlap will occur relevant to transport engineers and related engineering occupations.
2. Managers (specialization – critical skills focus) – an overlap will occur as far as transport managers form part of data extraction on SASCO and OFO codes.
3. Artisans / Trades an overlap will occur as a result of the OFO and SASCO classification of Technicians explained earlier.

TIMEFRAME OF THIS STUDY

The study analyses the state of transport occupations between 1996 and 2005, but depending on the quality and availability of specific data for this period, some information has been presented for a shorter or longer timeframe.

SUMMARY

This chapter focused on the nature and scope of this study, the methodology constructed for purposes of conducting the study in an organized manner and also reflected on several constraints and limitations which had to be pondered in the course of execution.

The methodology comprised primarily a literature review, the completion of a questionnaire by roleplayers in the transport industry and analysis and interpretation of data obtained from several databases.

Methodological challenges included different coding systems used, the lack of standardisation regarding job titles in the marketplace, incompleteness of data, etc. In addition, the scope of transport professionals had to be demarcated to compensate for the above.

CHAPTER 3

This chapter presents a review of available literature, reports and secondary sources of information.

INTRODUCTION

Transport is often considered to be the engine of growth and a guarantor of national integration on an internal and external global economic basis. The industry employs many people globally and in South Africa, accounts for a substantial number of jobs in the national economy, and has supplier industries and customers of its own (DoT, Moving South Africa, 2006).

Transport is also an enabling industry by meeting other national and social objectives. Examples of such non-transport specific objectives include economic growth, creating a high and rising standard of living for all citizens, increased trade, especially with neighbouring countries, improved access to employment opportunities and increased social integration.

Transport, therefore, becomes a critical input for other industries and other social objectives set outside of the transport context. In line with this, it is then also critical for the transport industry to employ sufficiently skilled people to successfully meet its objectives on an industry, national economy and global basis.

This chapter seeks to present views existing amongst a range of role players and stakeholders pertaining to the delivery of transport in the country and the related, much debated, shortage of skills and specifically relative to transport professionals. Several sources provide insight into the skills shortage, amongst them DoL's National Master Scarce Skills List and DHA quotas as well as a variety of secondary data sources, which includes information gained from articles published in the press, opinions expressed in the media and through organizational commentary; etc.

NATIONAL SCARCE SKILLS LIST (ASGISA ALIGNED) 2006

Although the skills shortage debate started long before, it has only now been collectively quantified to a certain extent through the first National Master Scarce Skills List for South Africa, which was published on 8 August 2006. The list provides a comprehensive account of the skills that are most needed in South Africa and which place a constraint on economic growth and development.

Before the list could be compiled, role players had to adopt a clear definition for Scarce and Critical Skills. The definition was initially drafted and developed

between the DoL and its skills development sectoral intermediaries, the SETA's, who then negotiated and amended it with relevant line departments in the Skills committee of the government's economic cluster, i.e. the DoL and the Departments of Education (DoE), Home Affairs (DHA), Public Enterprises (DPE), Science & Technology (DST), and Trade & Industry (DTI). In addition, the DoL also had to adopt the OFO which SETA's have utilized in the drafting of their 5 Year SSP's.

The National Scarce Skills List was prepared by the DoL drawing relevant data from SETA SSP's as well as contributions received from several other government departments, including Home Affairs and the Departments of Trade and Industry, Public Enterprises and Science and Technology. The DoL used additional data obtained from other government departments to primarily validate the scarcities identified in the SETA SSP's.

The DoL is currently in the process of updating this first list based on SETA's SSP updates.

The Master Scarce Skills List for South Africa reflected the following transport specific professions. The table includes those major "families" of occupation which refer *specifically* to "transport professions" as well as transport related "management professions".

Table 3.1: Master Scarce Skills List for South Africa: Transport Occupational Families				
Generic Occupation	Specialisation	OFO code	Occupational description	Number TETA
Managers				
Chief executives and General Manager	Corporate General Manager (including very senior managers)	111201	Plans, organizes, directs, controls and reviews the day-to-day operations and major functions of a commercial, industrial, governmental, local authority or other organization through departmental managers and subordinate executives.	175
Business Administration Manager	Corporate Service Manager (Admin. & Business)	132101	Plans, organizes, directs, controls and coordinates the overall administration of an organization.	500
Business Administration Managers	Finance Manager	132201	Plans, organizes, directs, controls and coordinates the financial and accounting activities within an organization.	40
	Human Resources Managers	132301	Plans, organizes, directs, controls and coordinates activities concerned with staff selection, training and development, conditions of employment and other human resource issues within organizations.	65
Construction, Distribution and Production/Operations Managers	Supply & Distribution Managers	133601	Plans, administers and reviews the supply, storage and distribution of equipment, materials and goods used and produced by an organization, enterprise or business	130
	Production/Operations Managers	1335	Plans, organizes, directs, controls and coordinates the production activities of forestry, manufacturing and mining organizations including physical and human resources	205
Small Business, Office, Programme and Project Managers	Programme and Project Managers • Technical Project & Contract Managers	136101	Plans, organizes, directs, controls and coordinates the contractual arrangements related to the implementation of programmes and projects	30
	Small Business Managers	136201	Plans, organize and manage the functions and resources of a small business such as administrative and operating systems and office personnel	50
Miscellaneous Hospitality, Retail and Service Managers	Freight Manager	149404	Organizes and controls the operations of an enterprise which operates a fleet of vehicles to transport goods and passengers	10 (+40 Food & Beverage)
	Transport Company Manager	149403	Organizes and controls the operations of an enterprise which operates a fleet of vehicles to transport goods and passengers	80

	Transport Operations / Owner Manager	149905	Organizes and controls the operations of an enterprise which operates a fleet of vehicles to transport goods and passengers	160
Professionals				
Air and marine transport professionals	Air transport professionals (e.g. pilots, air traffic controller, etc.)	2311	Pilot: airplane to transport passengers, mail and freight or provide agricultural, aviation and aerial surveillance services. Registration or licensing is required Air Traffic controller: Ensures the safe and efficient movement of aircraft in controlled airspace and aerodromes by directing aircraft movements. Registration or licensing is required.	55
	ROV pilot (<i>remotely operated underwater/other vehicle</i>)	2311	Pilot: Flies airplane to transport passengers, mail and freight or provide agricultural, aviation and aerial surveillance services. Registration or licensing is required	5
	Marine transport professionals (e.g. ship's master, ship's engineer, etc.)	2312	Controls and manages the operations of ships and boats. Registration or licensing is required	350
	Port Engineer	2312	Controls and manages the operations of ships and boats. Registration or licensing is required	5
Engineering professionals	Naval Architect / Marine Designer (233906)	233906	Designs and oversees the construction and repair of marine craft and floating structures. Registration or licensing may be required	10
	Transport Engineers • Rail Engineers	233205	Plans, designs, organize and oversee the construction and operation of transportation engineering systems.	5
	Aeronautical Engineers	233901	Performs and supervises engineering work concerned with the design, development, manufacture, maintenance and modification of aircraft for flight. Registration or licensing may be required.	10
	Electrical and Electronics Engineers	233301 / 233401	Designs, develops and supervises the manufacture, installation, operation and maintenance of equipment, machines and systems for the generation, distribution, utilization and control of electric power	30
	Aircraft maintenance engineers	233909		110
	Industrial Engineers (233501)	233501	Investigates and reviews the utilization of personnel, facilities, equipment and materials, current operational processes and established practices, to recommend improvement in the efficiency of operations in a variety of commercial, industrial and production environments	20

	Salvage Engineers			5
	Unspecified / other engineering professionals	233909		120
ICT professionals	Systems and network analysts, programmers, software engineers	261	Analyze, prepare, implement and test user specifications and requirements. Designs, develops, modifies documents and tests, implements, installs and supports software applications	35
Building and engineering technicians	Transport Electrical and Mechanical Engineering Technicians			70
	Aircraft and Avionics Technicians <ul style="list-style-type: none"> • Aircraft Maintenance • Aviation Technician 	312905		30

The shortage of managers accounts for two thirds (63%) of the list above and professionals for the remaining third (37%). Amongst the scarce managerial skills, Corporate Service Managers (Administration & Business) make up approximately a fifth (22%) of the total, whilst on the Professionals' side, Marine transport professionals (e.g. ship's master, ship's engineer, etc.) account for 15% of scarce skills.

The report will strive to verify and validate these figures in the following paragraphs.

SECONDARY LITERATURE REVIEW

A secondary literature review provided information to some extent on a more detailed level of views and perceptions on the shortages of skills related to transport and transport professionals in particular. Several specific transport professional and related occupations are discussed in the following pages based on published reports, labour market related studies and research, media reports as well as opinions expressed by market leaders and decision makers, experts and advisors to the transport sector.

Discussions on transport professional occupational categories are presented in no particular order, but have been grouped into the following categories:

- Land transport, which also includes all information generally noted on transport without special indication of sub-sector relationship (e.g. rail, etc.)
- Water transport
- Air transport
- Supporting transport including supply chain and storage
- Post and telecommunications
- Other, which includes information on transport related occupations outside the scope of this study

Land transport professionals: Engineering professionals and technical staff

No specific information could be gleaned from literature and other sources to determine specific figures for the various types of engineering disciplines specifically related to the transport sector as defined for purposes of this study.

Several searches of databases and other sources indicated that "engineers" are used to describe a wide variety and range of disciplines, i.e. rail engineers are for instance assumed to be civil engineers with specialist knowledge in rail related matter. The discussion below focuses on general figures related to engineering in the wake of the absence of more intelligent data. Another study being conducted

as part of the larger project, of which this study forms part, focuses primarily on engineers.

Engineering Council of South Africa (ECSA)

Each year, South Africa produces approximately 1400 engineers with B.Eng. and B.Sc. Eng. degrees. Between 1998 and 2004, 50 570 people enrolled at South African universities for engineering courses and only 8 900 graduated, according to ECSA statistics. That is a graduation rate of 17,5% across all engineering disciplines. The graduation rate for engineers is even lower at technicians (Universities of Technology). Between 1998 and 2004 there were 139 820 enrolments and 14 250 graduates. This is a graduate rate of 10% across all disciplines (Burmeister, 2006). Only about half of these graduates go on to register with ECSA as practicing professionals. Jipsa has determined that to meet projected demand, the average annual output of engineers from the higher education sector needs to increase by 1 000 to a total of 2 400 a year. Measures need to be put in place to ensure that these graduates become registered professionals.

While the shortage of engineers is a global phenomenon, South Africa needs to fast-track the importation of skills to meet immediate demand owing to the major increase in infrastructure development and other large capital projects.

At the CSIR conference, held during 2006, Jeff Radebe, Minister of Transport, indicated that there are a number of challenges facing the engineering community for both the present and the future. The number of engineering professionals declined as a result of reduced industry demand, reduced number of graduates, emigration and low rewards. The shortage is strongly felt in local municipalities:

- Of the 231 local municipalities 79 have no civil engineers, technologists or technicians
- Of the 231 local municipalities 42 have only one civil technician
- Of the 47 district municipalities 4 have only one civil technician

Provincial Departments of Transport

The following is an extract from the Provincial Budgets and Expenditure Review: 2003/04 – 2009/10 undertaken by National Treasury in 2006 in five provincial departments of transport (Eastern Cape, Free State, Gauteng, Limpopo and Northern Cape).

- The technical sectors of provincial departments of transport are understaffed
- The average age of engineers is 50, so most senior engineers will be retiring in the next few years

- The few remaining senior engineers available play a more managerial role, so the departments do not really benefit from their technical skills
- In some cases senior engineers have to do junior level work because of the shortage of available young engineers
- Statistics indicated that on average, each provincial department has 11 senior engineers, about 3 younger engineers and 2 candidate engineers. Western Cape, Gauteng and KwaZulu Natal are relatively well-resourced with senior engineers.

Posts	8 or more years experience after university degree	Engineers 4-7 years experience after university degree	0-3 years experience after university degree	More than 8 years experience after qualifications	Technicians 5-8 years experience after qualifications	0-4 years experience after qualifications
	Filled	55	18	9	93	89
Vacant	58	68	21	134	102	167
Total	113	86	30	227	191	256
% filled	49%	21%	30%	41%	47%	35%

The following is an extract of critical vacancies from the Provincial Government Western Cape Department of Transport and Public Works, Annual Performance Plan, 2007/08 to 2009/10.

Sub-programme	Professional and technical positions		
	No. of posts	Vacant posts	Vacancy rate
Programme support	10	2	80%
Planning	11	6	45%
Design	64	23	64%
Maintenance	31	13	58%
<i>Average vacancy rate</i>			62%

National Department of Transport

The Department of Transport reported in 2005: 213 out of 551 posts (39%) vacant; 35 out of 90 senior management posts (39%) vacant; 90 out of 198 “highly skilled production” posts (45%) vacant.

Land transport professionals - other

No other meaningful information could be found relating to land transport specific professionals. Also refer to the paragraph regarding vacancy data which follows later in this chapter.

Water transport professionals

No intelligent information could be gleaned with regards to specific water / marine transport professional occupations. A search was conducted of databases and other information sources and apart from searching for meaningful indications of shortages in skills related to marine specific professional occupations in general, the following job titles were also used: (a) marine engineers, (b) tug master, (c) marine pilot, (d) harbour master, and (e) ship surveyor.

Transnet National Ports Authority indicated in their questionnaire, completed as part of this project, a shortage of 33 pilots, 27 tug masters, 27 chief marine engineers, 7 marine engineer officers, 28 motorman and 20 petty officers. These are in addition to dredge masters, real estate specialists and civil engineers (no numbers provided). However, similar information could not be verified in terms of the rest of the market.

Water transport professionals - other

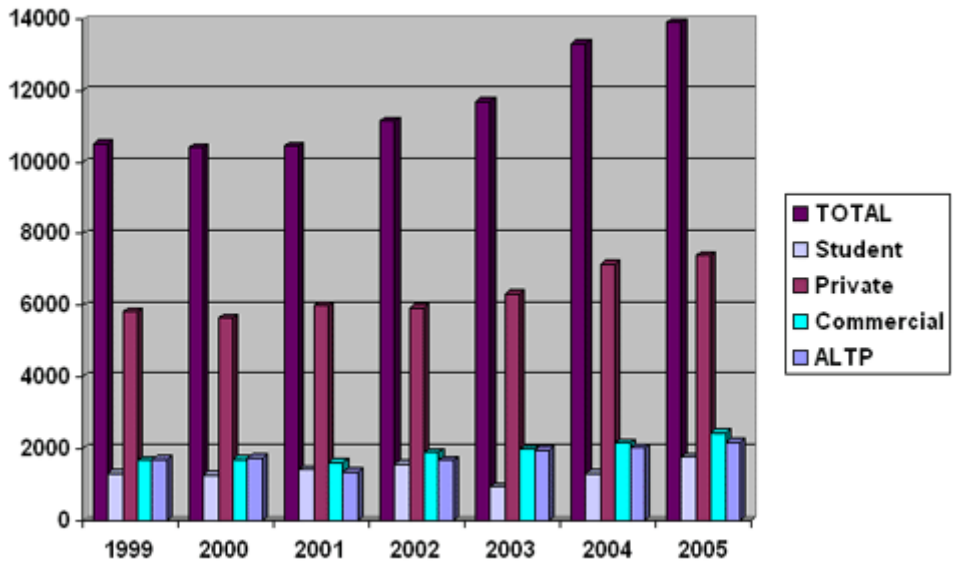
No other meaningful information could be found relating to water/marine transport specific professionals. Also refer to the paragraph regarding vacancy data which follows later in this chapter.

Air transport professionals

Airplane pilots and related Technicians, etc.

According to the South African Yearbook of 2006/7, there were 13 891 active pilots at the end of 2005 in South Africa. The number of airlines operating in South African airspace increased from nine in 1994 to more than 50 in 2004. In 1996, 21 air traffic control centres supported operations covering 145 licensed airports with paved runways, and over 580 aerodromes with unpaved runways (Daily Dispatch, 4/9/06).

Figure 3.1: Number of pilots, June 2006



Source: Aircrew Financial services

South African Airways (SAA)

SAA is in the process of considering the retrenchment of 2 232 staff members, including 225 pilots and 664 technicians, which would result in the remaining employees working “dangerously longer hours”. The airline needs to cut back on staff to save the airline R2.7-billion in the next 18 months. The SA Pilots Association indicated that many of SAA’s estimated 800 pilots, 29 of which are Black (a media report in “Die Burger” noted on 4 October 2006 that SAA employed 28 Black, 23 Coloured and 11 Indian pilots and co-pilots), were already flying an additional 150 hours a year. According to the association, pilots are clocking up 900 hours a year compared to the international norm of 750 hours. The retrenchments could result in pilots flying 1 000 hours a year. In addition the Aviation Union of SA reported that more than 40 highly qualified technicians had resigned in 2007, placing pressure on aircraft maintenance as the technical division also maintained other airlines such as Mango, Comair, Lufthansa and Saudi (Sunday Times, 2007).

The following SAA related statistics and information is quoted from a response delivered to Parliamentary question 1251 (2006) by the Department of Public Enterprises.

Table 3.2: Transformation Target for SAA Pilots - as at the end of August 2006

	2005 Plan	2005 Actual	2006 Plan	2006 Actual	2009 Plan
PDI	7%	8.3%	8.8%	8.3%	13.5%
White	2%	4.5%	4.9%	8.3%	6.6%

Females					
White Males	90%	87.2%	86.3%	86.9%	79.9%
Total Headcount	765	817	817	798	817

The table below represents the actual number of South African historically disadvantaged pilots employed in 2004 and 2005:

Table 3.3: Historically Disadvantaged Pilots Employed								
	African Male	Coloured Male	Indian Male	African Female	Coloured Female	Indian Female	White Female	Total
2004	6	0	3	0	1	0	10	20
2005	3	0	3	0	0	1	4	11
Total	9	0	6	0	1	1	14	31

SAA is currently in the initial stages of exploring the concept of Multi-Crew pilots' license (MCPL) which is specifically designed to meet the needs of airline operations worldwide. The need for the MCPL has been driven by the upsurge in air travel in recent years and the inability of the traditional flight training organizations to provide sufficient quantities of airline pilots and at reasonable cost. The Multi-Crew pilots training programme will take approximately two years to successfully complete, with the main focus being on airline specific operations and flying. The programme will include a significant amount of simulator training, in areas unique to airline operations. A cadet who successfully completes the Multi-Crew pilots' programme will be competent to fill the position of first officer on either a Boeing 737 or Airbus 319 narrow body short range airliner.

South African Air Force (SAAF)

Although the SAAF is not by definition part of the transport sector, it is well worth noting what present trends are relative to pilots etc., since the SAAF is a potential source of supply to the transport sector when pilots decide to leave. With regards to the SAAF the following is noted regarding shortages skills and possible influences on future skills profiles required (Daily Dispatch, 2006; State of Air Force, 2007):

- a) More pilots were leaving the force to join the private sector. This is a major concern as it takes more than R1m to train one pilot.
- b) Transformation plays a part in the shortage of pilots. Few black pilots have so far been trained.
- c) The SAAF employs the only Black female helicopter pilot in South Africa.
- d) The critical lack of qualified flying instructors resulted in the SAAF outsourcing basic helicopter training to Starlight Aviation in Durban during July 2006. The concept has proved both cost effective and easy for the students to adapt to. Authority for this alternative service delivery has been approved for the next two years, where after the SAAF will consider its options.

- e) A new plan to entice current aircrew members to remain in the SAAF, includes measures such as increasing the crew members' benefits.
- f) Participation in peacekeeping missions is expected to continue to grow, which calls for the SAAF to continue to update and enhance its strategies. The SAAF plays a major role in peacekeeping missions in African countries such as the Democratic Republic of Congo (DRC), Burundi and the Ivory Coast.

Commercial Aviation Association of South Africa (Caasa)

The Caasa (Engineering News, 2007) notes the following:

- a) Many airline pilots were originally air force pilots, which is no longer the case. Therefore, a substantial effort is required to attract more people into the aviation industry, including previously disadvantaged people, so that they can be trained as pilots.
- b) Apart from a pilot shortage, there is also a serious lack of technical skills to support the growing base of aircraft in South Africa.
- c) An aggressive, government-supported training and apprentice schemes are required to attract young black talent to the aerospace industry. An increased inclusion of previously disadvantaged people into the aerospace industry is imperative for the sustainability of the industry. Black economic empowerment (BEE) is slowly beginning to take root, necessitating further education and training on the part of BEE companies, as the aviation industry requires a high degree of expertise.
- d) Caasa hopes to attract more youth into the industry when it starts hosting the Africa Aerospace and Defense exhibition in Cape Town from 2008.

Global perspective

Forecasters anticipate the following global shortages to show in the next two decades (Dobler, 2007):

- China – 55 000 pilots (estimated on 2 400 new passenger and freight aircraft). It is estimated that there will be a shortfall of up to 8 000 experienced pilots over the next ten years, which will compel the country to hire foreigners.
- India – 5 000 pilots in the next three to four years. Last July India already had a shortage of 158 pilots
- Middle-east – 4 800 extra pilots over the next two decades. The Emirates is looking at doubling its present 1 200 pilots by 2012.

It needs to be noted that Europe, along with South Africa, Australia and New Zealand has supplied a large number of the pilots to these regions over the recent years.

Air Traffic Controllers (ATC) and related Assistants, etc.

The global aviation industry is facing an acute shortage of air traffic controllers, resulting in staff poaching among air traffic and navigation service providers (Business Day, 2006).

The Solidarity Union indicated that South Africa may experience a great shortage of Air Traffic Controllers which could see the country facing serious problems over the period of the 2010 FIFA Soccer World Cup. While the overall numbers are adequate at the present moment, there is a shortage of principal air traffic controllers, but a surplus of air traffic controllers and air traffic service assistants (Mhlambinso, 2006).

However, Mark Swarts, representative of the ATNS commented in November 2006 that there are approximately 200 air traffic controllers working across South Africa and that shortages experienced in the South African market is far less than that experienced globally. He further said that all stations had optimal staffing levels (Peiser, 2006). It may take anything between three to five years from initially joining ATNS as an Air Traffic Services Assistant trainee to the eventual qualification as a principal radar controller. It costs approximately R400 000 per person to train an air traffic controller. The Air Traffic Navigation Services (ATNS) is one of the main field-training units. After satisfying the conditions of the training contract with ATNS, qualified air traffic controllers are recruited to work around the world, in the Middle East in particular. They are offered highly competitive dollar-based salaries and work in a tax-free environment. Thus, despite ongoing training at the ATNS Academy, demand continues to exceed supply. ATNS, like its international counterparts, has no option but to compete in an international market for ATC staff.

ATNS currently employ approximately 720 professional staff (it is not clear what the specific portion of air traffic controllers are contributing to this figure) (Star, 2006). It is estimated that there is a 13% global shortage of air traffic controllers.

Air transport professionals - other

No other meaningful information could be found relating to air transport specific professionals. Also refer to the paragraph regarding vacancy data which follows later in this chapter.

Supporting transport including supply chain and storage

No meaningful information could be found relating to supporting and/or supply chain and storage transport specific professionals. Also refer to the paragraph regarding vacancy data which follows later in this chapter.

Post and telecommunications

As is the case with engineering professionals, several searches of databases and other sources indicated that “telecommunications” or “communications” are used to describe a wide variety and range of disciplines mainly related to information and communications technology (ICT) professional occupations.

Another study being conducted as part of the larger project of which this study forms part, focuses primarily on ICT professionals.

Other transport related non-professional occupations worth mentioning

Although the focus of this study is particularly on transport professionals, the authors decided to include all indications of other relevant transport related occupational shortages mentioned in the media. These occupational shortages can, at a later stage perhaps be further investigated.

Truck drivers

The steady growth of the South African economy, coupled with the demise of rail services across the country, has resulted in considerable growth in the road freight industry over the past 20 years. However, as the demand for truck transport increases, so too does the demand for skilled personnel to drive, manage and maintain the vehicles.

The shortage of skilled truck drivers, coupled with the impact of HIV/Aids on the industry, calls for skills upliftment programmes in the trucking industry. Over 80 percent of the nation’s goods are presently moved by road.

There is also a lack of learnerships in the country. About 400 to 500 learnerships were conducted in 2005, and while this helps in part to alleviate the severe shortage, it is not enough to fill the 1 500 new driving jobs that become available each year. Drivers need to have a minimum education of Grade 12, and need to demonstrate the correct aptitude. It is estimated that there are about 60 000 drivers in the country, representing 60 percent of the demand. About 30 percent of skilled drivers on average are lost every year and the industry is only replacing about 10 percent. The lack of accredited and audited heavy-duty truck driver training institutions is also a problem.

Some suggestions on curbing the shortage, include:

- a) Setting up a uniform driver training standard
- b) Implementing more rigorous trainer screening to ensure trainers are up-skilled and are able to impart knowledge to others
- c) The re-introduction of learnership programmes

Transport sector related vacancy data

In general, it is difficult to calculate skills shortage. For there to be a shortage, it is necessary for the demand for a particular type of worker to exceed the supply of such workers, but the concepts of supply and demand is in themselves problematic enough. It is necessary to draw on a range of indicators, perhaps the most important of them all, the time it takes to fill vacancies for the skill in question (Richardson, 2006).

Transport professionals (HSRC Survey of employers who have recently advertised vacancies)

A survey concluded by the HSRC on the advertisement of vacancies over the past three years, provided the following information related to selected transport managers and professionals:

Occupation	OFO code	Period 04/04 – 03/05 No. of vacancies advertised	Period 04/05 – 03/06 No. of vacancies advertised	Period 04/06 – 03/07 No. of vacancies advertised	Total No. of vacancies advertised
Supply and distribution managers (skill level 5)	1336	107	163	158	428
Transport Service Managers (skill level 4)	1494	7	12	8	27
<i>Air</i> Transport Professionals (skill level 5)	2311	28	24	35	87
<i>Marine</i> Transport Professionals (skill level 5)	2312	25	5	43	73

Source: HSRC (compiled for report)

Vacancies in the Department of Transport

Notwithstanding many efforts to convince officials from the Department of Transport to assist with this study in completing the questionnaire and providing staffing and vacancy figures, no response was received.

An analysis of the DoT's 2004/05 and 2005/06 annual reports revealed that the department's vacancy rate decreased from 39% in 2004/5 to 32% in 2005/6. Unfortunately detailed information regarding transport managers and professionals as scoped in this study, could not be obtained.

GLOBAL TRENDS INFLUENCING PROFESSIONALS IN GENERAL

In the wake of specific literature and views on the scope of transport specific migration movements, an article by Dominique Guellec, published in 2006 is

used to present some international perspectives regarding skills shortages and international employment and migration trends in general. A shortened excerpt from the original article appears below.

“There are few reliable statistics on the movement of people around the globe, and even fewer on those of the highly skilled. This is not surprising... [in the wake of] a lack of internationally agreed definitions and data collection methods.

The data ... reveals that ... the number of highly skilled people moving from poorer to richer countries is quite significant, especially from Asia to the United States, the United Kingdom, Canada and Australia. And these figures are rising, particularly among students and skilled professionals ...[a]n estimated 900,000 of [whom] ... entered the American labour market between 1990 and 2000 represent[ing] less than half the total number of temporary migrants entering the United States (1.9 million).

In Australia, Canada and the United Kingdom, and to a lesser extent in Denmark, Finland and Italy, highly skilled foreign or foreign-born workers are a relatively important component of the professional workforce. This is in stark contrast to Japan, where in the late 1990s less than 0.2 per cent of the total number of highly skilled workers was foreign.

Increasingly, the OECD countries aim to attract specialized foreign students – especially in science and technology – and eventually help them join the domestic labour market. While the United States attracts the greatest number of foreign students – a third of all those studying in the OECD – more than 10 per cent of university students in Australia, Switzerland, Austria and the United Kingdom are foreign.

[T]he underlying reasons for these global shifts..[include]... the rising demand in the developed world, [whilst]... education and training lagged behind, resulting in a dearth of 'home grown' candidates....Many countries therefore began to take a proactive approach to attracting highly skilled workers ... set[ting] up special policies to make it easier for highly skilled workers to get a visa, especially for temporary stays. Australia and Canada, which have long had such policies, recently reinforced them. And between the early 1990s and the early 2000s, the United States upped its quota of people eligible for the H-1B visa by a factor of three, with numbers now running to 195,000 a year. Germany meanwhile adopted the “green card” system, which allows skilled immigrants and their families to stay in the country for five years.

What has emerged is that some countries are far more successful than others in attracting highly skilled workers. Immigration policies matter, but they're not the whole story. Germany, for instance, aimed to attract 20,000 skilled workers with its green card system but, three years on, had only gained 13,000 individuals. Cultural conditions are important, as is language, with English-speaking countries

tending to be more popular. The crucial factor in luring the highly skilled, however, is the quality and number of job opportunities a country can offer...

The quality of education and research is another important factor. Bright students from developing countries, drawn to ... top universities ... tend to stay and work in host countries after they have completed their studies. So many foreign highly skilled workers were originally students who have now changed status, a process helped by generous policies. For instance, in 1999, a quarter of the immigrants living and working in the United States on H-1B visas had arrived as university students. And more than half of those benefiting from a special visa procedure in France in the late 1990s were foreign students already living in the country.

For the countries on the receiving end of this trend, the benefits are clear. A boost to the highly skilled workforce spells innovation and wealth. Skilled migrants have also become high-tech entrepreneurs....Intel, EBay and other well-known 'American' names were in fact conceived by non-US nationals. As they tend to develop more extensive connections abroad than nationals, immigrants also help host countries to strengthen links with international networks of science and technology. At the same time, however, they may have a negative impact on the wages of nationals.

For the countries 'losing' many of their best and brightest, the overall effects are less clear-cut. Inevitably, the emigration of highly skilled people can place a heavy burden on basic social services, including education and health. Doctors and nurses leaving Ghana or South Africa to pursue careers abroad, for instance, have proved disastrous for their home countries. And even the very nature of the 'brain drain' is debatable. It is certainly not always one-way, a factor that has led to the notion of a 'brain circulation'. Some countries with fast-growing economies, such as Ireland, Chinese Taipei and South Korea, are beginning to see the return of many who have succeeded abroad. With their experience, foreign capital and connections, these people have been able to kick-start high-tech industries on home ground....[H]ighly skilled migrants can [also] help their countries even when remaining abroad, by maintaining links with industry ...at home. Known as scientific diasporas, this is a relatively new trend – and hints at a reversal, or transformation, that many believe smacks more of 'gain' than 'drain'.

What is emerging is a complex international picture, with major variations from one region to another – both in terms of the actual landscape of the 'brain drain', and the relative successes of different policy strategies to deal with the phenomenon”.

SUMMARY

This chapter provided an overview of views, opinions, reflections and concerns expressed by roleplayers and stakeholders involved in the transport sector and

which are contained in secondary literature to a large extent, such as media articles, press releases, reports and discussion documents. The chapter tried to determine the relevant market views regarding the type and extent of specific transport related occupations.

In summary, and although not available on an occupation level, the following provides an indication of the expected growth scenarios for the transport sector in general, based on a report prepared by UE Development Economists in 2004 regarding the re-establishment of SETA's:

Table 3.5: Growth scenarios for the transport sector						
	SIC 7	2001	2006	2008	2010	Average growth p.a. (2001 – 2010)
Low growth scenario 2001-2010	Land	171 335	177 162	179 817	182 512	0.7%
	Water	311	67	36	20	-26.4%
	Air	23 353	29 306	32 140	35 248	4.7%
	Supporting activities (incl. storage)	52 682	55 562	56 842	58 152	1.1%
	Post & telecoms.	210 295	280 370	315 024	353 961	6.0%
High growth scenario 2001-2010	Land	171 335	197 122	208 098	219 686	2.8%
	Water	311	77	44	25	-24.3%
	Air	23 353	32 487	37 003	42 146	6.8%
	Supporting activities (incl. storage)	52 682	61 798	65 747	69 948	3.2%
	Post & telecoms.	210 295	435 733	582 508	778 722	15.7%
Most likely growth scenario 2001-2010	Land	171 335	192 292	201 174	208 263	2.2%
	Water	311	343	263	147	-8.0%
	Air	23 353	25 784	28 029	31 330	3.3%
	Supporting activities (incl. storage)	52 682	60 231	63 261	66 005	2.5%
	Post & telecoms.	210 295	278 873	332 959	437 449	8.5%

Source: Urban-Econ calculations based on IDC and Global Insight, 2004 (DTI, 2006)

One specific observation which impacts the level of detail of this study and the rest of this report is the lack of quantifiable data in the market, secondary data sources, even government and other reports to illustrate specific skills shortages experienced in the transport sector and more specifically relating to transport professional occupations. It is therefore difficult to verify and validate those figures included in SSP's and DoL's Master Scarce Skills List.

CHAPTER 4

This chapter presents a statistical analysis to determine what the actual demand for transport professional was over the past decade.

DEMAND FOR TRANSPORT PROFESSIONALS

Several studies have indicated that there has been a structural shift in South African economy since 1970, which has been characterized by a move away from primary production, towards greater emphasis on output in the services sector. Therefore production methods have been characterized lately by increasing capital intensity and the shift to microelectronics and in all sectors. This has resulted in a gradual increase in the need and preference for skilled, and semi-skilled employees opposed to unskilled employees (Fisher, 2006).

Together with the above general trend and the recent strong growth in the South African economy, there is a greater need for transport capacity. The boom in infrastructural development, telecommunications, mechanising supply chains, and the growth in the economy in general, have created many new opportunities for transport professionals.

This chapter investigates the demand for transport professional occupations at the hand of labour force and household statistics provided by StatsSA surveys. In addition, factors relating to the demand for skills have also been mentioned by respondents to a questionnaire circulated for purposes of this study.

LABOUR FORCE SURVEY AND OCTOBER HOUSEHOLD SURVEY

The OHS published by StatsSA, which was discontinued in 1999, was replaced by the LFS, also published by StatsSA, in 2000. Data gathered by these two reports were used to determine demand trends for the period 1996 to 2005.

Three main limitations regarding the data need to be taken into consideration, as mentioned in chapter 2.

Firstly, raw data extracted from the OHS (1996 to 1999), and the LFS (2000 to 2005) proved to be incomplete with many cells reflecting missing values, making it difficult, if not in some instances impossible, to meaningfully interpret the data.

Secondly, the incompatibility of the occupational coding systems used for the OHS/LFS and the Master Scarce Skills List, i.e. the SASCO/SOC and OFO coding systems, contributed to the fact that the data between the two sets of coding systems cannot be compared. The OFO discriminates between two categories, (a) managers and (b) professionals, whilst the SASCO/SOC

discriminates between three categories, (a) legislators, senior officials and managers, (b) professionals and (c) technicians and associate professionals.

Thirdly, although the OHS and LFS present the data on a four-digit level, single occupations such as pilots, transport engineers, etc. cannot be investigated on an individual basis as the same four-digit code is simultaneously applied to a range of occupations which forms a “cluster”. Clusters of occupations, in almost all instances, include occupations not specifically related to transport professions. This prevented a comparison across the various sectors.

Notwithstanding the above-mentioned limitations, the data is still presented below, as it does provide some insight into demographical and geographical as well as remunerative variables. The data is, however, only applicable to those occupational categories captured for SIC 7: The Transport, Storage and Communications Industry for the reasons explained above and earlier in Chapter 2.

Data was extracted to determine employment trends between 1996 and 2005. Owing to the variety of non-transport specific occupations included in the relevant occupational codes on a lower level relevant to the occupational categories, which could not be eliminated from the data, the graphs and tables reflect information pertaining to the main occupational groups serving as the basis for this study:

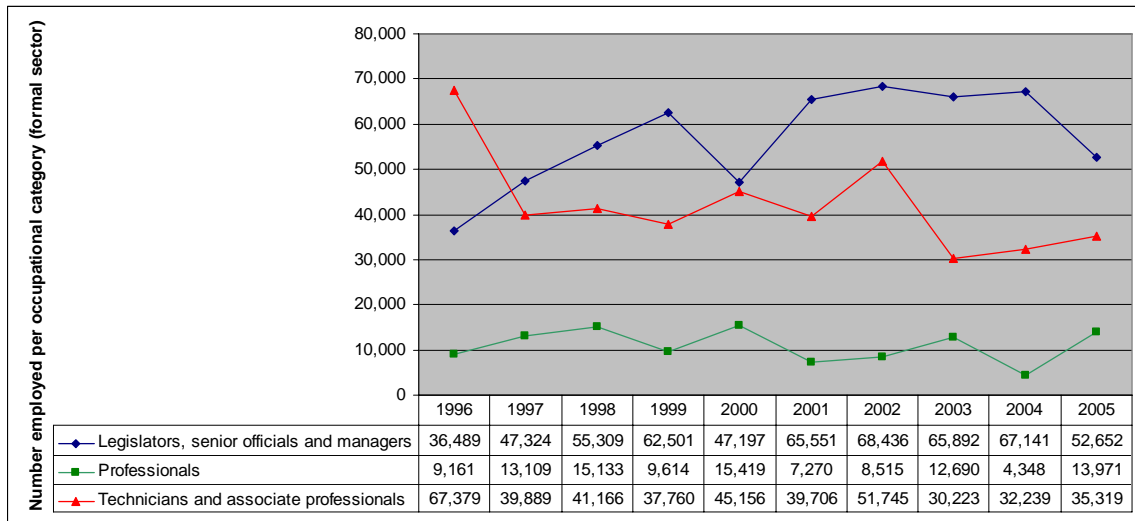
- Legislators, senior officials and managers;
- Professionals; and
- Technicians and associate professionals

Figures were primarily drawn for the formal sector which includes government institutions on all levels, parastatals, the private sector and self-employed individuals, NGO's, clubs, associations, etc.

Total employment for selected transport industry occupational categories

Figure 4.1 demonstrates the distribution of the transport industry workforce relative to the three main professional and managerial occupational groups selected for this study, over the last decade.

Figure 4.1: Total transport industry employment (formal sector) 1996 – 2005



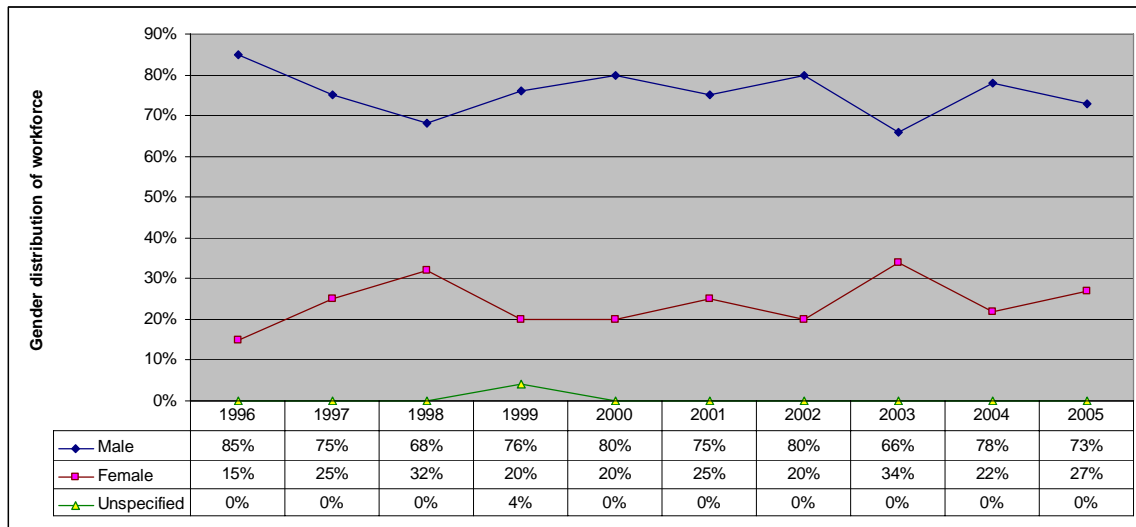
Source: StatsSA OHS and LFS

The sporadic fluctuations in the employment trend, like the drop in the number of legislators, senior officials and managers employed for 2000, are due to incompleteness of the data (missing values). If extraordinary fluctuations are ignored, it is evident that there is an increase in legislators, senior officials and managers, a decrease in technicians and associate professionals. The employment of legislators, senior officials and managers increased in total between 1996 to 2005 by 44% and professionals by 53%, whilst employment of technicians and associated professionals decreased by 48% between 1996 and 2005.

Gender distribution for selected transport industry occupational categories

Figure 4.2 reflects the distribution of gender relative to the total workforce involved in the three occupational groups over the past decade.

Figure 4.2: Transport industry - Distribution by gender (formal sector) 1996 - 2005



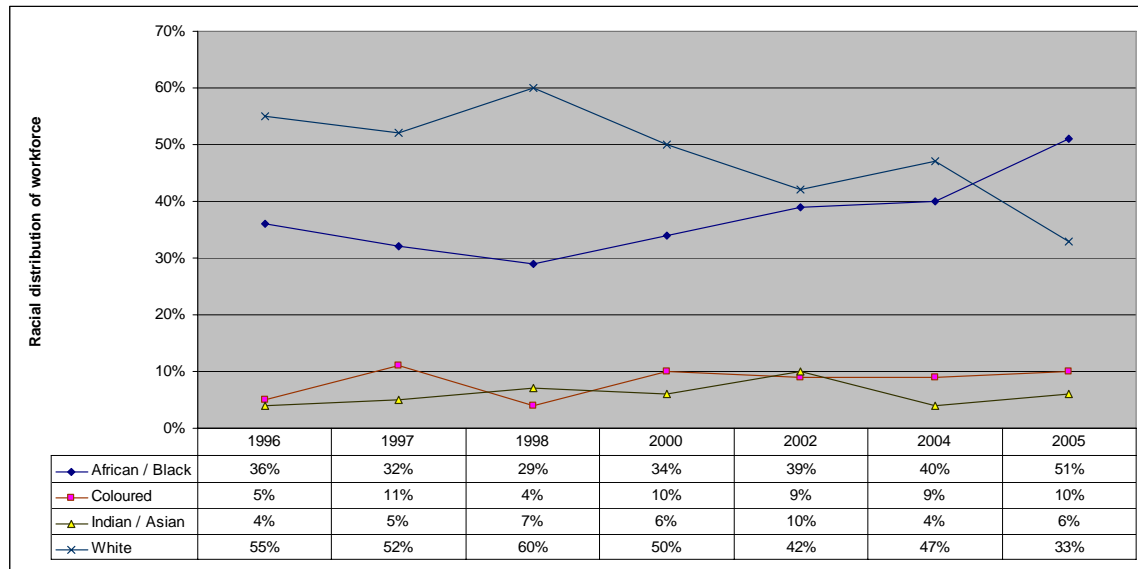
Source: StatsSA OHS and LFS

The transport professionals and managerial occupational groups are dominated by males. Males occupy more than two thirds (71% on average) of the three occupational groups, while females account for 22%. In 2005 males made up 73% and females 27% of the workforce. “Unspecified” account for the residual. Males represent on average 83% (females, 17%) of legislators, senior officials and managers over the ten year period, 64% (females, 25%) of professionals and 66% (females, 24%) of technicians and associate professionals (“unspecified” is excluded). Although there has been an overall increase in female professionals and managers, it is not significant, given the overall low representation of this group. Female legislators, senior officials and managers increased between 1996 and 2005 by 7%, professionals by 20% and technicians and associated professionals by 11%. Male representation decreased correspondingly.

Distribution by race for selected transport industry occupational categories

Figure 4.3 presents the distribution of race relative to the total workforce involved in the three occupational groups over the past decade.

Figure 4.3: Transport industry - Distribution by race (formal sector) 1996 - 2005

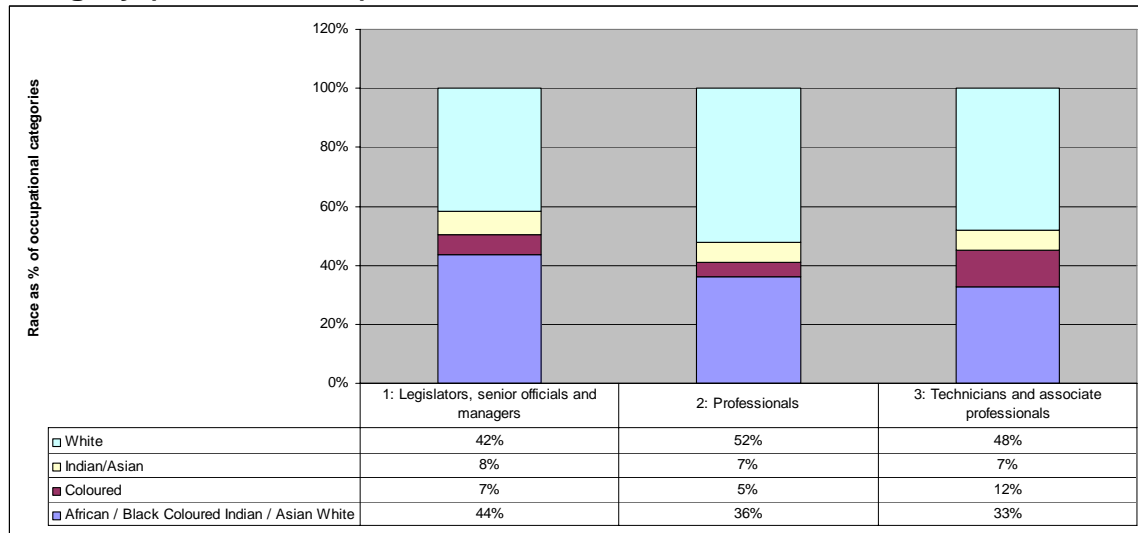


Source: StatsSA OHS and LFS

Although there has been a steady decline in the number of Whites in the three occupational categories, they dominated the scene up till 2002. Since 2002, Africans/Blacks have increased and are now in the majority. African/Black representation increased in total from 1996 to 2005 by 15%, Coloureds by 5% and Indians/Asians by 2%. Whites decreased by 22%. In 2005, Africans/Blacks accounted for 51% of the occupational categories, Coloureds for 10%, Indians/Asians for 6% and Whites for 33%.

Figure 4.4 presents the average distribution of race for each of the three occupational groups over the past decade.

Figure 4.4: Distribution of race per transport industry occupational category (formal sector) 1996 - 2005



Source: StatsSA OHS and LFS

Africans/Blacks are most represented in the legislator, senior official and manager occupational category (44%) and proportionally less in the professionals (36%) and technicians and associated professional categories (33%). Whites dominate the professionals category with a 52% share. Colouredes and Indians/Asians are in the minority.

Distribution by age for selected transport industry occupational categories

Figure 4.5 reflects the distribution of the total workforce for the three occupational groups relative to its age per annum over the past decade.

Figure 4.5: Transport industry - Distribution of age per annum (formal sector) 1996 - 2005

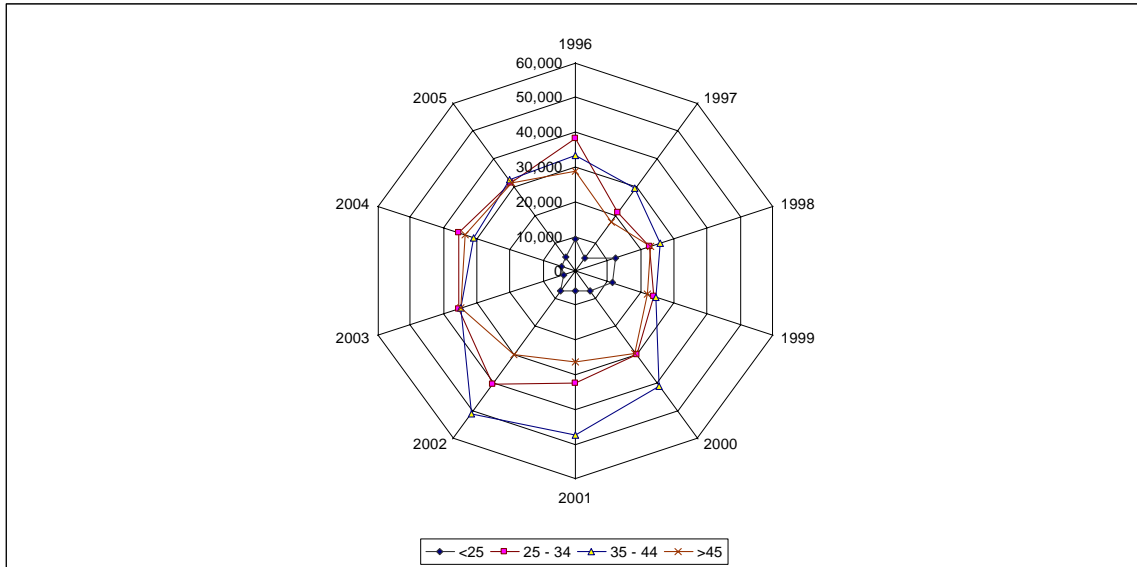
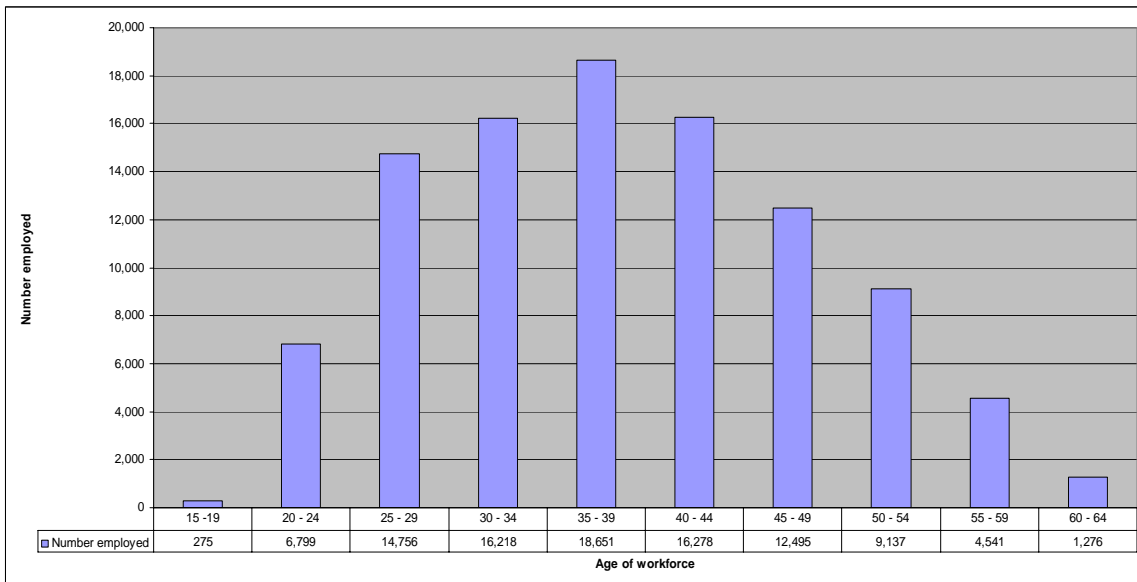


Figure 4.5 illustrates that the workforce has progressively aged over the past ten years, peaking in the >45 age group in 2002. Although the 35 to 44 age group increased between 1997 and 2002, it has since started decreasing again.

Figure 4.6 presents the average age of the workforce in the three main occupational groups over the past decade.

Figure 4.6: Transport industry - Distribution of age (formal sector) 1996 - 2005



Source: StatsSA OHS and LFS

From Figures 4.5 and 4.6 it is clear that the workforce is relatively “old” with an approximately third (35%) being between 35 and 44 years old and an approximately another third (27%) between 45 and 64 years old. The individual occupational levels present a similar picture and don’t differ substantially from these percentages. Legislators, senior officials and managers are the worst case as 76% of the workforce is between 35 and 64 years old with an equal distribution between the 35 to 44 (38%) and the 45 to 64 (38%) categories.

Skills bands for selected transport industry occupational categories

Skill bands have been identified in accordance with the NQF schema. These are demonstrated below.

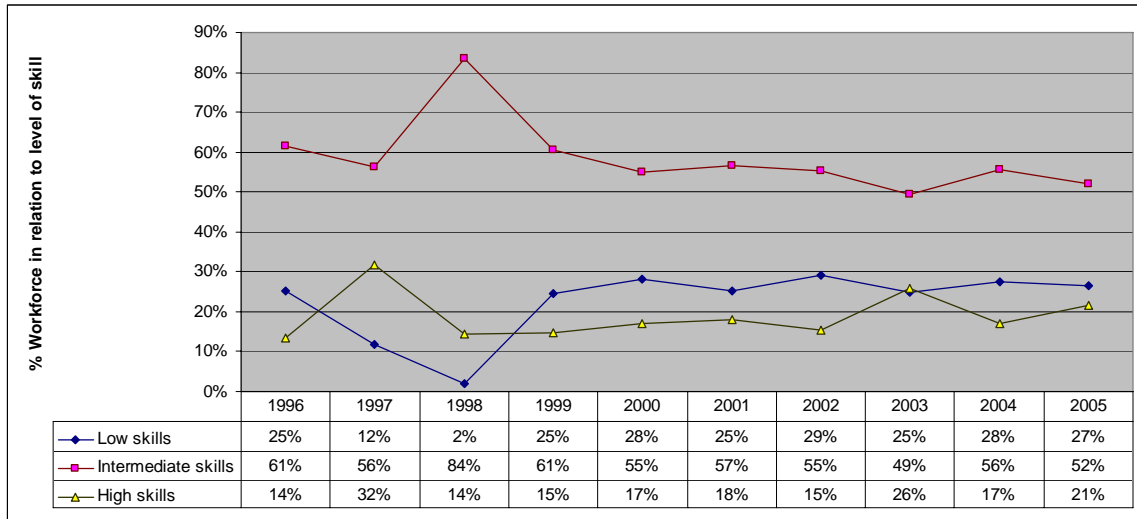
Table 4.1: Three Skills Levels and the National Qualifications Framework		
NQF Level	Education level	Skill Band
1	Grade 9	Entry-level skill (low skill) (Pre-Matric)
2	Grade 10	
3	Grade 11	
4	Grade 12	Intermediate skill
5	College and Technicon National Certificates and Diplomas	(matric, plus: post-school, pre-degree qualifications)
6	University Degree	High skill (Equivalent to a higher education degree and post-graduate courses)
7	Honours and Masters Degrees	
8	Doctorate Degree	

(Source: Kraak)

The data drawn from the OHS and LFS surveys, indicates that half of the collective workforce in the three occupational categories selected for this study, holds a Grade 12, a College and/or Technicon (University of Technology) National Certificate and/or Diploma.

Figure 4.7 reflects the distribution of the average skills presented over the past decade for the total of the three occupational groups.

Figure 4.7: Transport industry - Distribution of skills bands (formal sector) 1996 - 2005

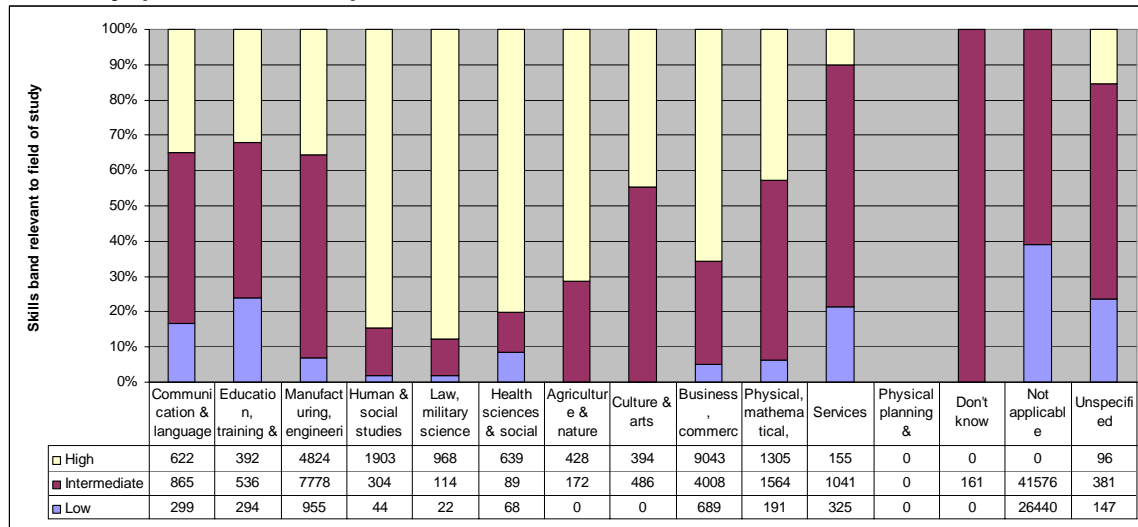


Source: StatsSA OHS and LFS

Approximately 50% of the workforce represents the intermediate skills band, whilst the remaining 50% is more or less equally distributed between the high and low skills bands. The intermediate skills band displays a downward trend, whilst the low skills band seems to be on the rise. The high skills band has remained fairly constant over time. Fluctuations in trends during 1997 and 1998 are again as a result of incomplete and/or incorrect data. The distributions of individual occupational categories relative to the skills bands were much the same as the trends displayed in Figure 4.7.

Figure 4.8 demonstrates the average total distribution over the past decade of skill bands as a result of the type of qualifications that the workforce obtained in the various study fields.

Figure 4.8: Transport industry - Distribution of skills bands relative to fields of study (formal sector) 1996 - 2005



Source: StatsSA OHS and LFS

Legend: Study fields

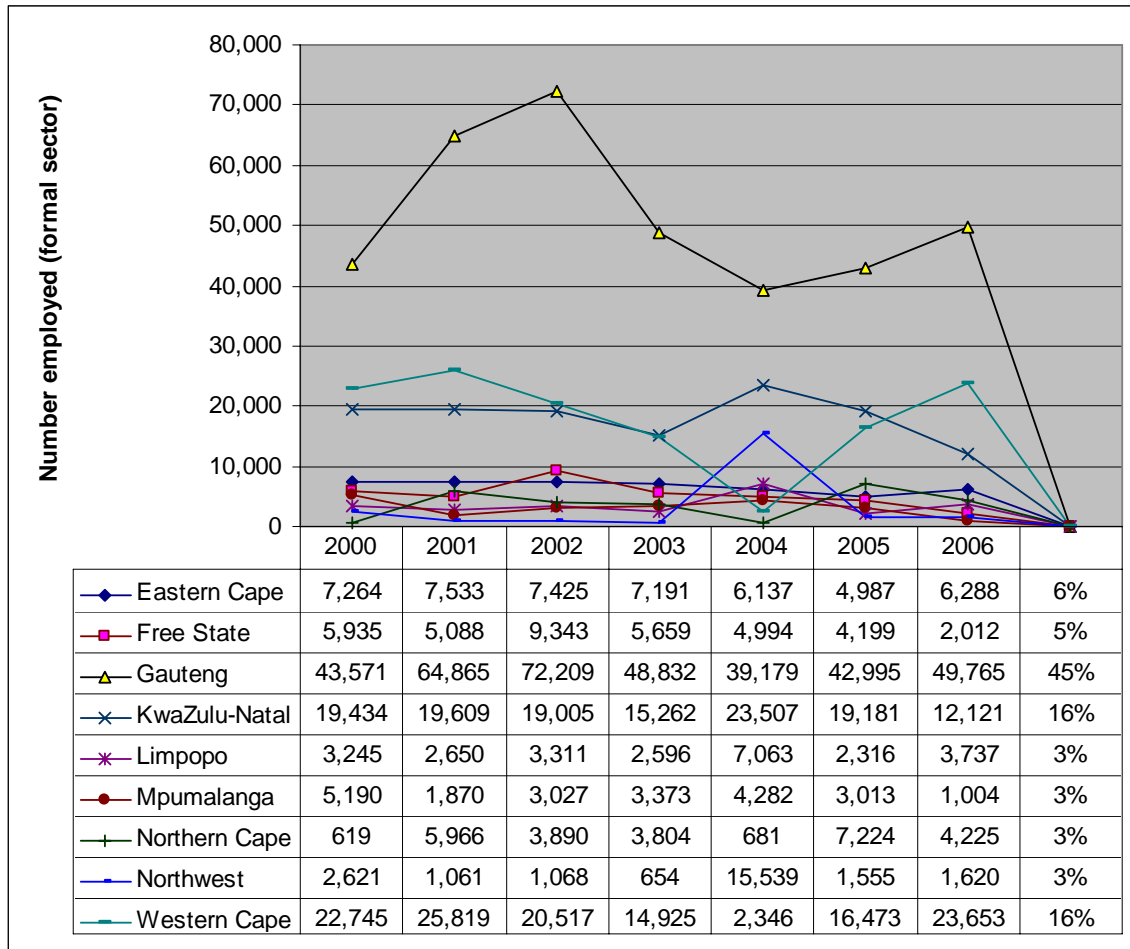
Communication & language	Health sciences & social services	Services
Education, training & development	Agriculture & nature conservation	Physical planning & construction
Manufacturing, engineering & technology	Culture & arts	Don't know
Human & social studies	Business, commerce & management studies	Not applicable
Law, military science & security	Physical, mathematical, computer & life sciences	Unspecified

Taking the information of Figures 4.7 and 4.8 into consideration it is evident that 50% of the workforce, who represents the intermediate skills band studied mainly in fields related to communication and language, education, training and development, manufacturing, engineering and technology, culture and arts as well as services and a large portion is estimated to have only matric (estimated to be represented by the categories not matched up with any recognizable qualification, i.e. “don’t know”, “not applicable” and “unspecified”). The high skills band is primarily represented in study fields such as human and social sciences, law, military, science and security, health sciences and social services, agriculture and nature conservation as well as business, commerce and management studies.

Geographic distribution of selected transport industry occupational categories

Figure 4.9 demonstrates the geographic distribution of the combined workforce for the three occupational groups for the period 2000 to 2006.

Figure 4.9: Transport industry - Geographic distribution of workforce (formal sector) 2000 - 2006



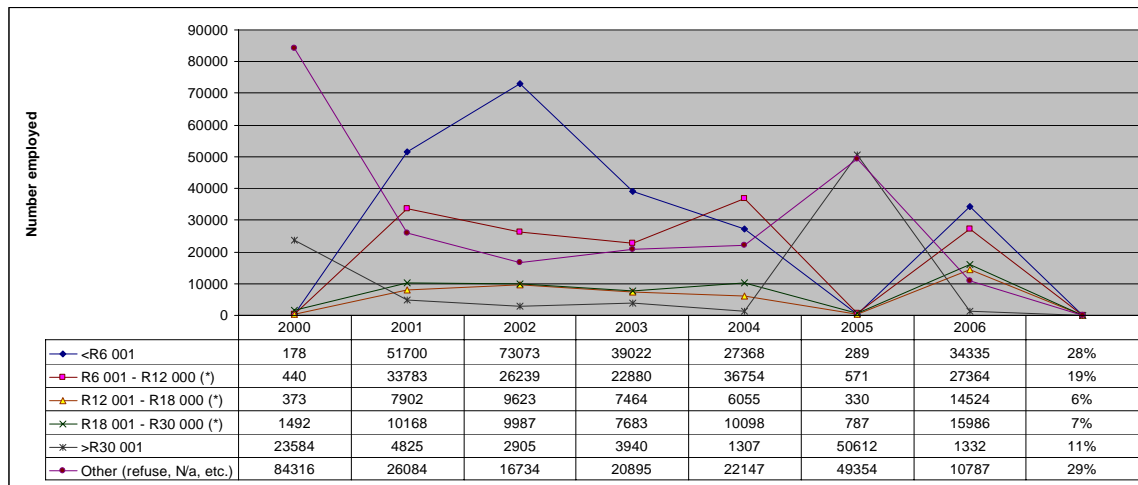
Source: StatsSA LFS September

Gauteng employs on average nearly half (45%) of the population of transport professional and managerial occupational groups. Second place is shared by the Western Cape and KwaZulu Natal, employing on average 16% of the transport related occupational population each. Between these three provinces, they employ on average almost 80% of all transport legislators, senior officials and managers, professionals and technicians and associate professionals in the transport sector.

Income distribution to selected transport industry occupational categories

Figure 4.10 demonstrates the distribution of average monthly income of the combined workforce for the three occupational groups for the period 2000 to 2006.

Figure 4.10: Transport industry - Monthly income (formal sector) 2000 - 2006



Source: StatsSA LFS September

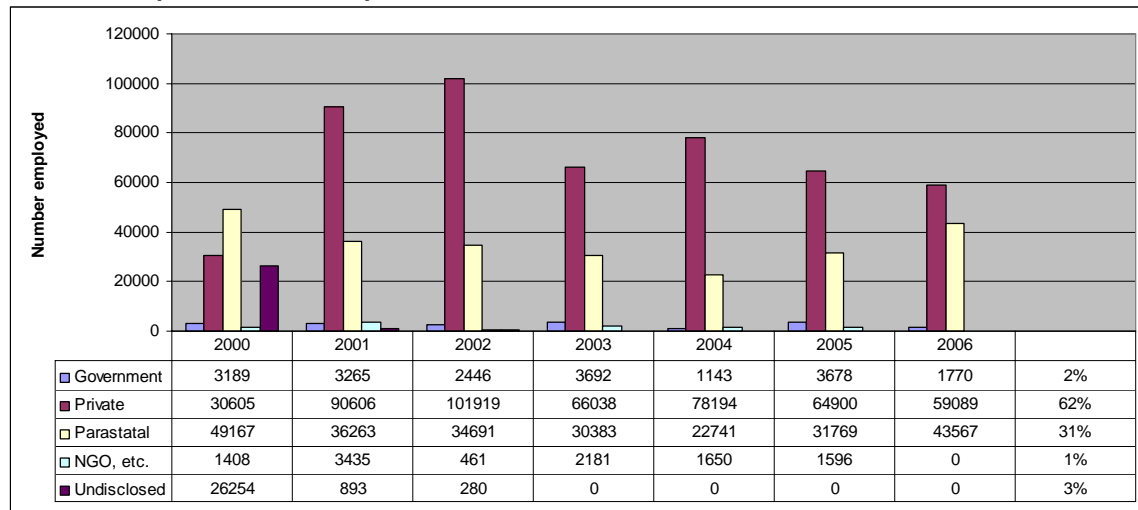
Income categories were re-grouped for estimation purposes. Because of differences in categorizing methods used in the LFS surveys over the period, values reflected above are not absolute, but relative displays of trends in income.

Apart from the “other” category, nearly a third (28%) of transport related professionals represented in the three occupational groups included in this study, has a monthly income between R6 001 and R12 000. Approximately a fifth (19%) has a monthly income between R12 001 and R18 000.

Types of business of selected transport industry occupational categories

Figure 4.11 demonstrates the distribution of the combined workforce for the three occupational groups amongst different employer organizations and sectors or types of businesses, i.e. government, private, non-governmental institutions, etc. for the period 2000 to 2006.

Figure 4.11: Transport industry - Distribution of workforce across types of business (formal sector) 2000 - 2006



Source: StatsSA LFS September

The types of businesses have been re-grouped for purposes of estimation. Categories reflected in the table above, include:

- Government : national, provincial and local government
- NGO's, etc. : a club, community organization, welfare organization, non-governmental organization, church, co-operative, self-help association, labour union, professional association, business league
- Private : a private business or a private household, self-employed
- Undisclosed: other, don't know, not applicable, undisclosed

Private sector employment of the three main occupational groups constitutes approximately two thirds of the workforce (62%). If the categories for 'Government' and 'Parastatal' are combined, the newly formed category employs more or less the remaining third of the workforce.

TRANSPORT INDUSTRY MARKET RESPONSES (QUESTIONNAIRE)

The longer version of the questionnaire developed as part of this study to investigate market perceptions pertaining to the shortage of transport industry related skills, were completed by 9% of the initial sample of 47 enterprises included in the study. The shorter version was completed by a further 21% of the sample. Refer to Chapter 2 for the logic followed in this approach.

As the response rate was low, the deductions made from this study are not viewed as representative of the transport sector and related occupational categories. However, the information is still presented as it does provide some insight into labour market issues, although on a very small scale.

The responses and information received for selected questions is presented on the next pages.

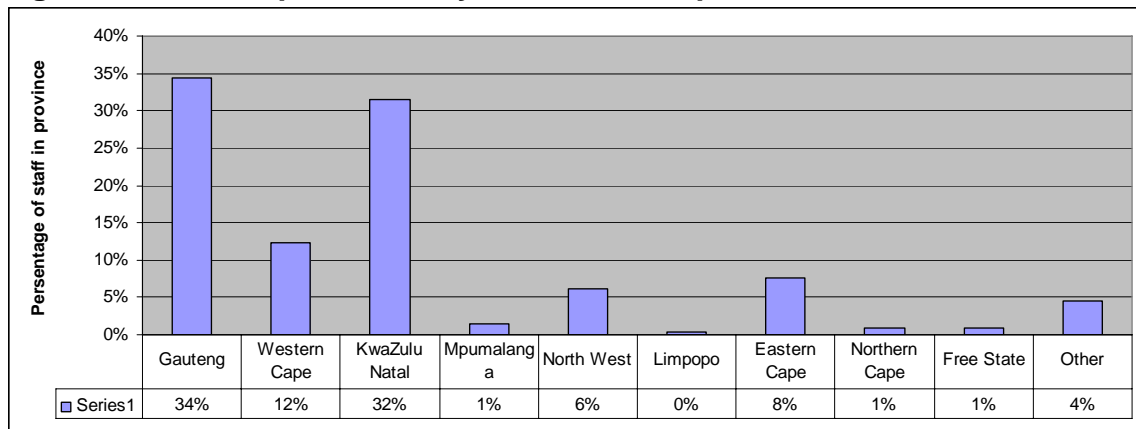
Transport Industry Demographics and Geographics

Geographical distribution

All provinces were represented. Approximately 70% of the enterprises conducted business on a national level with office in at least two provinces and more.

Most of the staff within the sample was situated in Gauteng (34%) and KwaZulu Natal (32%). These two provinces account for approximately two thirds of the geographical distribution of staff.

Figure 4.12: Transport industry - Provincial representation



Responding enterprises have been in business between six and fifteen years on average.

Occupational distribution

Managers (in accordance with the OFO classification) accounted for 38% and Professionals for 62% of these two occupational categories combined.

Managers as an occupational category consisted of an average of 73% Chief Executives, General Managers and Legislators, 17% Specialist Managers and 10% Hospitality, Retail and Service Managers. Professionals as an occupational category consisted of an average of 21% Business, Human Resource and Marketing Professionals, 70% Design, Engineering, Science and Transport Professionals, 3% ICT Professionals and 7% Legal, Social and Welfare Professionals.

Racial distribution

A racial breakdown could not be determined as the data provided did not correlate with the totals amount of the staff compliment provided and were in most instances incomplete.

Demand for skills in the transport industry

Estimation of additional requirements

Respondents were requested to indicate the number of additional posts expected to be required in 2008, 2009, 2010, 2015 and 2020. Data revealed that an average increase of 34% in Managers and approximately 300% in Professionals is expected. Professionals primarily included Design, Engineering, Science and Transport Professionals (200%).

Most important scarce skills required

The table below summarizes the most important scarce skills identified by respondents, which includes amongst others airport planners and transport professionals. The list includes occupations outside the scope of this study for information purposes where appropriate.

Table 4.2: Transport industry scarce skills requirements		
Scarce skill	Primary reason for scarcity	Measures taken
Managers and Professionals		
Airport Planners	Equity Engineering Candidates	Trainee Program / Mentoring
Contract Managers	Experience and general shortage of trained people; Ageing and Migration	In-house training Management Trainees projects
Engineers	Equity Engineering Candidates	Accelerated Development Program Bursary Funding of University students
Environmentalist	Fairly new profession, Demand and Supply issues; Equity	
Financial (Treasury / Economist)		
Geotechnical Engineers	Demand and Supply ; Ageing	Career DVD encouraging South African youth to seek careers in engineering and within the Built environment.
IT Specialists	Demand and Supply ; Equity	Mentoring and Targeted Recruitment
Land Surveyors	Professional registrations	TRAC promote mathematics and physical science for school leavers to enter into tertiary education affecting civil engineering
Marketing Executive	Equity	In House and Field Training
Marine professionals (e.g. marine engineers, tug)		

master, marine pilot, petty officer, motorman)		
Pavement Engineers	Ageing	Sponsor Chair in Pavement Engineering – University of Stellenbosch
Project Managers	Equity Engineering Candidates	Accelerated Development Program
Railway engineers		
Statutory Control	Demand and Supply ; Aging, Emigration	
Transport professionals		Trainee Management Programme
Other occupations		
Automotive and Engineering Trade workers	Emigration, few apprenticeships currently run	No current measures being considered
Diesel Mechanics	Qualification – education & lack of apprenticeships over last 5-10 yrs Business understanding	Busy with accreditation of workshops
Drivers ,Code 14	Education, experience	Driver learnership
Engineering technicians (electrical heavy current and light current, mechanical, civil)		
Heavy Plant Operators		
Technicians and Trade	Shortage of trade employees in the country, highly paid in their current positions	

Most important scarce skills required

Reasons for the scarcity in transport industry related skills presently experienced are offered in order of importance as:

- Unattractive salary packages offered locally opposed to global remuneration trends together with global trends in shortages resulting in competition for the same set of resources
- Working conditions and hours
- Lack of customized training for specific skills sets and the poor delivery of training
- Affirmative action policies and employment equity targets opposed to the supply of skills amongst employment equity target groups
- Demographical and geographical factors such as race, relocation, migration, etc.
- Present crime levels in certain parts of the country
- The long duration of training programmes
- Global trends in shortages and competition on a global scale for resources

- Low margin high risk nature of some businesses
- Unattractive career plans and the lack of career advancement
- The lack of literacy and language skills in areas where staff is expected to interact with especially overseas clients
- Large projects such as Gautrain creates false expectations about remuneration packages
- Mechanization and technological improvements to industry

Most important generic skills required

Transport industry respondents identified the most important generic skills required. Responses included:

- Analytical skills
- Business skills
- Communication skills
- Computer literacy
- Conflict management
- Customer relationship management
- Diversity management
- Leadership and management skills
- Problem solving

Expected future trends affecting skills requirements

Transport industry respondents provided their perspectives on future trends and issues that may have a further impact on the availability and demand for skills. Key issues included:

- Increased infrastructural activity, especially till 2010, will require additional transport capacity to be availed throughout the country. This increases the need for capable staff to operate, service and maintain additional vehicles needed to supply increased volumes of goods and services.
- The increasing numbers of providers entering the market as vehicles and equipment become more readily available stretches the capacity and availability of already scarce resources.
- The increased pressure to comply with safety, health and environmental requirements in especially the fuel and chemical sectors, places a responsibility on enterprises to meet more onerous requirements.
- The planned exchange of road freight in selected sectors to rail and pipeline transport by 2015, will eventually reduce the need for current scarce skills, which may create an oversupply in specific skills, but may also require new skills which are may not be readily available or affordable.

- The increasing demand for scarce skills on global basis together with the rising age of the workforce increases the demand for higher remuneration packages and alignment to global market trends.

TRANSPORT INDUSTRY RELATED PROFESSIONAL BODIES

It needs to be noted that although there are several professional bodies to which transport professionals and organizations can belong, all of them operate on a voluntary membership basis. None of the bodies, e.g. ECSA, Caasa, etc., could supply specific transport professional related membership figures as most “transport professionals” are registered on databases as for instance differing disciplines of engineering, which is not directly recognizable as transport related.

It is also not compulsory for transport managers and professionals to register with any specific association or professional body.

SUMMARY

This chapter focused on demand side factors influencing the perceived skills shortage pertaining to transport professionals in South Africa. As mentioned in the summary of Chapter 3, it is again difficult to quantify the exact demand for specific transport professional occupations since data sources do not provide the level of detail necessary to enable the execution of this objective.

From the figures and related information and taking cognizance of the earlier secondary data review, it is evident that there is some level of skills shortage experienced across all major employer groups, national, provincial and local government, parastatals, etc., as well as in the private sector and most probably across all occupational levels, but due to the lack of specific transport related figures and quantities, other than those supplied in WSP’s and SSP’s, an exact number of skills which are in short supply cannot be calculated.

From the literature review, it is evident that engineers, pilots and traffic controllers are in short supply, engineers more so than the other two groups.

From this chapter, it is evident that the main contributing factors to the skills shortage include:

- The decrease of 48% in technicians and associate professionals
- The dominance of males of the workforce, occupying 73% of all posts in 2005
- Affirmative action policy target perhaps not being met with Whites still occupying 33% of posts in 2005, Indians only 6% and Coloured only 10%
- Affirmative action policy target perhaps not being met with Whites dominating the professional category by 52%

- The ageing workforce, with approximately 35% being between 35 and 44 years old and another 27% older than 45 - legislators, senior officials and managers are the worst case with 76% between 35 and 64 years old
- 50% of the collective workforce holds a Grade 12, a College and/or Technicon (University of Technology) National Certificate and/or Diploma.
- Approximately 50% of the workforce represents the intermediate skills band, whilst the remaining 50% is more or less equally distributed between the high and low skills bands - the low skills band seems to be on the rise
- More than 50% of the workforce, who represents the intermediate and high skills bands studied mainly in non-transport related and non-mathematical, science and technology fields
- approximately a third (28%) of professionals have a monthly income between R6 001 and R12 000 and a fifth (19%) has a monthly income between R12 001 and R18 000
- Respondents to the questionnaire indicated an expected rise in required posts of 34% of managers and approximately 300% of professionals; the latter included Design, Engineering, Science and Transport Professionals (200%)
- Other reasons offered by respondents included:
 - Unattractive salary packages offered locally opposed to global remuneration trends together with global trends in shortages resulting in competition for the same set of resources
 - Working conditions and hours
 - Lack of customized training for specific skills sets and the poor delivery of training
 - Affirmative action policies and employment equity targets opposed to the supply of skills amongst employment equity target groups
 - Demographical and geographical factors such as race, relocation, migration, etc.
 - Present crime levels in certain parts of the country
 - The long duration of training programmes
 - Low margin high risk nature of some businesses
 - Global trends in shortages and competition on a global scale for resources
 - Unattractive career plans and the lack of career advancement
 - The lack of literacy and language skills in areas where staff is expected to interact with especially overseas clients
 - Large projects such as Gautrain creates false expectations about remuneration packages
 - Mechanization and technological improvements to industry

CHAPTER 5

This chapter presents a statistical analysis of the actual supply of transport professionals over the past decade.

SUPPLY TO TRANSPORT OCCUPATIONS

Overview

Supply-side problems manifest themselves to a large extent in the mismatch of skills, in so far as the characteristics of the available pool of potential employees do not satisfy labour demand in terms of specific qualifications and skills. This is the result of amongst others, the debatable quality of training institutions and teaching capital, incorrect and/or inappropriate fields of study offered by training institutions, the lack and/or incompleteness of overarching management information on the labour market (this is defragmented and incomplete), the inability of learners to make the transition from school to FET's, Universities or Technicons (Universities of Technology), as well as insufficient communication and collaboration between enterprises and training institutions.

Studies in the majority of careers in the transport industry can be sourced from a number of accredited service providers. Due to the technical nature of the content of transport occupations, a person would be required to master a number of entry requirements, but amongst them probably the most important is mathematics, science and technology.

This chapter presents the supply-side factors influencing and contributing to the shortage of transport managers and professionals presently encountered. A statistical analysis investigates the supply of students through schools, the supply of trained potential employees from further education and training (FET) institutions as well as from higher education and training (HET) institutions. In addition, the effect of immigration and emigration is also investigated.

The LFS was also analyzed to determine if possible migration trends between national sectors could be established. In the extraction of relevant data on "previous occupation" no statistics were available. It could therefore not be determined if between-sector migration has a positive or negative impact on transport professional occupation categories.

Secondary education

While approximately 25% of South Africa's budget is awarded to education, some schools still lack basic services, learning materials and teachers.

The education system is where it all starts. In order to develop skills that are aligned to economic needs South Africa needs to have well-qualified teachers

and a school curriculum which adequately prepares pupils for higher education and employment. Neither of these requirements is met at present.

Dennis Dykes, a senior economist at Nedbank, argues that the quality of South Africa's matriculants is not acceptable in a global context and could have negative effects on the economy. Dykes' sentiments are echoed by Salim Vally, a Senior Researcher at the University of the Witwatersrand's Education Policy Unit, who says that "[t]he high number of matriculants with only senior certificates churned out annually is troubling, given the levels of unemployment."

A recent reply (July 2006) to a DA parliamentary question revealed that a substantial number of South Africa's public school teachers are under-qualified. Currently, 12 000 out of the 287 000 public school teachers only have a matric certificate (6 040) or a Standard 8 and two years training (6 053). Only 33 000 teachers or 11.6% have a postgraduate degree.

More alarming is that, although the total number of school teachers increased from 256 000 in 2004 to 287 000 in 2005 (an increase of 31 000), the percentage of teachers with just a matric - the lowest qualification - has also increased (from 1.8% to 2.1%) while the percentage of teachers with postgraduate qualifications - the highest qualification - has declined (from 12.4% to 11.6%).

Speaking in Pretoria in June 2005, Education Minister Naledi Pandor said that there were not enough jobs being created to provide employment for young people and there are not enough training opportunities to meet their needs. Many school leavers do not have marketable skills or training opportunities, meaning that, while young people suffer debilitating unemployment, there are half a million job vacancies that cannot be filled.

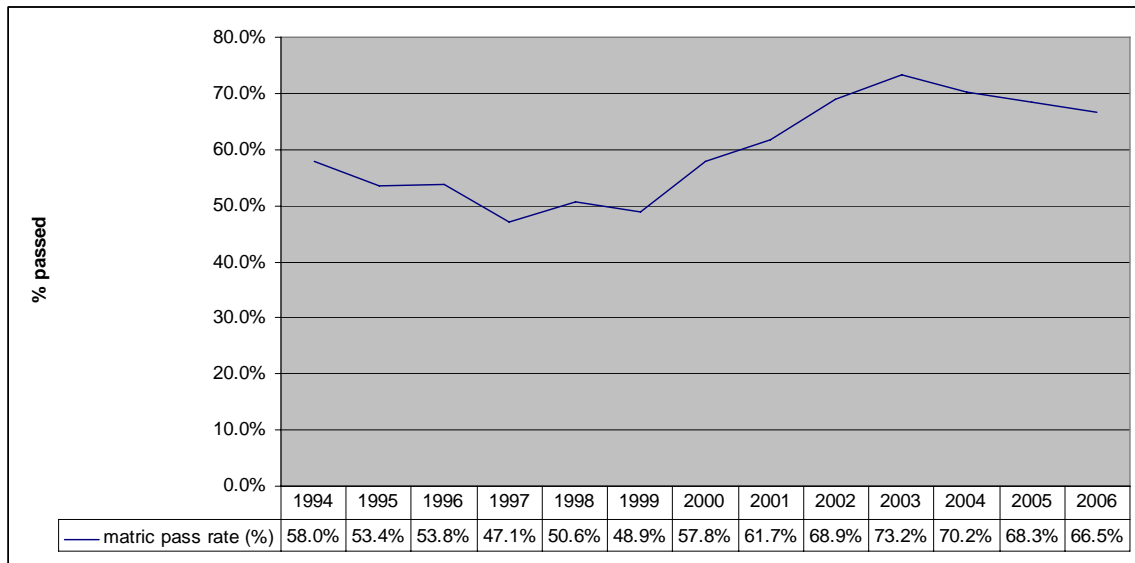
A 2005 JCP International research document entitled "Employment Trends in South Africa" found that matric-level unemployment rates had risen from 25% to 40% since 1995 and tertiary-level unemployment rates from 6% to 15%. A study, "The Post-Apartheid South African Labour Market" published by the Development Policy Research Unit at the University of Cape Town in April 2005, showed that the unemployment rate of "degreed African and white workers" had increased from 18 000 in 1995 to more than 44 000 in 2005.

Where it all starts: matric pass rates

The matric pass rate is important in so far as it is the trigger of the supply chain pertaining to the required skills sets which are necessary to address the skills shortage in especially the transport sector, but also on a national basis.

Figure 5.1 reflects the percentage of matrics (Grade 12's) that wrote and passed the senior certificate exam between 1994 and 2006.

Figure 5.1: Matric pass rate 1994 - 2006

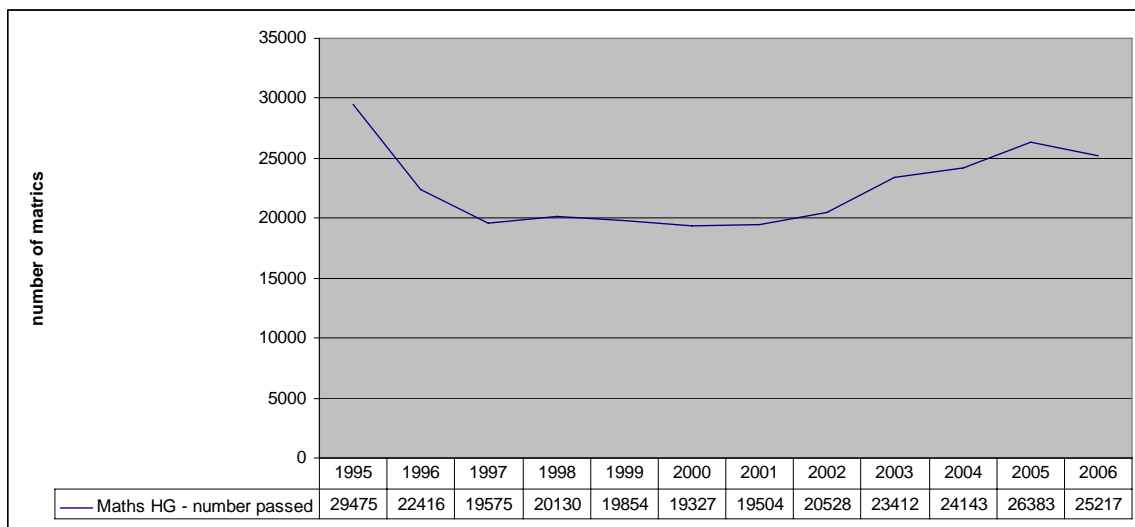


Source: Development Indicators, 2007-10-03

The pass rate dropped to below 50% in 1997, but then gradually improved again to a 73,2% pass rate in 2003. Unfortunately it has steadily declined since then to 66.5% in 2006.

Figure 5.2 demonstrates the number of matrics that wrote and passed Mathematics on a Higher Grade between 1995 and 2006.

Figure 5.2: Number of matrics passing Mathematics Higher Grade 1995 - 2006



Source: Development Indicators, 2007-10-03

The number of matrics that passed Mathematics on a Higher Grade initially dropped in 1996 by 31% compared to the year before. After a period during

which the number of students that wrote the exam stayed fairly stagnant till 2002, the numbers increased by 12% in 2003, a further 3 % in 2004 and another 8% in 2005. The number of students unfortunately again decreased by 5% in 2006.

Trevor Manual mentioned at a post budget seminar in February 2007 that the number of matriculants that passed higher grade mathematics in 2006, constitute only 7% of all candidates that wrote and passed matric (Pickworth, 2007). Of these only approximately 3000 were African/Black students (Star, 2007)

Table 5.1 demonstrates the number of matrics that wrote and passed Physical Science on a Higher Grade in 2000 and 2005.

Table 5.1: Examination results for Physical Science, 2001 and 2005					
	Year	Number of candidates that wrote exam	Candidates passing subject	Number of candidates that wrote on higher grade	Candidates passing on higher grade
Physical Science	2001	153 847	68.6%	24 280	15.8%
	2005	181 828	71.1%	45 652	25.1%

Source: Shindler, 2004; DoE 2005d (DoL, State of Skills, 2006)

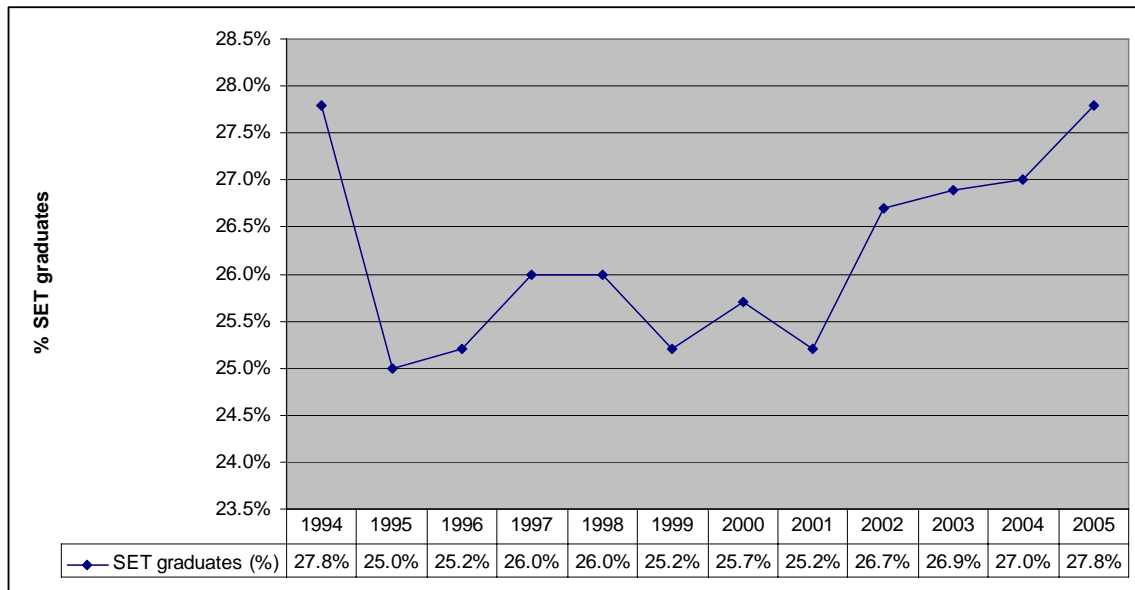
The pass rate for Physical Science rose by approximately 3% between 2001 and 2005.

Science, engineering and technology (SET)

SET graduates are key skilled workers who support economic growth and investment in social infrastructure. The current rate of graduation in this sector is a reflection of future prospects for the economy.

Figure 5.3 demonstrates the percentage of students that graduated in science, engineering and technology related disciplines of study for the period 1994 to 2005.

Figure 5.3: SET student pass rate 1994 - 2005



Source: Development Indicators, 2007-10-03

There has been a dramatic improvement in the percentage of students that passed SET related study fields during 1995 and 2001, after the pass rate dropped by nearly 3% between 1994 and 1995. Since 2001, the rate has increased back to 27.8% which compares with the 1994 pass rate.

FET AND HET SUPPLY

Pokroy (date unknown) states that South Africa is suffering from a drastic skills shortage predominantly in the science and technology sectors. Reasons for this include school leavers not becoming engineers or going into the science and technology arena, graduates not furthering their studies in the science and technology arenas and the over supply of university graduates in the social and other sciences with few if any of these being in the required science and technology sectors.

Sasol media manager Johan van Rheede stated in 2005 that Sasol needed to bring in skills from overseas for major projects, not because South Africa lacked the relevant skills, but because the quality of those skills was so poor that people would need to be retrained.

Speaking at a recent skills conference, the director of the UCT's Development Policy Research Unit, Dr Haroon Borhat, said that the skills shortage in South Africa could be attributed to insufficient technical training at company-level as well as at educational institutions. School learners performed poorly in key study areas, such as mathematics and science. The enrolment of large numbers of students, instead of focusing on the quality of education, exacerbated the problem (Le Roux, 2007).

Sandra Burmeister, the CEO of Landelahni Recruitment Group, says that what is worrying is the high level of dropouts at tertiary level.

The government's vision is for colleges to provide alternative study courses and training opportunities beyond school and enable jobless adults to acquire new skills. FET colleges need to become modern, responsive institutions, differentiated according to national and provincial priorities, with a key role in skills development and high quality vocational programmes. This can be achieved by bolstering college resources, reworking courses to respond to skills needs, constructing a coherent framework of qualifications that bridge those offered by schools and higher education, growing participation in FET and improving the performance of both learners and colleges. One concern is that funding will be redistributed away from HET institutions to FET institutions in favour of further education.

The focus on the school-level curriculum has disappointed some who are looking at FET colleges to help South Africa train more skilled workers. FET colleges serve two masters, the education and labour departments. Developing training programmes for artisans and other workers who should be trained through the colleges has been left to the labour department and SETAs whilst the education department is working on making the curriculum it is designing acceptable to Higher Education SA (Hesa), the umbrella body for South Africa's universities and universities of technology. The mismatch between the work done by the two government departments has perhaps caused more confusion.

The problems encountered at primary and secondary educational levels have a direct bearing on what is happening at tertiary level. There is very little higher education can do to correct things if school leavers arrive at university poorly educated. Half the country's undergraduate students drop out without completing their degrees and diplomas and only 30% obtain their qualifications within five years of enrolling as first-year students. Inadequate academic preparation and financial difficulties are the two key reasons advanced for the high dropout rate.

FET and HET data

Data was extracted from several reports and the Higher Education Management Information System (HEMIS) database which reflect the movements and trends of registration and graduation over the past decade pertaining to transport related studies. As information is not available to identify which specific fields of study feeds the transport sector in particular and on an exclusive basis, and accepting that many fields of study probably serve this purpose, the data is a reflection of a variety of disciplines grouped together. Study fields analysed below include these CESM and FET codes:

- 0801 Aerospace and Aeronautical Engineering and Technology

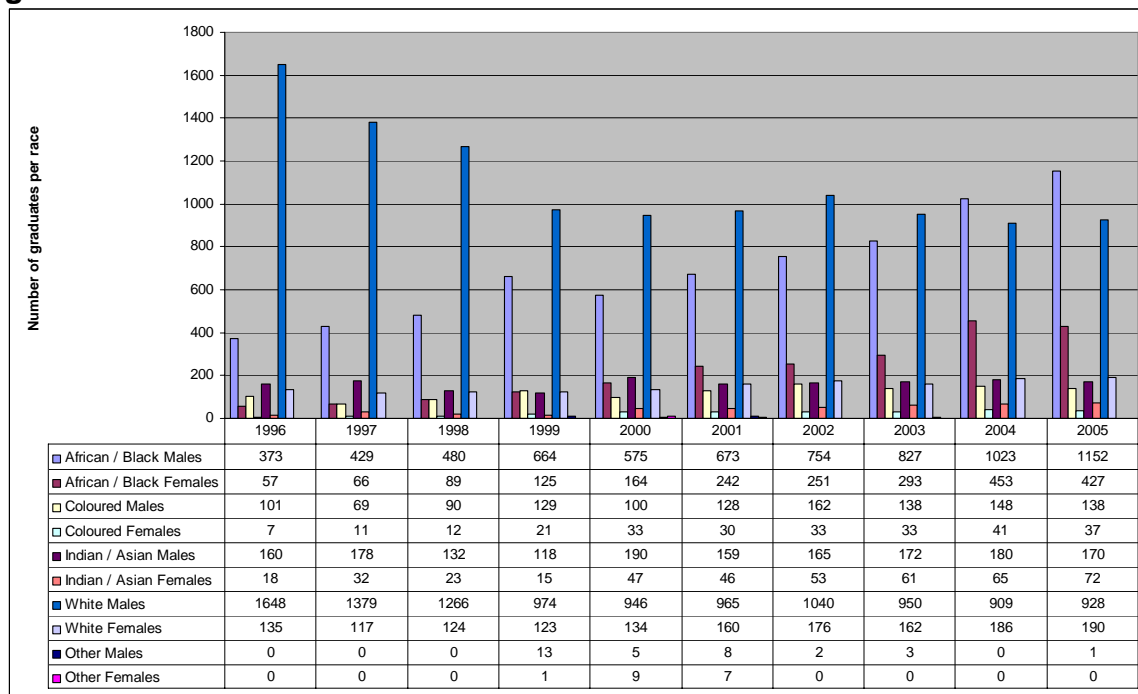
- 0802 Agricultural Engineering and Technology
- 0803 Automotive Engineering & Technology
- 0805 Chemical Engineering and Technology
- 0806 Civil Engineering and Technology
- 0809 Graphics & Drafting for Engineering & Technology
- 0810 Engineering Mechanics
- 0811 Engineering Science
- 0812 Environmental Engineering & Technology
- 0817 Marine Engineering and Naval Architecture
- 0819 Mechanical Engineering and Technology
- 0825 Surveying and Mapping
- 1106 Transportation

Although the fields of study cover a range of engineering, technology and transport related disciplines, it provides some insight into trends of supply-side factors which influences the levels of shortages experiences in the transport sector.

Engineering and Transportation graduates distributed by race and gender

Figure 5.4 reflects the number of engineering and transportation students that graduated from universities and Technicons (Universities of Technology) by race and gender over the past decade.

Figure 5.4: HET Graduates in Engineering and Transportation by race and gender 1996 - 2005



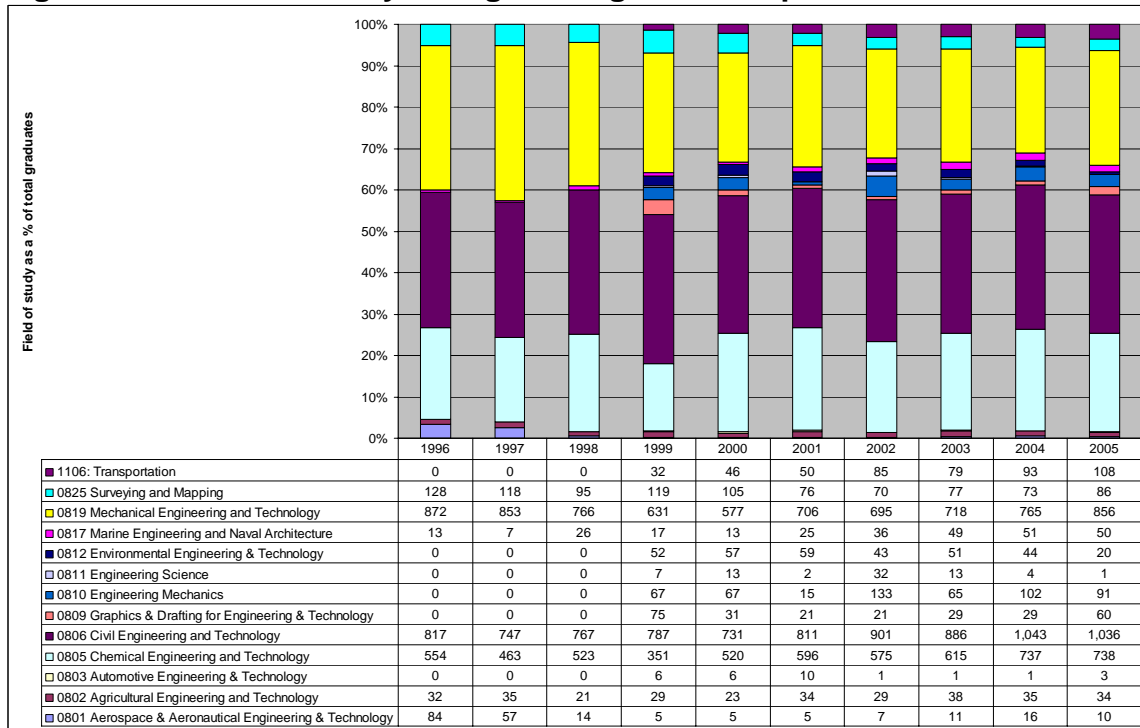
Source: HEMIS

The number of African/Black graduates increased with an average of 77% based on the number of graduates in 1996 opposed to the number in 2005, followed by 54% of Coloureds and 41% of Indian/Asian graduates. Although White female graduates increased by 77%, White males decreased by 78%, which provide for an average decrease of 24% comparing the numbers for 1996 and 2005. With regards gender, and comparing 1996 and 2005, African/Black females increased by 87%, followed by Coloured females (80%), Indian/Asian females (75%) and African/Black males (68%). Coloured male graduates increased by 27% and Indian/Asian males by 6% only.

Engineering and Transportation graduates distributed by race and gender

Figure 5.5 reflects the fields of study that contributed to graduate output from universities and Technicons (Universities of Technology) over the past decade.

Figure 5.5: Fields of study in engineering and transportation 1996 - 2005



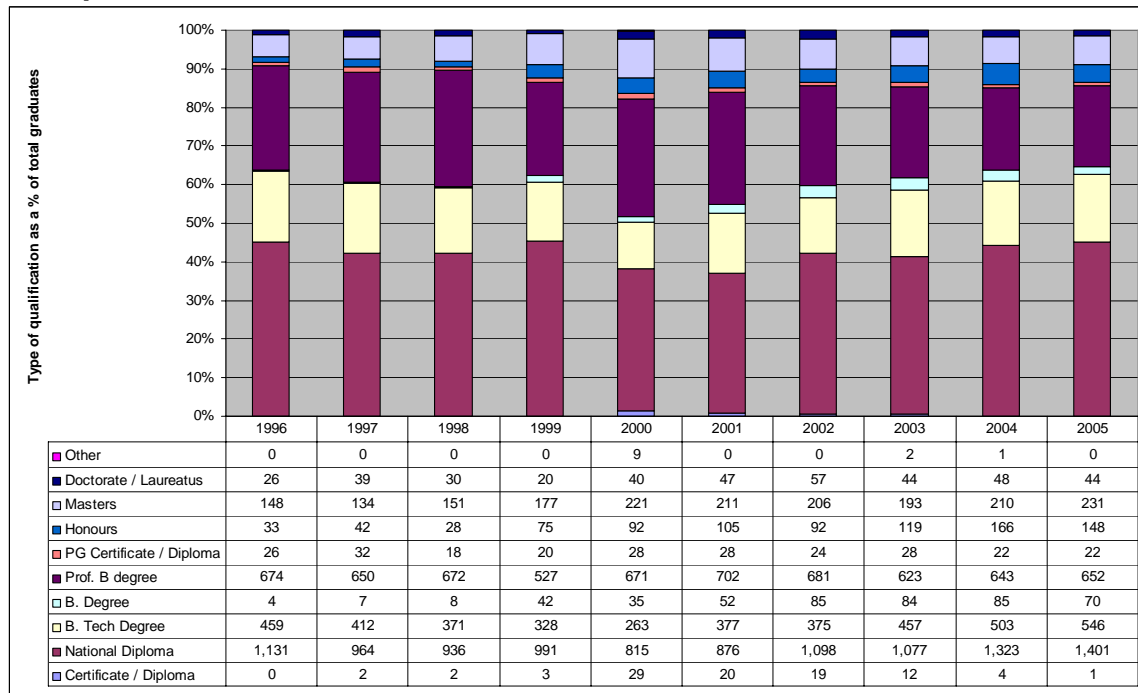
Source: HEMIS

The most preferred field of study was Civil Engineering and Technology with an average graduate output across the period 1996 to 2005 of 34% of the total graduate output. Second in line was Mechanical Engineering and Technology by 30% and third was Chemical Engineering and Technology. Between these three fields of study, they produced more than 80% of the engineering and transportation graduate output.

Engineering and Transportation graduates distributed by race and gender

Figure 5.6 reflects the types of engineering and transportation qualifications which graduates obtained as output from universities and Technicons (Universities of Technology) over the past decade.

Figure 5.6: Types of qualifications obtained in engineering and transportation 1996 - 2005



Source: HEMIS

National Diplomas provided for 42% of the qualifications obtained, whilst B. degrees and B. Tech. degrees provided for 26% and 16% respectively. These three types of qualifications provide for over 80% of all qualifications related to engineering and transportation fields of study. Masters degrees (7%) and Honours (4%) degrees provided for another 10%, with the rest of the types of qualifications making up the residual.

Attrition rates

Table 5.2 reflects the attrition rates in HET institutions, for the period 2000 – 2004. Unfortunately similar data could not be obtained for earlier and later years pertaining to this study.

Table 5.2: Attrition rates in HET 2000-2004				
Institutions	First-time undergraduates in 2000	Dropped-out by 2004	Graduated by 2004	Not completed by 2004

Universities	38 407	38%	50%	12%
Technicons (Universities of Technology)	43 484	58%	32%	10%
Distance Education	37 798	71%	9%	20%

Source: The Minister of Education released these figures in a written answer to a question in Parliament, September 2006

It is evident that more students graduate from universities than they do from Technicons or distance learning facilities. On average, approximately 55% of all students do not complete their studies.

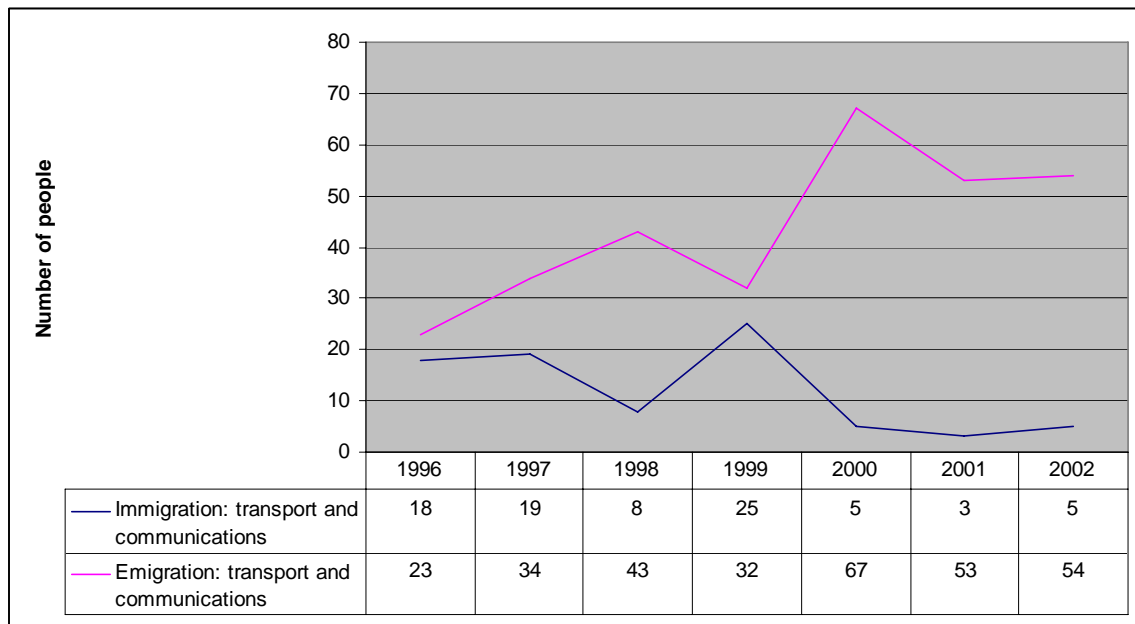
IMMIGRATION AND EMIGRATION

There is no specific information available, apart from that reflected in the Figure below, on the number of transport professionals who have left the country, on contract or permanently, nor on professionals entering the country for the transport sector. The data source also does not specifically state the content of “transport and communications” in terms of occupational categories.

It is assumed that most of the relevant migration figures are embedded in die broader categories for professionals and managers. StatsSA has also recognized the possibility of statistics supplied for migration may be underestimated by as much as 57%.

Figure 5.7 reflects the influx and exodus of transport and communications occupations as provided by StatsSA.

Figure 5.7: Transport and communication migration 1996 - 2002

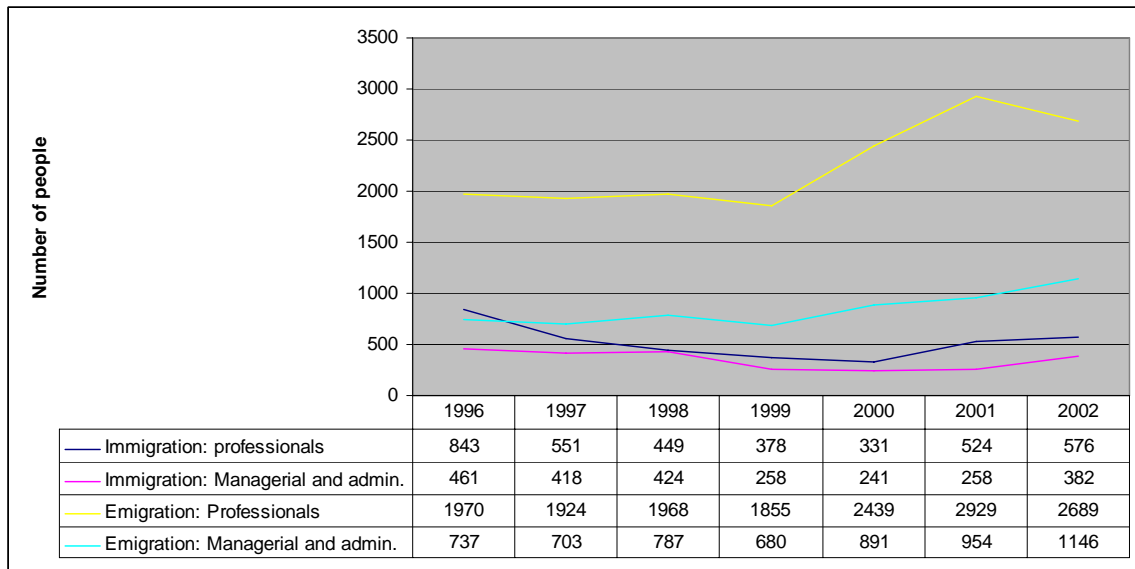


Source: StatsSA, Tourism and migration 1994-1996 (report 03-51-01) and Documented migration (Report 03-51-03)

In some instances, especially since the start of the new millennium, the number of people leaving the country seems to be up to ten times more than those that enter. However, as previously mentioned, it is believed that most of the transport specific professions are perhaps embedded in general immigration and emigration statistics.

Figure 5.8 provides more information on trends associated with professionals and managerial/administrative occupational movement.

Figure 5.8: Professional and Managerial/Administrative migration 1996 - 2002



Source: StatsSA, Tourism and migration 1994-1996 (report 03-51-01) and Documented migration (Report 03-51-03)

In some instances the number of people emigrating is up to four times more than those entering the country.

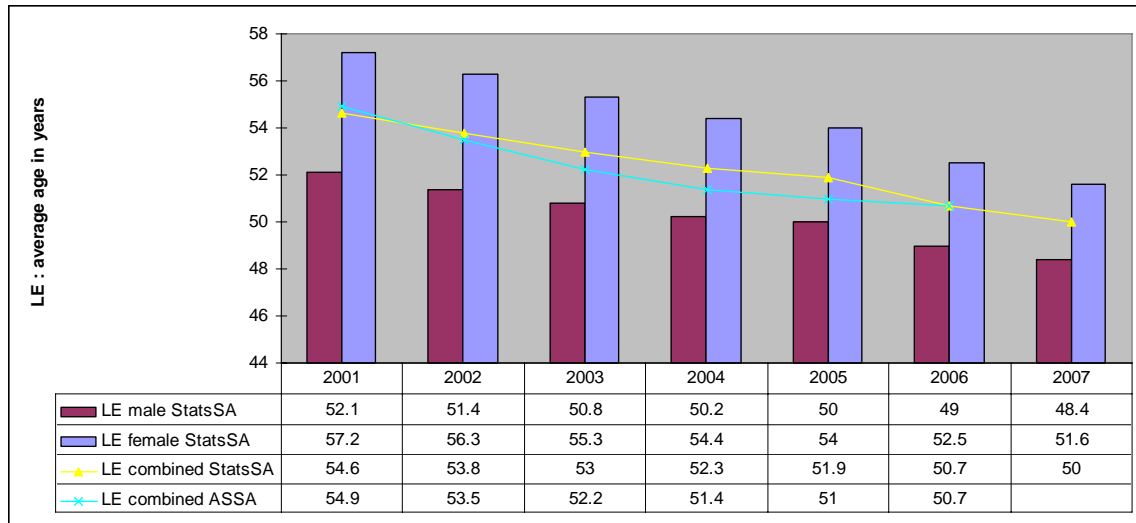
It is also noted that official figures apparently do not record all emigration. A study by the University of Cape Town found that between 1989 and 1997 more than 233 000 people emigrated to the five most common destinations. This was nearly three times the official figure, apparently including those leaving under the pretext of temporary visits.

LIFE EXPECTANCY

One other factor that needs to be noted and which impacts the availability of future skills is HIV/AIDS and the negative population growth rate prevalent in the country today.

Figure 5.9 demonstrates present life expectancy (LE) rates in average expected age obtained from StatsSA and the Actuarial Society of South Africa (ASSA).

Figure 5.9: Life expectancy (RSA) 2001 - 2007



Source: Source: Development Indicators, 2007-10-03

The life expectancy is declining rapidly. Presently males are expected to live to 48 and females to 51. The tragedy of these statistics is that it is not due to a lowering of the birth rate but rather due to a massive increase in the death rate. This has a significant effect on the economy as many of the people that are dying are in the economically active age bracket. The impact on skills development is two-fold. Firstly, skilled workers are being lost to the pandemic and thus the pool of workers is shrinking. Secondly, companies may become more hesitant to invest in training and development as the number of trained workers disappear (DTI, 2006).

OTHER SUPPLY-SIDE FACTORS

Sector Education and Training Authorities

The Skills Development Act, 1998 provides a framework for the development of skills in the workplace and makes provision for this by means of a levy-grant scheme and the establishment of 27 sector-specific SETAs to administer the scheme's funds and manage the skills development process. SETAs were established on 20 March 2000 and are responsible for the disbursement of training levies payable by all employers in the country. SETAs replaced and extended the work of the industry training boards which existed previously, and are accredited by the South African Qualifications Authority (SAQA).

Each economic sector has its own Seta which is ultimately responsible for the development and implementation of a skills development plan, quality control and

payment of development grants. The Transport Education and Training Authority (TETA) needs to ensure that the skills requirements of the transport sector are identified and that adequate and appropriate skills are readily available (for both new and existing sector staff) through training of an appropriate quality, and against agreed standards. TETA also has to provide a learnership programme and implement strategic sector skills plans.

The SETAs failed to accomplish its mandate of empowerment and education by not utilizing its budget effectively and not identifying skills shortages efficiently enough. SAQA revealed that in September 2003, only 17% of graduates from Seta-funded learnerships received the certificates to which they were entitled. Data from the National Skills Authority indicated that only 9 502 of the total of 70 000 learners enrolled since the system was implemented in March 2001 had completed their learnerships by June 2004 – a completion rate of 14% in three years for courses that typically last one year each. A research publication of the Human Sciences Research Council, *An Overview of South African Human Resources Development*, indicated in 2004 that the quality of the training funded by SETAs was questionable as “...much of the training was of the short-course variety and narrow in focus to meet specific employer requirements. It included training of the ‘soft’ variety – for example, training in health and safety issues or on industrial relations – and far less of the hard variety that would lead to whole qualification acquisition and significant upskilling of the workforce along the National Qualifications Framework.”

SUMMARY

This chapter focused on supply side factors influencing the perceived skills shortage pertaining to transport professionals in South Africa. From the figures and related information it is evident that the schooling system firstly does not produce sufficient numbers of potential students in mathematics, and most probably science and technology. Secondly, because of a lack of detailed data, it cannot be established how many of the successful graduates do indeed eventually join the transport sector.

The transport sector, because of its need for knowledge and skill in subject areas such as mathematics, physical science, technology and engineering, competes with most other professional disciplines in the pool of potential resources becoming available through training institutions.

In particular, the following factors contribute to the shortage in skills experienced:

- Only 66.5% of candidates that wrote matric passed in 2006
- The number of matrics that passed higher grade mathematics in 2006, constitute only 7% of all candidates that wrote and passed matric with only approximately 3000 being were African/Black students
- Only 27.8% of all students graduates from SET fields of study on 2006

- African/Black graduates in engineering and transport related fields of study increased by an average of 77% since 1996 whilst White males decreased by 78% - most graduates are male
- National Diplomas provided for 42% of the qualifications obtained, whilst B. degrees and B. Tech. degrees provided for 26% and 16% respectively. These three types of qualifications provide for over 80% of all qualifications related to engineering and transportation fields of study
- More students graduate from universities than they do from Technicons or distance learning facilities but on average, approximately 55% of all students do not complete their studies
- In some instances the number of people emigrating is up to four times more than those entering the country.
- The life expectancy is declining rapidly with the average life expectancy of males being 48 and females being 51 years due to a massive increase in the death rate - the transport, storage and communications sector has been identified as a high risk sector in terms of the prevalence of HIV/AIDS

CHAPTER 6

This chapter reflects on the impact in the medium and long term if skills shortages are not addressed and reviews past, current and future initiatives to address the state of skills.

IMPACT OF SKILLS SHORTAGES

Introduction

To begin to understand the present shortage of skills in the country, it is necessary to acknowledge its origin – the depth of damage done by apartheid education. It is, however, also necessary to acknowledge the share of costly damage done in the past thirteen years in (the lack of) skills development that has resulted in the appearance of gaps where there were none before.

The Centre for Development and Enterprise (2007) conducted a survey with chief executive officers and/or senior company officials of businesses in Gauteng in manufacturing and mining, retail and services, on the South African skills crisis. The following is an extract from the main findings in the report pertaining to the reasons perceived to be at the centre of the present skills shortage. Most of these align to the findings presented earlier in this report and therefore indicate definite trends which contribute to the skills shortage:

- a) Schooling:
 - A decline in school leavers' abilities in mathematics, science and language skills
 - "No work ethic"
 - Lacked the ability to be trained
 - Standards - especially language skills - were slipping
 - Lack of discipline and culture of learning
- b) SETAs:
 - Dealing with SETAs is too cumbersome
 - Assessors are poorly trained
 - The training too theoretical and do not meet market needs
- c) HET:
 - Uneven standards between universities
- d) Global competition
- e) Emigration of skilled people
- f) Ageing of skilled staff
- g) Movement of staff to more senior positions
- h) Government interventions:

- Growing emphasis on employment equity is making the skills market tighter because the most skilled people - whites - are no longer freely employable

Although the companies surveyed did not include transport sector companies, the above-mentioned are applicable to the general business base of South African companies and employer organisations.

This chapter debates some of these reasons as well as the impact of these in the medium and long term. The chapter also reviews the initiatives that have already been put in place as well as those that are planned for the future to address these challenges.

PAST, PRESENT AND FUTURE INITIATIVES TO ADDRESS SKILLS SHORTAGE

National Skills Development Strategy

The principles of the National Skills Development Strategy include:

1. Support economic growth for employment creation and poverty eradication.
2. Promote productive citizenship for all by aligning skills development with national strategies for growth and development.
3. Accelerate Broad Based Black Economic Empowerment and Employment Equity. (85% Black, 54% women and 4% people with disabilities, including youth in all categories). Learners with disabilities to be provided with reasonable accommodation such as assistive devices and access to learning and training material to enable them to have access to and participate in skills development.
4. Support, monitor and evaluate the delivery and quality assurance systems necessary for the implementation of the NSDS.
5. Advance the culture of excellence in skills development and lifelong learning.

Joint Initiative for Priority Skills Acquisition (Jipsa)

JIPSA comprises a Joint Task Team, made up of key Ministers including the Ministers of Labour, Education, Science and Technology and Trade and Industry, as well as business and union leaders, and a Technical Working Group consisting of education and training experts from government, organized labour and academia. It is a vehicle established to address one of the 'binding constraints' – i.e. skills – on the Accelerated & Shared Growth Initiative for SA (AsgiSA). It has identified many skills crisis relating issues as fundamentally arising from a systems malfunction characterized by bottlenecks and quality issues, which include matters such as ageing, retirement of skilled workers, mentoring and coaching and replacement practices.

JIPSA works with existing institutions to identify priorities, address bottlenecks and constraints, and mobilize high-level leadership and resources to achieve key goals. JIPSA has identified five main areas for targeted intervention:

- High level, world class engineering and planning skills for the ‘network industries’ – transport, communications, water, energy
- Town and regional planning skills
- Engineering and intermediate artisan and technical skills, with priority attention to infrastructure development
- Management and planning skills in the education and health systems
- Mathematics, science, ICT and language competence in public schooling

In addition, JIPSA is concerned with the problem of unemployed graduates and ICT skills priorities.

An initial analysis conducted by JIPSA, suggests the key issues in terms of a ‘skills pipeline’ are:

- Improving throughput rates in engineering faculties
- Increasing outputs
- Increasing the proportion of engineering graduates who become registered professionals
- Mentoring of junior engineers
- Retention of experience within the engineering profession
- Re-hiring of retired engineers
- Importation of priority skills and expertise

Current JIPSA proposals are focused on:

- Increasing the ‘yield’ of graduating engineers from Higher Education
- Strengthening the pathway from graduation to professional registration
- Importation of priority skills
- Programmes to re-skill graduates whose qualifications are not in demand, e.g. as teachers, managers etc.
- Programmes to up-skill graduates whose qualifications are perceived as below par
- Work orientation programmes for current students and graduates – focus on ‘soft’ skills, and include ‘work fairs’ where employers can showcase their firms and recruit

In addition, JIPSA are involved in high level discussion to address:

- Planning and management capacity in the school system
- Maths, science, ICT and communications in schools
- Finalization of the National Qualifications Framework (NQF) Review

- Clarification of training pathways, and the place of apprenticeships, learnerships and FET college programmes within a coherent skills framework
- Governance, management, efficiency and performance of SETAs
- Availability and reliability of relevant statistics
- Quality issues, and high levels of wastage across all levels of the education and training system
- Coordination challenges – for instance between government departments, SAQA and other QA bodies, the National Skills Authority and SETAs
- ‘Size and shape’ of FET and HET

Technology outReach Activity Centre (TRAC) South Africa

TRAC is an outreach programme whose main industrial partners are the South African National Roads Agency Limited (SANRAL) and the National Department of Transport, with a focus on the promotion of science, engineering and technology education with a slant towards the transport sector (Duff-Riddell, 2004).

Transportation covers a very broad range of activities, including land, air, and sea transport infrastructure design and construction, through transport planning and logistics, to freight and passenger transport by a wide variety of modes ranging from the pedestrian to supersonic jet aircraft (Duff-Riddell, 2004). A range of skills is required, from unskilled labour through to extensive mathematics, science and engineering skills, economics and hydraulics.

The TRAC programme is a syllabus-based science support programme that seeks to enable and encourage learners to enter science, engineering and technology careers with transportation being used as a source of examples of the application of the school syllabus.

Problems identified with the implementation of the programme at school level and which have recently being addressed by TRAC include:

- The need to support teachers struggling with the subject matter at syllabus level; and
- The need to provide practical application of the science to highlight job opportunities to the learners.

TRAC together with the DoT provides an intern bursary system and tracks the learners exposed to the programme to try and guide a few of them towards studies in transportation for which DoT bursaries are available. In addition, regular road shows and exhibits are held around the country where learners are exposed to the transport industry.

Thuthuka Maths and Science Development Camp Project

A joint initiative between the science and technology department of government and the South African Institute of Chartered Accountants (Saica), has seen the establishment of the Thuthuka Maths and Science Development Camp Project aimed at helping learners obtain better marks by improving their aptitude in mathematics, science, accounting and English. Over the next five years, more than 2 400 Grade 11 and 12 pupils will benefit from the project, worth R25m.n The project is rolled out in the Eastern Cape, Gauteng, KwaZulu Natal, Limpopo, Western Cape and Free State. Of the Grade 12 learners in all the camps, the top 100 pupils would be awarded bursaries of an undisclosed value to study at a higher institution. Presently only 2% of the scientific community is made up of Blacks (Motsoeneng, 2005).

Importation of skills

Realizing the extent of the crisis, and in an endeavour to respond to it, both President Thabo Mbeki and Deputy President Phumzile Mlambo-Ngcuka have suggested importing the required skills from the international community, including Africans in the Diaspora. Similarly, Home Affairs Minister Nosiviwe Mapisa-Nqakula has stated that she is determined to have new immigration regulations that ease importing skills.

Pokroy (date unknown) mentions that where there is a current shortage of specific skills and little prospect of filling the skills shortage in the short to medium term with homegrown talent, one of the acceptable international norms for securing such skills is to import skilled foreign nationals. This is an interim measure calculated to achieve various goals, amongst others:

- Supplying these needed skills in the short to medium term; and
- Utilizing the skilled foreigners to transfer skills and mentor South Africans in respect of those skills.

The scarce and critical skills list sets out quotas agreed by the Department of Home Affairs, the Department of Labour, and the Department of Trade and Industry for the importation of skills to South Africa by way of immigration (Le Roux, 2007). Besides relevant qualifications, at least five years' relevant experience is also required. Despite the quotas and the pressure on government and private companies to deliver local projects, inefficiencies in the South African immigration system and delays in implementing the amended Immigration Act, together with delays in obtaining approvals from the Department of Home Affairs, are hampering the import of skilled personnel. Where large projects are concerned, it takes between 6 months and 18 months to obtain the required approvals for work permits for skilled foreigners to be approved by the Department of Trade and Industry and the Department of Home Affairs.

One of the suggestions made to alleviate the timeline for appointing foreign skills, is for the various government departments involved in the work permit approval process to appoint within their ranks industry specialists. These specialists will understand the nature of the skills that the foreign managers, engineers and artisans require for specific projects. Skilled immigrants who enter South Africa do so under strict conditions. The skills of the person must be validated by the South African Qualifications Authority. Moreover, the person needs to receive a police clearance certificate and the company that brings the person to South Africa must provide guarantees that the person will be repatriated after a set period of time (Le Roux, 2007).

Bursaries and learnerships

Bursaries, learnerships and other incentives can encourage potential employees to study in appropriate technological and other relevant study fields.

SAA is sponsoring learners at the Waterkloof High School in Pretoria in Aeronautics as a matric subject. In addition, discussions are taking place to involve the SAAF in establishing a Flight Academy with government support. Presently the SAA is solely responsible for training cadet pilots (Die Burger, 2006).

The SAAF and Navy offer a multitude of opportunities which include bursaries for engineering studies and skills development programmes for apprentices in fields such as mechanical, electrical and electronic technicians (Star, 2007, p6)

Several enterprises included in the survey mentioned that they have established in-house training centres to address skills development issues internally.

Retention matrix

A sourcing company has successfully implemented a retention matrix for senior black professionals and managers. The retention strategy has been developed overseas by a company called Lominger International in the USA, and entail in short conducting a comprehensive analysis of executive and senior staff to determine categories: (i) low level performer; (ii) reliable professional; or (iii) future star. Thereafter each person is subjected to a customised training programme to address the specific needs for each level. In this manner, companies can ensure that they retain for instance top achievers and future stars by exposing them to the correct level of challenge, knowledge, achievement, etc. (Ueckermann, 2007).

Employment equity policy

The South African Institute of Electrical Engineers (SAIEE) has proposed a change to the current black economic-empowerment (BEE) point system,

suggesting that less emphasis be placed on employment equity, in favour of skills development (Moodley, 2007). The SAIEE president suggested that the first step in addressing the skills issue will be to use the National Scarce and Critical Skills List to identify and categorize companies relying on the scarce skills as Scarce Skill Sector (SSS) Companies. This should be followed by an adjustment to the present distribution of points on the broad based black economic-empowerment (BBBEE) scorecard to emphasize skills development in these companies. The institute added that moving some of the points presently allocated to management-and-employment equity areas, to skills development would achieve this. Thus, companies whose success hinges on particular scarce skills would be significantly incentivized to 'grow' more of these skills internally without threatening non-BEE skills already in place.

SAIEE pointed out that such a system would underscore the need for currently highly-qualified people in the country to mentor and assist with skills development. It would also help to dispel demoralization of spirit owing to the perception that there is no future for incumbent skilled people such as engineers. The latter has fed emigration and the serious drain on South Africa's technical base.

Other transport sector specific initiatives

Beyond providing the secretariat for the Joint Initiative on Priority Skills Acquisition (Jipsa), the National Business Initiative (NBI) is actively involved in an initiative in which six of South Africa's largest companies, Sasol, ArcelorMittal South Africa, Anglo Platinum, Gold Fields, Eskom and Transnet, all of which have combined forces as the Technical Skills and Business Partnership to tackle the national skills shortage (Le Roux, 2007). The working group facilitated by the NBI has been set up under this initiative, and a plan is currently being prepared to restock and stock up the South African economy with artisan, technologist, technician and engineering skills, through making a significant investment in training facilities and educators.

The Sasol, ArcelorMittal South Africa, Anglo Platinum, Gold Fields, Eskom and Transnet working group has compiled a framework document that is taking into account the current requirement for skilled personnel in South Africa, the quality of skills available and the nature of the labour market. The companies will act as anchor companies in their different industry sectors to involve other relevant companies that were not part of the initiative from the beginning. If the plan were accepted by JIPSA, implementation and roll-out would start by the beginning of 2008 (Le Roux, 2007).

Another initiative of five construction companies Murray & Robberts, Aveng and Grinaker-LTA, Basil Read, Group Five, and WBHO focuses on public further education and training (FET) colleges. A memorandum of understanding between the five listed companies, the Department of Education and the NBI was

signed in November 2006. The intent of the memorandum of understanding is to indicate the commitment of the partners to deepen the foundations for an ongoing, mutually beneficial partnership between FET colleges and the civil engineering and construction industry to build an expanded, high-quality skills base to meet the needs of the industry and the country. The vision of the partnership is to develop selected colleges into centres of excellence in the field of education and training for the building and civil construction industry and for the colleges to become preferred providers of well-trained and educated personnel for the industry (Le Roux, 2007).

Further initiatives which have not been mentioned elsewhere include:

- Implementing mentoring programmes – several initiatives especially on a local government level have been launched to support young and inexperienced staff by linking them up with experienced older retirees with the view of establishing medium-term mentorship and coaching programmes;
- overseas placement of trainees to fast-track development – several South Africans have already been placed through nationally driven exchange programmes in several countries across the world where they are mentored and coached and exposed to advanced methods of working to enable them to bring those acquired skills back to South Africa;
- developing and implementing special training programmes both with the workplace and through training institutions;
- utilizing retirees to on the one hand mentor young inexperienced professionals and on the other hand assisting with workload on a contract basis;
- bringing back expatriate South Africans – there is a huge drive to attract expatriates to South Africa;
- drawing on new immigrants through global advertisement and exchange programmes; and
- re-implementing apprenticeships.

WHAT STILL NEEDS TO BE DONE?

According to the SA Employment Report (Schussler, 2006) South Africa needs to create about 60 000 jobs a month if unemployment is to be halved by 2014. The formal sector is currently growing at about 30 000 new employees a month. On the country's skills shortage, Schussler (2006) said that SETAs were not focused on small companies, which were most job growth was coming from. Large companies contributed about two percent to employment growth in 2005. He said government should aim its policies at smaller firms given that the average number of employees in firms had dropped from 35 in 1980 to 13 in 2000. Whereas in the 1970s and 1980s it was public sector companies which had created employment, the private sector was now responsible for growth.

Another option to alleviate the skills shortage is to implement strong and progressive mentorship programmes. Instead of employing expensive experienced blacks, organisations can perhaps pair up experienced white candidates (on a contract basis) with promising black ones “for the price of one” through a structured mentoring programme until such a black candidate is capable to continue on his/her own (Workplace correspondent, 2007)

The Immigration Act, 2002, although amended twice, still hampers the import of skills for purposes of alleviating the present shortage. Since July 2005, a person could apply for permanent residence if he/she had been offered a permanent post and falls within the annual quotas set by the Minister of Home Affairs. In addition, to qualify for permanent residency, based on employment, the person either has to fit into one of the quotas or have extraordinary skills (Watters, 2006).

SUMMARY

This chapter reviewed all the main initiatives implemented by government and other role players in the transport sector and also briefly addressed what still needs to be done.

The main initiatives include JIPSA, TRAC, the Thuthuka Maths and Science Development Project, migration initiatives and the DoH’s quotas, a bursary scheme, learnership programmes and a retention matrix.

CHAPTER 7

This chapter summarizes the key findings and highlights labour market challenges for the future.

FUTURE TRANSPORT SECTOR LABOUR MARKET CHALLENGES

The DoT's Public Transport Strategy (2007) contains several future initiatives which will further impact skills requirements.

The infrastructure being erected for the 2010 Soccer World Cup will require new jobs in security, customer service, fare collection, maintenance, etc. for 2010 but also long after 2010.

Other planned initiatives related to multi-modal integration will create road and rail trunk corridors with feeder systems, transfer systems (public space, pedestrian and wheelchair friendly movement), bicycle feeder networks, metered taxis, motorised two and three wheelers, long distance public transport terminals (long distance coach and rail services), park and ride lots for cars, etc. All of these will place additional demands for suitable skills on all transport related occupational categories.

Some of the long term planned initiatives in the transport sector include:

- 2014 Integrated Rapid Public Transport Networks – operating systems in place in 12 cities, at least 6 rural districts
 - 6 metropolitan cities and 6 smaller cities, 6 rural districts
 - Covers 18 of the 53 metropolitan cities and districts
- 2020 Over 85% of a metropolitan city's population within 1km of an Integrated Rapid Public Transport Network trunk (road and rail) or feeder (road) corridor
- 2020 Mode shift of 20% of car work trips to public transport networks
2003 – 1.85m workers used a car to work in metropolitan cities / assume doubling of this to 3.7m in 2020 – aim to attract 750 000 (20%) of these to public transport networks

The National Freight Logistics Strategy, which was introduced in 2005, introduces a new framework for freight transportation for both road and rail indicating the need to shift appropriate freight to the appropriate mode. Transnet focuses on bulk and DoT on branch-lines. This presents road freight diversification opportunities for the future (Mpofu, 2007).

These and other initiatives require skills such as or relevant to:

- local capacity for planning, monitoring, regulation and network management which skills can probably be provided through TETA, Transport Centres of Development, other institutions of Higher Learning, etc.
- minibus/small bus operators and drivers
- law enforcement, inspection, investigation and prosecution capacity
- business planning
- planning, managing, promoting, regulating, enforcing and monitoring contracts
- rolling stock maintenance

FUTURE GENERAL LABOUR MARKET CHALLENGES

The DoL's Programme of Action for 2004-2009 raises several challenges that still needs to be addressed from a labour market perspective (DoL, 2004: 19-20).. These include:

1. The economy continues to reveal dual characteristics. On the one hand, the "first" economy has an advanced, industrialized face which is well developed, employs people who are skilled, is technologically driven, upholds labour standards, and is globally competitive. On the other hand, the country has a "second" economy which in many cases is structurally disconnected from the first, with high levels of poverty, limited access to knowledge, technology and markets as well as poor labour standards and informal work relations.
2. The legacy of structural unemployment, which is one of the starkest indicators of the welfare challenge facing the country, has two notable features with regards to the unemployment crisis. Firstly, the unskilled are simultaneously most likely to be the first to lose their jobs in periods of employment contraction, and least likely to be hired in periods of employment expansion. Secondly, the youth, which currently constitute 70 per cent of the unemployed, are the dominant, identifiable portion within this group of long-term unemployed individuals.
3. Inequalities and discrepancies are still in place regarding ownership, shareholding and management, all of which remain dominated by White males. Black people, women and people with disabilities remain marginalized in relation to meaningful and influential participation in the economy.
4. The changing nature of work is a result of the increased propensity amongst employers to switch away from permanent and full time employment toward atypical forms of employment such as casual labour, part-time employment, temporary and seasonal work. Outsourcing and subcontracting is also on the rise, as the pressures of greater international competitiveness are felt by domestic firms.
5. Domestic as well as cross-border migration is on the rise which bears the risk of increasing the numbers of unemployed people in large urban centres, with the concomitant greater pressure on public services and

- utilities. Domestic migration describes a phenomenon whereby people from rural areas, mostly unskilled, migrate to urban areas in search of employment. Cross-border migration refers to economic refugees, both legal and illegal, who have left their country and settled in the urban areas of South Africa, hoping to find employment.
6. Key economic policies of government need to be in harmony with one another and be mutually re-enforcing in promoting growth, reducing unemployment and eradicating poverty

In addition, a number of key global trends shape labour market requirements:

1. Globalization - transport and telecommunication advances have contributed to the creation of a "global village" resulting in countries and people being closer together, whilst competing in the global economy. Local companies therefore have to compete with companies from other countries that can export goods to South Africa at cheaper prices, as well as compete in major export markets such as automotive manufacturing and trade in livestock.
2. Technology- increased use of ICT (information and communications technologies) have led to jobs that are information-oriented and require higher level technical as well as generic skills (for example, communication-, writing-, learning-, and computer literacy skills). Increased use of machines to replace workers has also led to more industries needing a smaller pool of highly skilled workers, instead of a large pool of lower-skilled workers.
3. New forms of work organisation - companies need to be able to respond quickly to fast-changing customer demands. In order to do this, they require workers who can make decisions, solve problems and take responsibility for their actions. The need for this flexibility has led to new forms of work including team-based production, and outsourcing certain parts of operations to outside individuals and smaller companies.

On a local level, the following specific initiatives and trends shape transport sector skills requirements:

1. Global climate change and greenhouse gas production - well-designed, well-run and sensibly planned public transport systems and infrastructure can play a key role in cutting climate change emissions. In addition, it can help improve air quality and bridge social and economic divides.
2. The Government's infrastructure investment, which will see R372 billion spent up to 2009 in preparation for the 2010 FIFA World Cup.
3. The development and introduction of alternative fuels and technologies, such as biodiesel, bioethanol and fuel cells.
4. The implementation of the high speed Gautrain project.
5. The development of the Coega aluminium smelter.
6. The development of Transnet's rail, harbour and petroleum pipeline.

7. Eskom's planned spend of about R84 billion on transmission, generation and distribution over the next five years.

SUMMARY

This study and the review of literature, market views, statistics and policy relating to the transport sector, lead the authors to the following conclusions:

1. There is a great need for accurate and detailed information pertaining to transport specific professional skills required. Current information is embedded in a defragmented manner in too many places and data bases.
2. The skills shortage in the transport sector and assumeably also on professional level is deep which provides for a scarcity in quality of skill level and numbers of skill.
3. The approach to skills is too narrow; the sector needs skills to create jobs as well as to fill vacancies.
4. New sets of skills will be required in addition to the existing ones considering the future initiatives and strategic priority focus areas planned for the sector and labour in general.
5. Global trends in skills shortages of a similar nature will deplete South African skills even more giving the present migration of skills if the country does not start progressively exploiting the global market for national interest.
6. Immigration policy and regulatory constraints should be addressed to enable the acquisition of global skills in a timely and more effective manner.
7. In terms of training provision, a need exists for learnerships, skills programmes, internships, practical workplace exposure and study at higher education institutions.
8. Current supply from secondary and tertiary institutions does not provide adequate skills sets required by the sector and are not aligned to address scarce skills in the sector - modes of delivery will require major adjustments.
9. Additionally, critical skills should be addressed in all training interventions.
10. The government should reduce its pressure for employment equity. Businesses are being prevented from utilizing highly skilled and experienced people because they belong to the wrong race group.

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APPENDIX 1: ACRONYMS

Acronym

AsgiSA	Accelerated and Shared Growth initiative for South Africa
CESM	Classification of Educational subject matter
DoE	Department of Education
DOL/DoL	Department Of Labor
DPLG	Department of Provincial and Local Government
HEMIS	Higher Education Management Information System
FET	Further Education and Training
FOODBEV	Food and Beverage Manufacturing Industry SETA
GEAR	Growth, Employment And Redistribution Strategy
HSRC	Human Sciences research Council
ICT	Information and Communications Technology
JIPSA	Joint Initiative for Priority Skills Acquisition
LRA	Labor Relations Act
MTEF	Medium Term Expenditure Framework
NGO	Non Government Organizations
NQF	National Qualifications Framework
OECD	Organization for Economic Co-operation and Development
OFO	Organizing Framework for Occupations
PDI's	Previously Disadvantaged Individuals
PFMA	Public Finance Management Act
SAQA	South African Qualifications Authority
SETA	Sector Education and Training Authority
SIC	Standard Industrial Classification
SMME	Small, Medium and Micro Enterprise
SOC	Standard Occupational Codes
SSP	Sector Skills Plan
StatsSA	Statistics South Africa
TETA	Transport SETA
WSP	Workplace Skills Plan

APPENDIX 2: SAMPLE OF ENTERPRISES

Transport, Storage and Communications Sector
Organizations included in sampling

N o.	Organization	Sub-sector	Additional description	Referral	Number of times contacted	Q completed Yes	Q completed No
1.	Commercial Aviation Association of Southern Africa (CAASA)	Air			5		No response
2.	Airports Company South Africa (ACSA)	Air			7	Yes (L)	
3.	South African Airways	Air			16		No response
4.	Aerospace Chamber	Air	TETA		8		No response
5.	Railroad Association of SA (RRA)	Land			6	Yes (Sand L)	
6.	Construction/maintenance: Railroad Association of SA (RRA)	Land			7		No response
7.	South African National Roads Agency Ltd. (SANRAL)	Land	Toll roads		12	Yes (L)	
8.	SA Petroleum Industry Association (SAPIA)	Land	Fuel		2		Declined to participate
9.	Motor Industry: Maintenance/repairs Ombudsman	Land			10	Yes (S)	
10.	Arrive Alive	Land	Traffic	Adv. Johan Jonck referred to DoT Spokesperson Mr. Ntau Letebele	6		No response
11.	The South African Metered Taxi Association (SAMTA)	Land	Taxi industry		5		No response
12.	The Road Freight Association (RFA)	Land		Forwarded questionnaire to members	4		No response
13.	Road Freight Chamber	Land	TETA	Referred to Willem	7		No response

N o.	Organization	Sub-sector	Additional description	Referral	Number of times contacted	Q completed Yes	Q completed No
				Schutte			
14.	Road Passenger Chamber	Land	TETA	Referred to Willem Schutte	10		No response
15.	Taxi Chamber	Land	TETA	Referred to Willem Schutte	10		No response
16.	Imperial Car Rental, division of Imperial Group (Pty) Ltd	Land			8	Yes (S)	
17.	Unitrans Holdings (Pty) Ltd.	Land	Charter		9	Yes (L)	
18.	Spoornet	Rail			7		No response
19.	Rail Chamber	Rail	TETA	Referred to Willem Schutte	7		No response
20.	South African Rail Commuter Corporation Ltd (agency of National DoT) – Metrorail	Rail			14		Declined to participate
21.	Robhitch (for Transwerk)	Rail	Maintenance on rail infrastructure		6	Yes (S)	
22.	Mearsk SA (Pty) Ltd.	Aquatic	Shipping Lines		7		No response
23.	National Ports Authority of South Africa	Aquatic			8	Yes (S)	
24.	South African Oil and Gas Alliance (SAOGA)	Aquatic	Ship Repair and Offshore Services		5		No response
25.	South African Association of Freight Forwarders (SAAFF)	Aquatic	Freight forwarders		6		Declined to participate
26.	Maritime Chamber	Aquatic	TETA	Referred to Willem Schutte	7		No response
27.	South African Port Operations (SAPO)	Aquatic			6		No response
28.	Rennies Travel (Bidtravel)	Land	Travel Agents				Declined to participate
29.	Petronet	Pipelines			6		No response
30.	Bolt Grindrod (Pty)	Storage			8		No

No.	Organization	Sub-sector	Additional description	Referral	Number of times contacted	Q completed Yes	Q completed No
	Ltd.						response
31.	Fedex (Supaswift)	Communications			11		No response
32.	The South African Post office (SAPO) XPS Speed Services Couriers DOCEX Postbank Direct Mail Centre Sales	Communications	Post and Telecommunications		11		No response
33.	Telkom	Communications			4		No response
34.	Dept. of Transport (name to be forwarded)	Inter-modal / multi-modal					No response
35.	Safcor Panalpina	Inter-modal / multi-modal	Logistics		4	Yes (S)	
36.	Bidvest / Bidterm (Bidfreight)	Inter-modal / multi-modal	Logistics		4	Yes (S)	
37.	Mcdonalds Transport	Inter-modal / multi-modal	Haulers		6	Yes (S)	
38.	Cargo Carriers	Inter-modal / multi-modal	Haulers		4		Declined participation
39.	Freight Dynamics	Inter-modal / multi-modal			11		No response
40.	La Farge	Inter-modal / multi-modal	Multinationals		4		No response
41.	Premier Foods	Inter-modal / multi-modal	Multinationals		11		Logistics outsourced
42.	Pioneer Foods	Inter-modal / multi-modal	Multinationals		5		Logistics outsourced
43.	Tiger Brands Limited	Inter-modal / multi-modal	Multinationals		7	Yes (S)	
44.	Safmarine	Inter-modal / multi-modal	Logistics		9	Yes (S)	
45.	City of Cape Town : Department of Transport				11		No response
46.	Solidariteit				8		No response
47.	Focus		Transport & log. magazine		4		No response

Summary:

Questionnaires sent	47	sample
Long questionnaire received back	4	29%
Short questionnaire received back	10	71%
Total responses	14	30% of sample

Sub-sector	Sample	% of total	Q received back
Air	4	9%	3
Land	14	30%	4
Rail	4	9%	1
Aquatic	6	13%	1
Pipelines	1	2%	
Storage	1	2%	
Communications	3	6%	
Inter/Multi modal	11	23%	5
Other	3	6%	
Total	47	100%	14