TETA SECTOR PROFILE

Integrated Report

2018

Transport Education Training Authority

Heart of Skills Innovation

Prepared for:

Transport Education Training Authority

Heart of Skills Innovation

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EXECUTIVE SUMMARY

Urban-Econ Development Economists (Pty) Ltd was appointed by the Transport Education and Training Authority (TETA) to conduct research on the Transport Sector's Skills Profile. The aim of this report is to contextualise the transport sector to provide a backdrop for skills development within the sector. This was done through:

- Undertaking an ***extensive literature review*** which entailed research on global and national transport trends and the influence of PESTLE, previous TETA research and resources
- Sourcing ***secondary data and statistics*** and disaggregating statistical data for sub-sectors where possible
- ***Primary data collection*** through hosting three workshops (Western Cape, KwaZulu-Natal and Gauteng) with industry stakeholders, undertaking face-to-face interviews with the eight TETA Chamber Executive Officers and 13 industry entity representatives and distributing electronic surveys to 939 levy paying entities
- ***Forecasting of the labour demand*** for the transport sector through utilising ***"U-E Economic and Labour Forecasting Model"*** which was customised to the transport sector to give a future projection of labour and skills demands for the sector for five years.

Key academic orientated views through the extensive literature review were revealed through the ***Theoretical Framework***. Main views expressed include the significant impacts that transportation has had on the spatial form and economic functioning around the world, of which the most significant advancement was the automobile which led to unprecedented sprawl, and subsequently the freeway system.

In addition to the above, South Africa's urban form was influenced by the apartheid system which was tailored to control urbanisation and to restrict the traffic of black populations into industrial areas to the labour needs of the region. Land use and subsequently transit systems were designed to keep black populations on the outskirts of economic activity. This aspect fundamentally defines the country's transportation system as it stands today. the Taxi industry was born from apartheid policy's failure to invest into adequate public transport for all populous segments of the country.

Transportation is critical to all aspects of the economy. Transportation supports clusters of agglomerations, increases productivity, enhances jobs and labour market accessibility, opens new markets for businesses and enhances supply chain efficiency. In South Africa, the economy consists of both the formal economy (first economy) and the informal economy (second economy). This is no different for the transport sector. The informal economy is dominated by land-based passenger transport as mini-bus taxi services. Apart from taxi owners and drivers, jobs in this segment include queue marshals, guards, self-employed drivers, and mechanics who are often employed outside of labour regulations. Operations and employment in the informal economy of the transport sector remains largely unregulated and decentralised. It also continues to be an inexpensive alternative to formal passenger transportation to the urban working poor.

The theoretical framework furthermore touched on the impact of the transportation system on the environment, albeit unintentional. The relationship between transportation and the environment is paradox in nature since transportation conveys substantial socio-economic benefits, but at the same time is impacting environmental systems. It is estimated that transportation energy consumption will increase at an annual average rate of 1, 4%, with most of the growth in energy consumption likely to occur in regions outside of the Organisation for Economic Cooperation and Development (non-OECD).
The transport sector is impacted by changes in the external environment. These factors have been identified as:

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- Political and legal factors
- Economic factors
- Urbanisation
- Growth in motorisation
- Technological and environmental factors

The ***International perspective*** provides an overview of current trends and advancements in the transport sector worldwide. These include and are largely centred around new technologies relating to, ICT, navigation and automation (specifically advances related to the 4IR). These developments lead to changes in skills requirements to ensure, amongst other things, a safe interaction between humans and their assisting technology. The implications of new technologies and models of transportation service delivery are broad and are likely to transform the way people and goods move over the coming decades.

Challenges universal to the global transport sector include congestion and infrastructure. Congestion is likely to remain an ongoing issue due to the amounting demand for transportation that are generated by the global economy. Congestion occurs when the demand for mobility, exceeds it capacity, and is true for all modes of transport. Infrastructure shortages stem directly from the demand for mobility. Transport infrastructure investment is projected to increase at an average annual rate of about 5% worldwide between 2014 and 2025. Questions around the financing of transport infrastructure have become burning issue around the world, as the costs of keeping pace with the growth in demand are making it difficult for even the developed countries to provide public funding on the scale required to meet expectations.

The future outlook for the transport sector in developing countries such as South Africa, is not very optimistic. This is because developing countries are underprepared for 4IR in transportation since their weaknesses include rising costs of production, relatively low productivity levels, lack of highly skilled labour and uncertainty about government policy. However, the transport sector in South Africa are adopting green technologies in an effort to combat the effects of the transport sector on global warming. These include gearing the sector with new green skills.

The document gives an overview of ***the South African Transport Sector*** through looking at its economic contribution on the basis of GVA- and employment share. The transport sector in South Africa are reported on the basis of the following modes:

- **Land** (rail passenger, rail freight, road passenger and taxi)
- **Air** (passenger and freight)
- **Water** (passenger and freight)
- **Inter or Multi-modal** (forwarding & clearing and freight handling)

The GVA and employment contribution for the transport sector are set out below:

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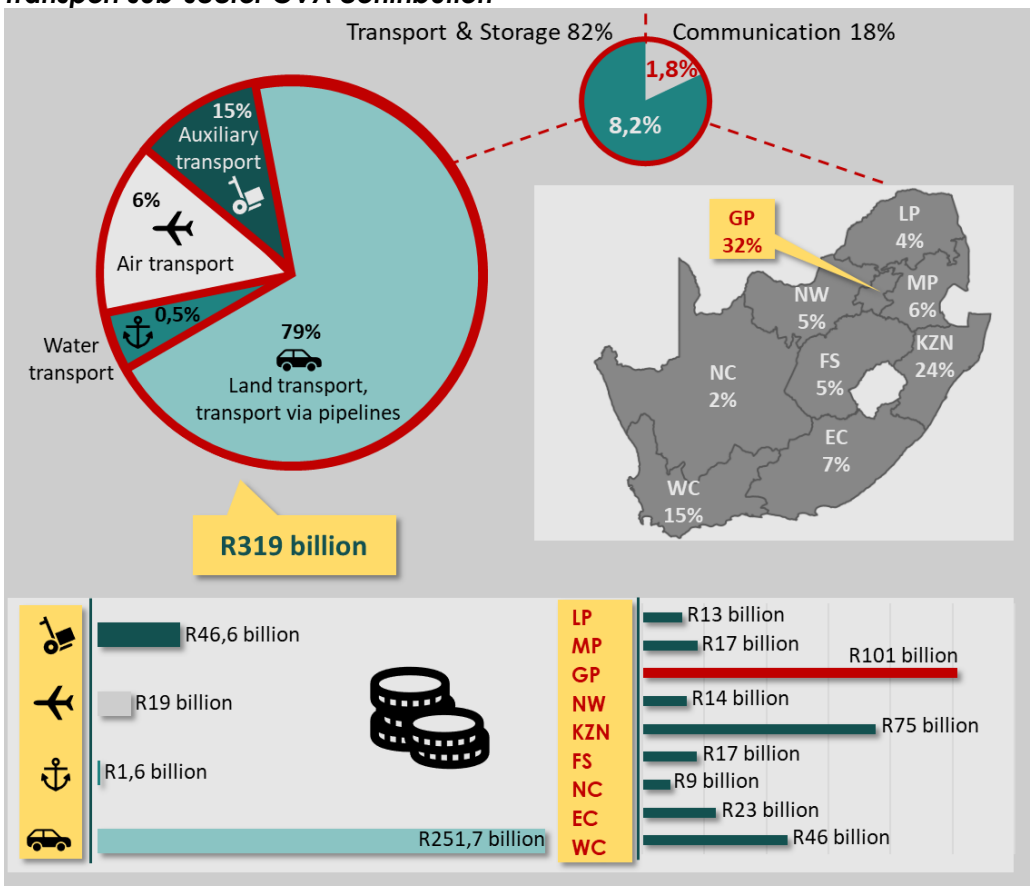
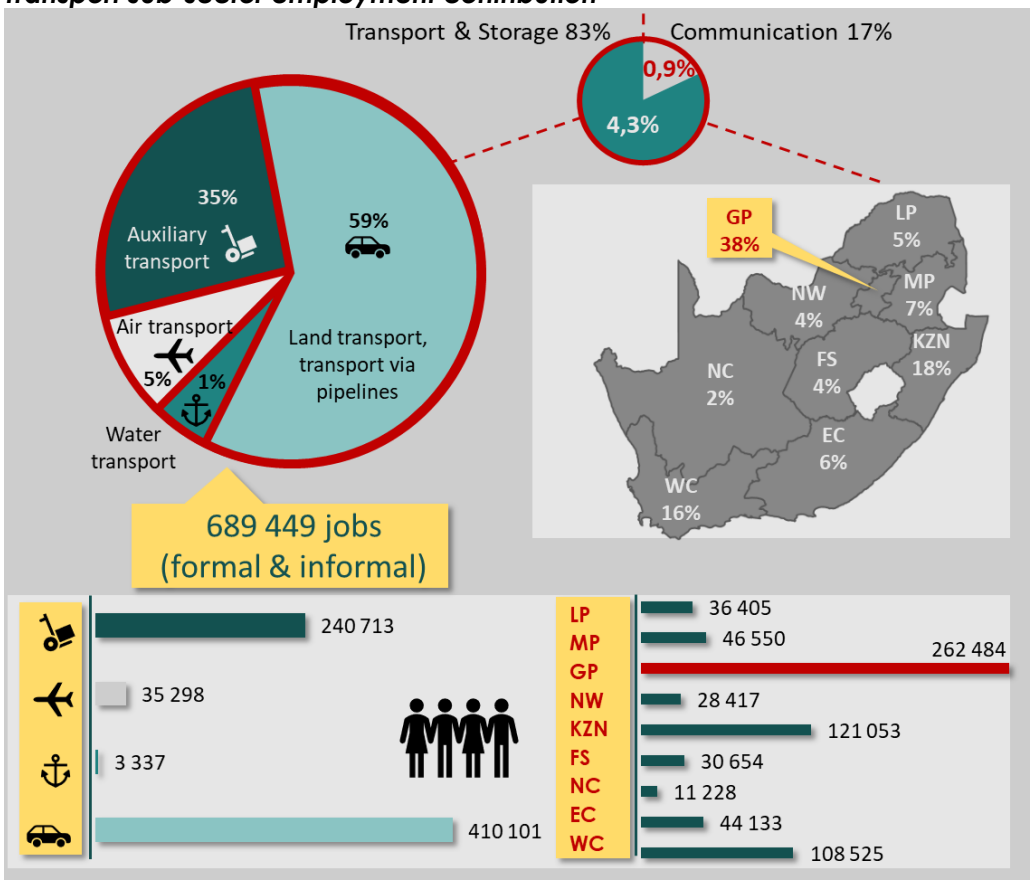
Transport sub-sector GVA contribution



Transport sub-sector employment contribution



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The primary research conducted furthermore provided a profile of transport businesses. These results revealed the following for responding businesses:

- Approximately 35% of businesses are small (less than 50 employees), 32% are medium (more than 50 employees, but less than 150), and 33% large (more than 150 businesses)
- The majority of r businesses are classified as road freight (41%)
- 51% have their head offices in Gauteng
- 76% of workers are employed by large businesses
- 71% of employees are based in Gauteng
- On average transport business employs 168 employees
- The sector is dominated by occupations classified as 'plant and machine operators and assemblers' (20%) and 'elementary occupations' (19%)

The Transport Sector Labour and Skills Profile provides an overview of the required labour per occupation, as forecasted by the ***"U-E Economic and Labour Forecasting Model"***. The table below reveals the total anticipated jobs for each Chamber, as well as the net jobs (additional new jobs) that are anticipated between 2019-2023. The model provides three possible scenarios, i.e. low scenario (conservative growth), median scenario (most-likely growth) and high scenario (extreme growth).

Projected Net and Total labour demand per Chamber

Chamber	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
		Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Aerospace	5%	49 838	50 890	51 942	7 496	7 807	8 118
Forwarding & Clearing	5%	42 285	43 177	44 070	6 360	6 624	6 888
Freight Handling	18%	170 543	174 143	177 743	25 652	26 716	27 780
Maritime	0,5%	4 652	4 750	4 848	700	729	758
Rail	11%	106 056	108 295	110 533	15 952	16 614	17 276
Road Freight	9%	86 159	87 977	89 796	12 959	13 497	14 035
Road Passenger	5%	47 349	48 349	49 348	7 122	7 417	7 713
Taxi	46%	426 142	435 138	444 134	64 097	66 756	69 415
Total	**100%**	**933 022**	**952 719**	**972 415**	**140 339**	**146 161**	**151 982**

Forecasted annual growth rate

Annual growth rate	
2019	3,6%
2020	3,5%
2021	3,4%
2022	3,3%
2023	3,2%
Average	**3,4%**

The results from the labour demand model can be presented to provide a forecast of the annual growth rate for employment within the Transport Sector. These results are presented in the table to the left.

The forecasted employment growth gives a good indication of the forecasted economic growth – as economic performance and employment are closely related, and in fact, economic performance is factored in employment and occupation forecasts, as presented through this model.

The results can also be displayed to give the percentage distribution of the anticipated share per OFO group. These are set out in the table below, which reveals that overall, the greatest concentration of anticipated jobs fall within the Plant and Machine Operators and Assemblers Group.

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Total labour demand distribution by occupation (2019-2023)

OFO Group	Aerospace	Forwarding & Clearing	Freight Handling	Maritime	Rail	Road Freight	Road Passenger	Taxi	Overall
Managers	4%	19%	8%	8%	5%	6%	3%	4%	**6%**
Professionals	2%	5%	4%	6%	5%	4%	2%	10%	**7%**
Technicians and Associate Professionals	16%	26%	11%	24%	8%	6%	3%	0%	**9%**
Clerical Support Workers	14%	30%	9%	6%	4%	14%	11%	10%	**10%**
Service and Sales Workers	28%	1%	3%	5%	4%	2%	10%	14%	**9%**
Skilled Agricultural, Forestry, Fishery, Craft and Related Trades Workers	10%	0%	12%	9%	12%	1%	6%	0%	**5%**
Plant and Machine Operators and Assemblers	5%	13%	36%	19%	52%	58%	62%	55%	**43%**
Elementary Occupations	21%	5%	16%	22%	9%	9%	4%	5%	**11%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

The following table provides the net demand (additional jobs) figures for the ***top 25 prioritised occupations across all Chambers.*** The table furthermore provides the percentage share of all prioritised occupations and the percentage share of all occupations (both prioritised and non-prioritised occupations).

Top 25 prioritised occupations

Top 25 prioritised occupations	Share of all prioritised occupations	Share of all occupations	Net (additional jobs)
1. Chauffeur	29%	12%	17 569
2. Taxi Driver	29%	12%	17 385
3. Truck Driver (General)	11%	5%	6 541
4. Train Driver	3%	1%	2 059
5. Flight Attendant	3%	1%	1 861
6. Railway Signal Operator	3%	1%	1 744
7. Bus Driver	3%	1%	1 572
8. Airline Ground Crew	2%	1%	1 179
9. Freight Handler (Rail or Road)	1%	1%	823
10. Aeroplane Pilot	1%	0,5%	760
11. Forklift Driver	1%	0,5%	723
12. Travel Consultant	1%	0,4%	600
13. General Clerk	1%	0,4%	582
14. Store Person	1%	0,4%	524
15. Electrician	1%	0,3%	500
16. Clearing and Forwarding Agent	1%	0,3%	456
17. Supply and Distribution Manager	1%	0,3%	376
18. Mechanical Fitter	1%	0,2%	364
19. Train Controller	1%	0,2%	346
20. Dispatching and Receiving Clerk / Officer	1%	0,2%	314
21. Aircraft Maintenance Mechanic	0,5%	0,2%	299
22. Diesel Mechanic	0,5%	0,2%	285
23. Welder	0,5%	0,2%	284
24. Electrical Engineering Technician	0,4%	0,2%	222
25. Warehouse Manager	0,3%	0,1%	209
Total (all prioritised occupations)			**60 535**

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The prioritised occupation with the highest net demand is Chauffeur, with approximately 17 569 anticipated additional jobs, followed by Taxi driver at 17 385. The top two prioritised occupations make up 29% of prioritised occupations and 12% of all occupations respectively.

It is important to note that these results are based on WSP/ATR submission data. The two occupations with the highest anticipated additional jobs (Chauffeur and Taxi Driver), come from the Taxi Chamber. The poor submission rate for the Taxi Chamber could present a skewed picture of the occupation and skills need. ***It is thus important for each Chamber to critically interrogate and moderate the forecasted results.*** The forecasted results are meant to guide the Chambers and to provide an indication of whether the priority focus areas are representative of the occupational demand, as expressed through the ATR results.

The top ***25 non-prioritised occupations*** are contained in the table below:

Top 25 non-prioritised occupations

Top 25 non-prioritised occupations	Share of all non-prioritised occupations	Share of all occupations	Net (additional jobs)
1. Call Centre Salesperson	5%	3%	4 591
2. Engineering Production Systems Worker	4%	3%	3 769
3. Occupational Instructor / Trainer	4%	3%	3 673
4. Train Driver	3%	2%	3 098
5. Adult Education Teacher	3%	2%	2 755
6. Service Station Attendant	3%	2%	2 755
7. Railway Signal Operator	3%	2%	2 693
8. Dispatching and Receiving Clerk / Officer	3%	2%	2 510
9. Vehicle Detailer (Valet Servicer)	2%	1%	1 959
10. Truck Driver (General)	2%	1%	1 928
11. Delivery Driver	2%	1%	1 471
12. Railway Track Worker	2%	1%	1 374
13. Passenger Coach Driver	2%	1%	1 355
14. Travel Consultant	2%	1%	1 286
15. Corporate Services Manager	1%	1%	979
16. Office Cashier	1%	1%	979
17. Railway Track Worker	1%	1%	931
18. General Clerk	1%	1%	829
19. Tanker Driver	0,9%	1%	809
20. Import-export Administrator	0,9%	1%	805
21. Electrician	0,8%	0,5%	713
22. Delivery Driver	0,8%	0,4%	644
23. General Clerk	0,7%	0,4%	605
24. Operations Manager (Non-Manufacturing)	0,7%	0,4%	571
25. Train Controller	0,6%	0,4%	539
Total (all non-prioritised occupations)			**85 626**

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that the top 10 non-prioritised occupations have higher net demand than the fourth to ninth prioritised occupations. This, along with the fact that fact that the Prioritised Occupations Share for half of the Chambers are below 50% indicates that the priority occupations focussed on by each of those Chambers may be too narrow. This implies that key or significant occupations may not be prioritised or receiving the necessary attention.

Based on the knowledge gained, ***key research findings and implications*** for future TETA planning and future engagements with the Transport sector were identified.

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The following key findings and its implications for the Transport sector have been identified:

Emerging Trends

The transport sector, being central to the functioning of most other sectors and industries, is particularly susceptible to and influenced by ***technological trends***.

Technology in the supply chain space is particularly concerned with streamlining processes and eliminating ineffective and time-consuming methods of transportation and freight handling.

The fourth industrial revolution (4IR) is likely to have the greatest influence on the transport sector. The 4IR is seeing the deployment of cyber-physical systems; merging physical, digital and biological processes to produce artificial intelligence; automated processes and real-time communication, reactions and ledgers (blockchain).

The emergence of the green economy and related green technology will also have a major influence on the transport sector. The introduction of alternative fuel, hybrid vehicles and electrical cars will not only influence the potential impact of the transport sector on the environment but will see a change in transport infrastructure and environment.

Implications for the Transport Sector and TETA:

Emerging technological trends should be central to all thinking and planning for TETA. These and other trends will see the need for re-alignment and upskilling of existing skills, as well as the emergence of new skills.

WSP/ATR Participation Rate

WSP/ATR participation and submissions have been described as a ***cumbersome and complicated*** process. As a result, many companies (and in particular those companies that employ less than 50 people) do not participate.

Reportedly, the complicated and time-consuming process often leads to mistakes and information being captured incorrectly.

Implications for the Transport Sector and TETA:

The fact that many companies do not participate in the WSP/ATR process means that TETA does not have accurate information pertaining to employee numbers, training requirements and pertinent skills for each of the Chambers. This means that any planning done in terms of skills development does not take the needs of the entire transport industry into consideration, leading to a mismatch of programmes and industry needs. (This is particularly true if one considers that the sector is largely a small enterprise sector).

SIC Demarcation Discrepancies

At present, the various ***activities*** included in TETA's jurisdiction are ***not aligned with the SIC 5th edition logic***.

The 'waste management' and 'ocean and coastal fishing' activities in particular are problematic. No disaggregated data is available for these activities, as they are reported

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on as part of the 'Agriculture, Hunting, Forestry and Fishing' and 'Other Community, Social and Personal Service Activities'.

Moreover, the official available statistical data breakdown according to the SIC codes are not disaggregated according to the different Chamber activities. For example, SIC code groups all land transport and transport via pipelines together, as well as all auxiliary transport together. This is further complicated by the fact that data from official sources are collated and reflected at a higher level (three digits) than what is used by TETA (five digits).

It was discovered that the Maritime Chamber is a very small Chamber, both in terms of skills levy contribution, as well as employment contribution. It was suggested that this Chamber would benefit from being incorporated into another Chamber.

The Forwarding and Clearing Chamber has also evolved from just forwarding and clearing of freight, to the wider supply chain. Considering this, it has been suggested that the Chamber be renamed to follow international and industry trends.

Implications for the Transport Sector and TETA:

Misalignment of activities and the inability to disaggregate the collated statistical data means that the official statistics could either represent broader or narrower sectors than those specifically falling under TETA's mandate.

Furthermore, reporting in line with TETA's Chambers cannot be done accurately. To obtain detailed Chamber profiles, TETA would be required to make informed estimates and inferences.

During the research process, it was identified that the current method of ***distribution of funding within TETA is not done according to levy paying contribution, nor to the size of the Chamber industry.***

It should be acknowledged that TETA faces challenges with regards to aspects of the industry it serves. The Taxi industry, although organised in some respects, is considered to be predominantly informal in nature. As a result, very few entities within this Chamber pay skills levies or submit WSP/ATR data – yet the taxi industry holds a significant proportion of employment contribution within the transport sector.

Implications for the Transport Sector and TETA:

TETA faces a very unique situation with regards to the distribution of funding. While Chambers with high rates of levy paying entities and WSP/ATR submission should be rewarded through reaping the skills benefits associated with TETA funding, Chambers with the greatest need for intervention and skills development cannot be overseen due to non-contribution of its entities.

The nature of ***skills and occupation training is perceived*** by stakeholders ***to be about achieving targets*** (the number of people trained) ***instead of ensuring a career path*** for those within the industry.

A pertinent example of this is the fact that every year a predetermined number of individuals are trained to obtain their Commercial Pilot's Licence (CPL).

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However, after obtaining a CPL, an individual cannot be employed as a pilot for any commercial airline, as a considerable amount of additional flying hours is required to no longer be an insurance liability, and to eventually obtain an Air Transport Pilot's Licence (ATPL).

Implications for the Transport Sector and TETA:

Many individuals within the Transport Industry face the challenge of obtaining initial qualifications and competencies but are unable to bridge the gap to actually be employable within the sector.

The implications for TETA and the transport sector are that many of these individuals that are unable to advance their careers eventually leave the transport industry. This means that funding spent on specific training programmes have been fruitless. Furthermore, the fact that career paths are not being prioritised may see a shortage of specialised skills in the industry in the future.

A great challenge facing the transport industry relates to an aging workforce and the associated ***institutional knowledge that is being lost once these individuals retire***.

At present, there is no formalised 'knowledge and skills maintenance' programme in place to ensure that the expertise and knowledge is not lost but is carried over to the next generation.

Implications for the Transport Sector and TETA:

The loss of institutional knowledge and skills is often referred to as the 'knowledge drain'. The inability to retain or transfer knowledge and expertise could result in dire consequences for the transport industry.

The failure to retain and/or transfer knowledge and skills may see transport companies experiencing high employee turnover. This could result in higher costs for individual companies (associated recruitment and training costs) and an overall decrease in efficiency for the entire transport industry.

A number of stakeholders believe that many of the QCTO accredited ***qualifications are too broad, and not specific enough to address job requirements***. It was furthermore highlighted that not enough relevant part qualifications or areas of specialisation exist to address the needs of the transport industry.

It is understood that prior to the introduction of a new QCTO accredited qualification, comprehensive consultations with the relevant SETA(s) and other industry stakeholders are undertaken. However, it has been highlighted that in many instances, SETAs do not have a clear understanding of industry needs, due to non-submission of WSP/ATRs. In this regard, many industry role-players will only realise that a qualification is not talking to their skills needs only after it has been implemented.

Implications for the Transport Sector and TETA:

Qualifications that are too broad, or do not talk to the needs of the industry, could lead to a case of skills mismatch or skills gaps in the industry.

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Skills mismatch and skills gaps have implications not only for individual businesses, but for the industry as a whole. It could lead to lower job satisfaction for workers, loss of productivity and higher employee turnover. This all has the potential to lead to a decrease in GDP contribution of the transport sector.

Should qualifications continue to not speak to job requirements, the extreme case would be that employers seek to implement new technologies and automated solutions to replace certain skills. This could mean that the industry shows a low demand for specifically skilled labour.

Informal Skills Development

A significant component of the transport sector falls within the informal economy. Most of the informality is due to the minibus taxi industry.

There is a great need for training within the informal transport sector. At present, skills requirements from the informal economy side are underrepresented due to the lack of WSP/ATR submissions. This, however, does not mean that these skills and the informal industries should be overlooked – on the contrary, businesses and individuals within this space should be supported to ensure they can graduate to the formal economy and be able to establish themselves with the required skills.

Implications for the Transport Sector and TETA:

Assisting individuals and businesses active within the informal economy with skills development could lead to a scenario where individuals and businesses are able to graduate to the formal economy. This could lead to an overall increase in GDP for the transport sector as well as greater participation in WSP/ATRs and contribution towards the skills levy.

Forecasted Skills Interrogation

The skills demand forecasting model provides a forecast for all occupations within the eight Chambers, both prioritised and non-prioritised occupations. These results are contained in Section 7.

The results gained from the model are based on WSP/ATR submission data. WSP/ATR submission rates irrefutably influence the results. As such, each Chamber should critically interrogate and moderate the forecasted results. This is especially true for the taxi Chamber.

Implications for the Transport Sector and TETA:

The advantage of the demand forecasting model is that it provides a sound basis for TETA to do its planning. The model furthermore gives a prioritised occupation share, which gives an indication whether each Chamber's focus is too narrow and whether it should shift its focus to ensure key significant occupations receive the necessary attention.

The following ***Recommendations*** have been put forward:

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Skills & technology alignment

TETA should ensure that all skills development programmes are in line with technological advancements. This will require constant research and engagement with industry stakeholders and training institutions such as TVET colleges, Universities, Universities of Technology, and specialised schools.

A great aspect of alignment will consist of constant up-skilling or top-up of existing skills to ensure employees stay relevant.

NSDP 2020 systems preparation

The New National Skills Development Plan (NSDP) will come into effect in 2020. With the new NSDP, WSP/ATR requirements and submissions will also need to be updated.

TETA need to ensure that 2019 is dedicated to ensuring its systems, institutional knowledge and resources are in place to effectively implement NSDP 2020.

Simplify WSP/ATR submission

As far as possible and permissible, WSP/ATR submissions should be simplified and standardised. This should especially be the case for small companies (50 employees or less).

A simplified WSP/ATR submission format and less tedious process would see WSP/ATR submissions increase, and the quality of submissions improve.

Engage with peer SETAs

TETA needs to engage with other SETAs on the SIC mismatch issue and consider a submission to the Minister to review the SIC demarcations and its implications.

This may require attending workshops to compare the different SIC code allocations between the SETAs and come up with logical redistribution suggestions.

Refinement of TETA Chambers

TETA should undertake a process of relooking at its Chamber composition:

TETA should look at broadening the Maritime definition, to incorporate the Sector Skills Model (as developed by SAMSA) into the Maritime Chamber

The Forwarding and Clearing Chamber has evolved significantly in recent times. The scope of this Chamber is no longer contained to Forwarding and Clearing activities but include extended supply chain activities. This may warrant TETA to relook at its Chambers, and how it should realign to fit into the broader supply chain. If following SAMSA's logic, this could see Maritime, Forwarding & Clearing and Freight Handling merging.

Communication and engagement with industry

Stakeholders have identified a great need for TETA to engage with them on a more regular basis. To this end, it is important for TETA to relook at their current engagement practices and come up with a new engagement strategy.

In particular, TETA should ensure that it is engaging with the correct stakeholders to provide the relevant information regarding skills requirements and trends in the industry.

Engagements should also not be limited to Chamber Committees. Regular, focussed workshops should also be considered.

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Adjust the distribution of funds

The current method of funding distribution as deployed by TETA should be reviewed. TETA should investigate alternative ways of allocation of funds.

This may require TETA to come up with a formula to calculate the funding each Chamber received, taking the Chamber skills levy contribution, as well as the size of the Chamber into consideration.

Communication and engagement with training institutions

In order to ensure that transport related training programmes remain relevant, TETA should forge partnerships with relevant institutions offering transport specific programmes of relevance to the industry. This will assist in addressing the skills mismatches identified.

TETA could furthermore identify opportunities for institutions to offer specific transport programmes.

Training institutions include TVET Colleges, private colleges, Universities, Universities of Technology, and specialised schools.

Consider funding skills transfer programmes

In order to avoid the 'knowledge drain', TETA should consider funding skills transfer and mentorship programmes.

These programmes should entail the enlisting the assistance of employees and experts in the transport industry nearing retirement. A formal programme could be put in place to ensure that the institutional knowledge is retained and transferred to younger generations within the transport industry.

Mentorship programmes should involve retired individuals and experts. This will not only benefit the industry and younger generations but provide a transitioning period for retirees.

Consider longer-term projects

In 2019, most legacy qualifications will be phased out and only QCTO qualifications will be registered on the NQF.

The new qualifications require work-based learning. TETA should ensure that it can provide the relevant (budget) support in ensuring that individuals receive the relevant exposure (e.g. assisting individuals to go from CPL to ATPL etc.).

It is further recommended that TETA work with QCTO to ensure that the qualifications are specialised and tailored to the industry. TETA should also influence the formulation of part-qualifications to ensure greater specialisation.

This longer-term view is facilitated by the re-establishment of SETAs from 2020 as permanent structures – the 5-year re-establishment requirement will fall away creating the opportunity for SETAs to engage in long-term skills development interventions

Expand the scope of priority occupations

Results gained from the skills demand forecasting model indicate that most of the Chambers have a very narrow occupation focus.

The results are indicative of which occupations are considered important by the industry (based on WSP/ATR submissions).

TETA should interrogate the forecasted results and reprioritise occupations to ensure that key significant occupations receive the necessary attention.

It is further advised that TETA workshop the results with industry stakeholders to gain further insights into prioritising of occupations.

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Training for informal occupations

It is recommended that TETA focus on the training of those considered to be employed in the informal economy. This relates largely to the Taxi Chamber.

Informal occupation training should be focussed on providing skills and qualifications to enable the individuals to become part of the formal economy, as well as to graduate these businesses they are engaged in, into formal businesses.

Although this research project has been quite comprehensive, some gaps regarding future trends, and future skills and occupations that follow from the findings, exist. Two topics have been identified, which would benefit from future research – not only for TETA, but for the transport industry as a whole:

Investigate the impact of green technology on the existing infrastructure and workforce

Emerging trends indicate that the transport industry will become less reliant on fossil fuels and more reliant on green technology and electromobility.

At present, the skills, occupations and infrastructure supporting the transport industry are still based on fossil-fuel technology (combustion engines, mechanical skills etc.). In order to prepare the industry and to remain relevant, research into the potential changes to the industry and subsequent skills need to be done.

Conduct research into the anticipated change in skills and occupations with the change in technology (Autonomy, AI, Internet of Things etc.)

The advancement of technology, and specifically in line with the fourth industrial revolution (4IR) will see the emergence of new cyber-physical systems and processes. This has the potential to have a significant impact on the transport sector.

Currently, the South African transport sector relies on labourers who manage or undertake most transport related functions and processes – however, with the emergence of autonomous technology and artificial intelligence, the role of the labourer may drastically change.

It is recommended that TETA undertake a study on future jobs in using future foresight methodology to assist TETA in moving its planning beyond the identification of current skills towards long-term and future skills demand.

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ACRONYMS

4IR	Fourth Industrial Revolution
AARTO	Administrative Adjudication of Road Traffic Offences
AASA	Airlines Association of South Africa
ABET	Adult Basic Education and Training
ACSA	Airports Companies South Africa
AI	Artificial Intelligence
ALPA-SA	Air Line Pilots' Association South Africa
AME	Africa and Middle East
APP	Annual Performance Plan
ASLC	Air Services Licensing Council
ATNS	Air Traffic and Navigation Services
ATPL	Air Transport Pilots' Licence
ATR	Annual Training Reports
AUSA	Aviation Union of South Africa
BAASA	Business Aviation Association for Southern Africa
B-BBEE	Broad-Based Black Economic Empowerment
BRT	Bus Rapid Transport
BUSA	Business Unity of SA
CAPPA	The Cape Port Producers' Association
C-BRTA	Cross-Border Road Transport Agency
CCA	Climate Change Authority
CHE	Council for Higher Education and Training
CILTSA	The Chartered Institute of Logistics and Transport SA
CIPC	Companies and Intellectual Property Commission
CIPS	Chartered Institute of Procurement & Supply
CNR	China North Rail
COBEO	Commuter Bus Employers Organisation
COSATU	The Congress of South African Trade Unions
CPL	Commercial Pilots' Licence
CRDP	Comprehensive Rural Development Programme
CPUT	Cape Town Peninsula University of Technology
CSCMP	Council of Supply Chain Management Professionals
CSR	China South Rail
CSSC	China State Shipbuilding Corporation
DETAWU	Democratised Transport Logistics and Allied Workers Union
DG	Discretionary Grant
DHET	Department of Higher Education and Training
DoL	Department of Labour
DORA	Division of Revenues Act
DoT	Department of Transport
DTI	Department of Trade and Industry
DUT	Durban University of Technology
EC	Eastern Cape
ECSA	Engineering Council of South Africa
EIA	Energy Information Administration
ETA	Estimated Time of Arrival
ETD	Education, Training and Development
ETQA	Education and Training Quality Assurance
EU	European Union
FAA	Federal Aviation Administration
FAWU	Food and Allied Workers Union
FDI	Foreign Direct Investment
FEDUSA	Federation of Unions of South Africa
FIATA	International Freight Forwarders Association
FoodBevSETA	Food and Beverage Manufacturing Industry SETA
FS	Free State
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GI	Great Intelligence
GP	Gauteng Province
GPS	Global Positioning System
GVA	Gross Value Added
HPCSA	Health Professions Council of South Africa
HR	Human Resources
HRDCSA	Human Resource Development Council South Africa
HSRC	Human Sciences Research Council
HTFV	Hard-to-fill Vacancies
H&WSETA	Health and Welfare SETA
IARIA	International Academy, Research and Industry Association
IATA	International Air Transport Association
ICAO	Federal Aviation Administration
ICASA	Independent Communications Authority of South Africa
ICCT	International Council on Clean Transportation
ICS	International Chamber of Shipping
ICT	Information and Communication Technology

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IDC	Industrial Development Corporation
IFSMA	International Federation of Shipmasters' Associations
IHHA	International Heavy Haul Association
IMarEST	Institute of Marine Engineering, Science and Technology
IMO	International Maritime Organization
IPAP	Industrial Policy Action Plan
IRSE	Institution of Railway Signal Engineers
IRU	International Road Transport Union
ISF	International Shipping Federation
ISIC	International Standard Industrial Classification of All Economic Activities
IT	Information Technology
ITB	Industry Training Board
ITF	International Transport Workers Federation
ITSSA	Intelligent Transport Systems South Africa
KZN	KwaZulu-Natal
LP	Limpopo Province
LPG	Liquified Petroleum Gas
MerSETA	Manufacturing, Engineering and Related Services SETA
MG	Mandatory Grant
MP	Mpumalanga Province
MIBCO	Motor Industry Bargaining Council
MLASA	Maritime Law Association
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRO	Maintenance, Repair and Overhaul
MTSF	Medium-Term Strategic Framework
MTWU	Motor Transport Workers Union
NAC	National Aerospace Centre
NACE	Nomenclature statistique des activités économiques dans la Communauté Européenne (Industry Standard Classification System used in the European Union)
NATMAP	National Transport Master Plan
NBCRFLI	National Bargaining Council for the Road Freight and Logistics Industry
NC	Northern Cape
NDP	National Development Plan
NEASA	National Employers Association of South Africa
NGP	National Growth Path
NIP	National Infrastructure Plan
NMU	Nelson Mandela Univeristy
NPO	Non-Profit Organisation
NQF	National Qualifications Framework
NSDP	National Skills Development Plan
NSDS III	National Skills Development Strategy III
NSRI	National Sea Rescue Institute
NTA	National Taxi Association
NTM	National Transport Movement
NUM	National Union of Mineworkers
NUMSA	National Union of Metal Workers of South Africa
NW	North West
OECD	Organisation for Economic Co-operation and Development
OFO	Organising Framework for Occupations
PESTLE	Political, Economic, Social, Technological, Legal and Environmental
PIVOTAL	Professional, Vocational, Technical and Academic Learning
PMAESA	Port Management Association of Eastern and Southern Africa
PRASA	Passenger Rail Agency of South Africa
PSET	Post-School Education and Training
PTAWU	Professional Transport & Allied Workers Union
PTP	Pivotal Training Plan
PTR	Pivotal Training Report
PwD	Persons with Disabilities
QCTO	Quality Council for Trades & Occupations
QLFS	Quarterly Labour Force Survey
RFA	Road Freight Association
RPL	Recognition of Prior Learning
RRA	Railroad Association of South Africa
RSR	Railway Safety Regulator
RTIA	Road Traffic Infringement Agency
SA	South Africa
SAA	South African Airways
SAAF	South African Air Force
SAAFF	The South African Association of Freight Forwarders
SAASOA	South African Association of Ship Operators and Agents
SAAT	South African Airways Technical
SABEA	South African Bus Employers Association
SABOA	South African Bus Operators Association
SACAA	South African Civil Aviation Authority
SACAU	Southern African Confederation of Agricultural Unions
SACCI	South African Chamber of Commerce and Industry
SACU	South African Customs Union

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SADC	Southern African Development Community
SAECA	South African Electronic Communications Association
SAEPA	South African Express Parcel Association
SAFFC	Skilled Agricultural, Forestry, Fishing, Craft or Related Workers
SAIMENA	South African Institute of Marine Engineers and Naval Architects
SAIMH	The South African Institute of Materials Handling
SAIMI	South African International Maritime Institute
SAMPA	South African Maritime Professionals Associations
SAMSA	South African Maritime Safety Authority
SAMTRA	South African Maritime Training Authority
SANRAL	South African National Roads Agency Limited
SANSBOC	South African National Small Bus Operators Council
SANTACO	South African National Taxi Council
SAPICS	The Association for Supply Chain & Operations Management Professionals
SARA	South African Railway Association
SARPBAC	South African Road Passenger Bargaining Council
SARS	South African Revenue Services
SASAWU	South African State and Allied Workers' Union
SATAWU	South African Transport and Allied Workers Union
SDL	Skills Development Levy
SDLC	Standard Development Life Cycle
SERI	System Engineering Research Institute
SETA	Sector Education and Training Authority
SIC	Standard Industrial Classification of All Economic Activities
SMDG	Shipplanning Message Development Group
SMME	Small, Medium and Micro Enterprises
SOC	State owned company
SOE	State-owned Entity
SOMMSA	Society of Master Mariners South Africa
SSP	Sector Skills Plan
StatsSA	Statistics South Africa
STCW	Standards of Training, Certification and Watchkeeping for Seafarers
STEM	Science, Technology, Engineering and Mathematics
TASA	Truckers Association of South Africa
TETA	Transport Education and Training Authority
TFR	Transnet Freight Rail
THETA	Tourism and Hospitality Sector Education and Training Authority
TIU	Tactical Intervention Unit
TLEA	Transport and Logistics Employers Association
TNPA	Transnet National Ports Authority
TPT	Transnet Port Terminals
TRP	Taxi Recapitalisation Policy
TVET	Technical and Vocational Education and Training
UAE	United Arab Emirates
UASA	United Association of South Africa
UE	Urban-Econ
UIC	International Union of Railways
UK	United Kingdom
UN	United Nations
UNTU	United National Transport Union
US	United States
USA	United States of America
USD	US Dollars
VUCA	Volatility, Uncertainty, Complexity and Ambiguity
W&RSETA	Wholesale and Retail SETA
WC	Western Cape
WSP	Workplace Skills Plans
YES	Youth Employment Service

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GLOSSARY

Critical Skills
Critical skills refer to a particular skill or skillset which an individual requires to carry out their duties.

Fourth Industrial Revolution (4IR)
The Fourth Industrial Revolution (4IR) is a new era that builds and extends the impact of digitisation in new and unanticipated ways, i.e. embracing mobile connectivity, artificial intelligence, Big Data, the Internet of Things (IoT), next-generation robotics, additive manufacturing (three-dimensional printing), blockchain software, wearable technologies and genetic engineering.

Hard-to-fill Vacancies (HTFV)
Hard-to-fill vacancies (HTFV) refer to those occupation vacancies that are difficult to fill due to subjective circumstances, and not necessarily due to a shortage of the particular skill in the labour market/industry.

Subjective circumstances in this case are notably related to one of two factors:

- ***Low response to a vacancy (quantity of applications)***
  This, in most cases, is directly related to the nature of the position/job, such as wages, employment conditions, location of the organisation. These factors may make the vacancy unattractive to the labour market and potential labourers.
- ***Experience related (quality of applications)***
  The experience of the applicants does not meet the standards or requirements longed by the particular organisation.

Informal Employment
"Informal employment identifies persons who are in precarious employment situations, irrespective of whether or not the entity for which they work is in the formal or informal sector. Persons in informal employment therefore comprise all persons in the informal sector, employees in the formal sector, and persons working in private households who are not entitled to basic benefits such as pension or medical aid contributions from their employer, and who do not have a written contract of employment" (Stats SA, 2018a).

Informal Sector
"The informal sector has the following two components:

i. Employees working in establishments that employ fewer than five employees, who do not deduct income tax from their salaries/wages; and
ii. Employers, own-account workers and persons helping unpaid in their household business who are not registered for either income tax or value-added tax" (Stats SA, 2018a).

Scarce Skills
These refer to those skills that are either not available/prevalent in South Africa, or those skills that only a select few people in South Africa have.

Sector Skills Plan (SSP)
The Sector Skills Plan (SSP) is a comprehensive, analytical document that details current labour market trends, supply and demand dynamics, growth prospects and performance of the Transport sector. The document is thoroughly researched to be a sound instrument that informs the strategic, policymaking and annual plans of TETA. Its principle aim is to guide training and skills development initiatives in the Transport sector and designated sub-sectors. The SSP consists of five main chapters, which tackles thematic priorities

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and issues, as well as making projections and recommendations toward skills development in the Sector (TETA SSP, 2016).

Standard Industrial Classification of all Economic Activities (SIC)

The Standard Industrial Classification of all Economic Activities (SIC) is the comprehensive classification structure of economic activities in South Africa. The SIC was designed for the classification of establishments according to kind of economic activity, and provides a standardised framework for the collection, tabulation, analysis and presentation of statistical data on establishments (Stats SA, 2012).

Each SETA has a mandate to serve the SIC Codes promulgated to it, as determined by The Minister of Higher Education and Training (as published in the Government Gazette, Government Notice No. R. 1055, 11 November 2010).

Workplace Skills Plan; Annual Training Report (WSP/ATR)

The WSP and ATR are accompanying reports that levy-paying organisations are required to submit annually in order to qualify for grants. The documents, respectively, provide a quantitative plan within the levy-paying organisation for the forthcoming year, and a report on performances from the previous year. More specifically, the WSP reports on the organisation's plans to address priority training and development needs, while the ATR reports on the number of education, training and development interventions conducted against the last WSP (TETA SSP, 2016).

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1. INTRODUCTION AND PURPOSE

1.1 INTRODUCTION TO STUDY

Urban-Econ Development Economists (Pty) Ltd was appointed by the Transport Education and Training Authority (TETA) to conduct research on the Transport Sector's Skills Profile. The aim of the study is to source sufficient, accurate, reliable and up-to-date empirical data that can be used to facilitate the planning of the transport sector skills development in South Africa.

1.2 SCOPE, FOCUS AND PURPOSE

The aim of this report is to contextualise the transport sector to provide a backdrop for skills development within the sector. This was done through undertaking an extensive literature review, a brief legislative and policy overview and an analysis of available macro-economic, statistical and employment data.

This report furthermore looks at the anticipated future developments for the transport sector. This was done by investigating the potential new skills requirements through looking at current realities within the sector such as the socio-political environment, advances in technology, pertinent challenges and new trends.

1.3 REPORT CONTENT

This report comprises seven sections. Figure 1-1 illustrates the remainder of the report, excluding this section (Introduction and purpose). Details regarding the content of the remaining sections are set out below:

- **Section 2: Research Approach**
  This section outlines the research methodology deployed in the execution of this study, and highlights the steps undertaken as part of this report. This section also looks at the limitations and challenges experienced in the compilation of this report, and which mitigating measures were deployed to minimise the negative effects in the outcome of this report.

- **Section 3: TETA Mandate and sector policy environment**
  The legal and policy environment within which TETA functions are discussed in this section, which clearly sets out TETA's mandate and functions. This is followed by a broad overview of the legislation governing the transport sector, sub-sectors and Chambers. This section also looks at the SIC codes that have been allocated to TETA and explores the challenges and limitations that are brought about as a result.

- **Section 4: Theoretical Framework**
  This section gives an academic orientated view of the transport sector and its historical and catalytic role in shaping the physical and economic environment. The section also looks at the different factors and events influencing the functioning of the sector.

- **Section 5: International perspective**
  This sector provides insights into the transport sector, from an international point of view. This includes some comparisons of the sector over various regions and allows for a reflection on current events impacting on the sector as well as advances and trends in the sector that may influence the transport sector in the future, and as a result, the skills that may be demanded.

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- **Section 6: The South African Transport Sector**
  This section focusses on the South African transport sector. This consists of a national overview and description of the different transport sub-sectors, followed by a macro-economic outline, focussing on the changes in GVA and employment over time. The primary data result obtained was used to provide an overarching profile of transport businesses to validate secondary data sources consulted.

  This section also looks at the sub-sectors that make up the transport sector. The economic significance and volumes transported for each of these sub-sectors are discussed, followed by a look at the typical profile of businesses within each Chamber, the prominent role-players and relevant challenges and trends experienced.

- **Section 7: The Transport Sector Labour and Skills Profile**
  This section is largely informed by the primary data inputs and the results gained from the skills demand forecasting model. The current skills profile for each Chamber is revealed, followed by the prominent skills trends observed within each Chamber. The various challenges experienced with regards to skills development and retainment are discussed. This section ends off by providing a comprehensive breakdown of the anticipated additional occupations for each Chamber, both for prioritised and non-prioritised occupations.

- **Section 8: Key Findings and Implications**
  Based on the knowledge gained from the preceding sections, this section puts forward key research findings and implications for future TETA planning and future engagements with the Transport sector.

- **Section 9: Recommendations**
  This section puts forward a number of key recommendations based on the key findings.

- **Section 10: Conclusion and Direction for Future Research**
  Recommendations for future research are put forward.

Figure 1-1: Report layout

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2. RESEARCH APPROACH

As stated earlier, the purpose of this study was to source reliable and up-to-date data pertaining to the transport sector, with the aim of profiling skills across the sector. The final report ultimately assists TETA in compiling Chapter 1 and other sections of the Sector Skills Plan (SSP) for the transport sector.

Profiling of skills within the transport sector cannot be done through only engaging with workplaces or referring to the Workplace Skills Plans (WSP) or Annual Training Reports (ATR), as this will only provide a limited perspective of the transport industry and the required skills within the sector. As a result, this study took a broader socio-economic view of the sector at large, and then pinned it down to skills and skills need.

The ultimate **objectives** of this study were thus to:

- Source up-to-date information to profile the Transport sector, which will enable TETA to more accurately describe its skills profile in the SSP (Chapter 1)
- Report on the findings and clearly describe short-and long-term implications for TETA, which will enable it to push its planning horizon to a multi-year one
- Recommend strategies to TETA to align its plans and discretionary resources with the needs of the Transport sector.

This study consisted of a mixed-method design, having drawn on both primary and secondary data of a qualitative and quantitative nature.

The following section sets out the methodology for this study, highlighting the relevant steps for this report.

2.1 RESEARCH METHODS/METHODOLOGY

The methodology deployed for this study is set out in Figure 2-1. The actions and deliverables for each of the steps are discussed below:

STEP 1: PROJECT INCEPTION

During this step the goals and objectives for the study, as well as the proposed execution plan, are discussed. An inception meeting was held on 14 May 2018 where the following actions were discussed:

- Confirmation of project scope & schedules
- Finalisation of research objectives and questions
- Identification of lists and contact details of relevant structures/bodies within the Transport industry
- Collation of required information (sector selection, relevant documentation, databases, etc.)
- Development of initial data collection tools for review
- Finalisation of project plan

After the inception meeting, a client workshop was held on 11 June 2018, with the aim of finalising the inception report as well as discussing the data collection tools.

The **deliverables** for this step included:

- Inception report
- Execution plan
- Draft data collection tools

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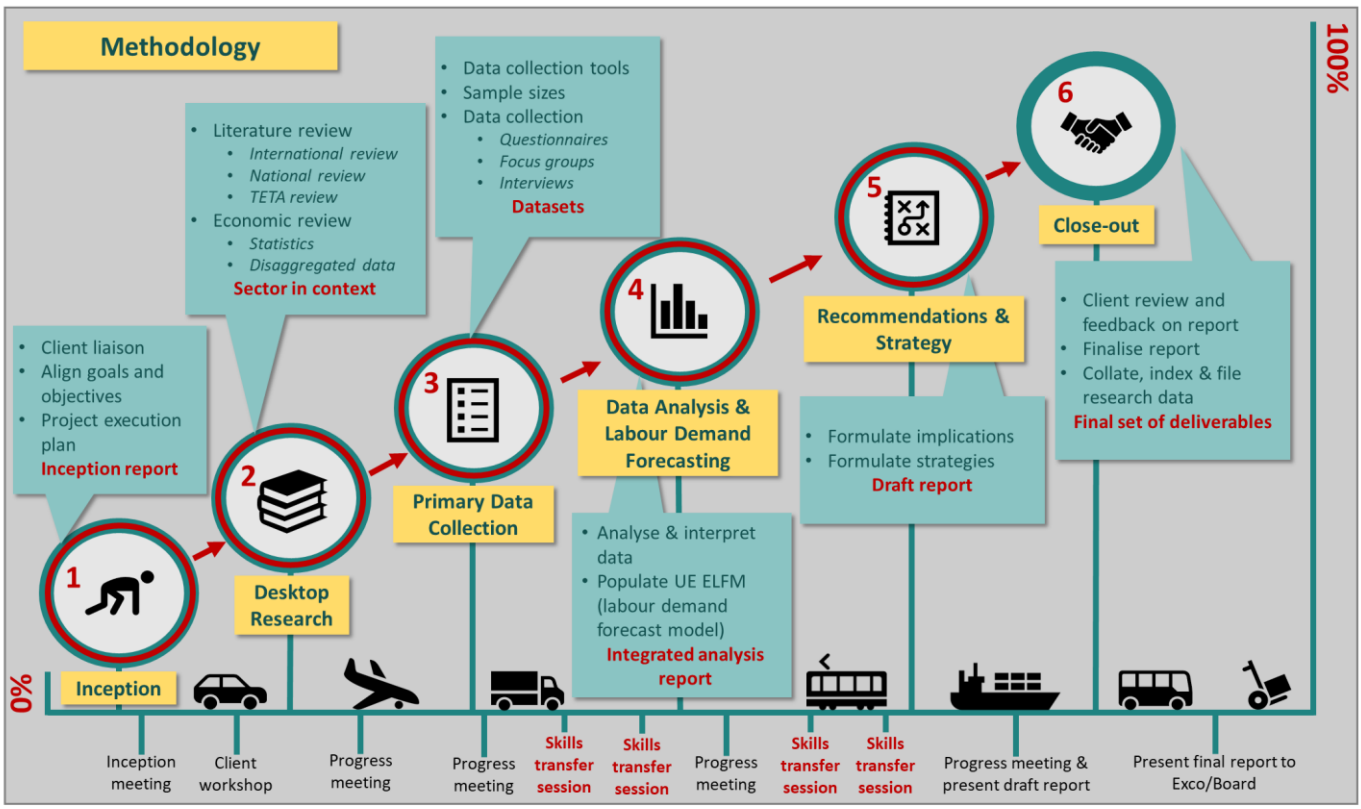

Figure 2-1: Project methodology

STEP 2: DESKTOP RESEARCH

The second step for this study comprises desktop research. The desktop research consists of two distinct actions with the aim of providing a reference framework and economic overview of the transport sector. This will set the context within which the transport industry is functioning to understand the skills demand and labour market.

The following actions were undertaken as part of this step:

- Literature review on global trends in the Transport sector and economic, social, technological, political and legal changes
- Literature review of national trends in the Transport sector and its labour market needs
- Literature review of relevant TETA research, SSPs, Strategic Plans and ATRs for the NSDS III period
- Source secondary data and statistics
- Disaggregation of statistical data for sub-sectors
- Undertake economic overview
- Sector in context

STEP 3: PRIMARY DATA COLLECTION

The aim of this step is to collect comprehensive information from employers and major role-players in the sector. The results will reveal trends and challenges experienced in the sector with regards to skills development, skills scarcities and hard-to-fill vacancies. In addition, this process will reveal some quantifiable results, such as entity size, employee demographics and geographic distribution.

The results gained through the primary data collection process will supplement and inform any gaps with regards to the desktop research undertaken and will inform the labour demand forecasting model in the form of proxies and indicators.

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For the primary data gathering, the following actions were undertaken:

- **Workshops (focus group discussions)**
  Three workshops were hosted in three provinces, with representative stakeholders for the transport sector. These representatives were divided into smaller focus groups, where extensive discussion took place. The discussion topics included (but was not limited to):
  - The economic contribution of the sub-sector/Chamber
  - Prominent role-players and stakeholders
  - International trends impacting the particular sub-sector/Chamber
  - Key change drivers that will impact the particular sub-sector/Chamber
  - The impact of skills development on the particular sub-sector/Chamber
  - Skills dominating the particular sub-sector/Chamber
  - The anticipated change in skills/new skills
  - Hard-to-fill Vacancies (HTFV) and other skills gaps
  - Scarce skills within the particular sub-sector/Chamber

  The workshops were hosted in the following locations:
  - Cape Town: 21 August
  - Durban: 23 August
  - Kempton Park: 29 August

- **TETA Chamber Executive Officer Interviews**
  Interviews were conducted with each of the eight Chamber Executive Officers within TETA. The aim of the interviews was to gain insights into each of the Chambers from TETA's perspective, and to unearth the valuable knowledge and experience that the Executive Officers carry of each of the Chambers.

- **Stakeholder Interviews**
  Interviews were conducted with stakeholders from the different sub-sectors/Chambers. Semi-structured interviews were prepared. The discussion topics were the same as those listed for the focus group discussions above.

  Representatives from the following entities were interviewed:

Table 2-1: Entities interviewed

Chamber/sub-sector	Entity/organisation	Number of representatives interviewed
Forwarding & Clearing	The South African Association of Freight Forwarders (SAAFF)	1
Aerospace	Airlines Association of South Africa (AASA)	1
Road Freight	Imperial Logistics	3
	National Bargaining Council for the Road Freight and Logistics Industry (NBCRFLI)	
Freight Handling	The South African Association of Freight Forwarders (SAAFF)	1
Maritime	South African Maritime Safety Authority (SAMSA)	2
Taxi	National Taxi Alliance (NTA)	1
Rail	Transnet Freight Rail	1
Road Passenger	South African Bus Operators Association (SABOA)	1
Overall	Department of Transport (DoT)	2
Total		**13**

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- **Surveys**
  A questionnaire was developed using SurveyMonkey and emailed to respondents. Contact details were obtained from the Levy Paying Database, as received from TETA.

  Details regarding the sample size and response rate are set out below:

Table 2-2: Sample size and response rate

Total respondents contacted (emails sent out)	939
Valid email addresses	737
Responses received (incl. incomplete questionnaires)	237
Valid responses	193
Response rate (valid responses)	26%
95% confidence level with a margin of error of approximately **6%**	

STEP 4: DATA ANALYSIS AND LABOUR DEMAND FORECASTING

This step entailed the cleaning, verifying and back-checking of all collected data to ensure that the quality and reliability of the data was held to the required standard. This was followed by the extraction and analysis of the data to identify pertinent trends and to supplement and integrate results with desktop research findings.

The second part of this step entailed the forecasting of the labour demand for the transport sector. Urban-Econ has developed the ***"U-E Economic and Labour Forecasting Model"*** which was customised to the transport sector to give a future projection of labour and skills demands for the sector for the next five years.

The ***"U-E Economic and Labour Forecasting Model"*** was informed by data extracted from all TETA and employer databases, all official economic and labour force statistics, as well as proxies and indicators derived from primary data collected in the previous step. The model comprises the following features:

- Built-in development assumptions, drawing from the information (ratios, standards, market indicators, coefficients, etc.) derived from the preceding data extraction exercise.
- The model accepts the various items of labour and skills input data and assumptions independently for different Chambers in the transport sector.

Pertinent data was captured into the model framework and demand forecasting was generated based on available data and inputs. The ultimate purpose of this model is to forecast the skills demand for different occupations in the various Chambers that form part of the TETA landscape.

STEP 5: RECOMMENDATIONS AND STRATEGY

This step entails the conglomeration of all preceding steps to deliver a comprehensive report. This report will set out key findings and recommendations which will allow TETA to update Chapter 1 of the SSP with up-to-date and relevant information, as well as a forecast of skills demand for the next five years.

The following actions were undertaken as part of this step:

- Formulate key findings and implications
- Compile draft Strategy and integrated repot

STEP 6: PROJECT CLOSE-OUT

During this stage, the final actions to finalise the project will be undertaken. The client will be granted the opportunity to scrutinise the draft report and to provide inputs, comments and recommendations to finalise the report.

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After all inputs have been integrated, the report will be finalised and submitted to the client. The results, strategy and recommendations evident from the study will be presented to the TETA board/Executive Committee.

All developed datasets, metadata and raw data will be submitted to TETA for their records and future reference.

The actions for this step are:

- Client review and feedback on draft report
- Report finalisation
- Meta data collated, indexed, filed and handed over
- Development of comprehensive set of MS PowerPoint slides for TETA use

The deliverables for this step are:

- Final integrated report
- Meta data

2.2 LIMITATIONS, CHALLENGES AND MITIGATING MEASURES

To date, some limitations and challenges have been experienced. These are discussed below:

SIC-CODES AND MISMATCHES

The research into the TETA sectors is limited as the sub-sectors demarcated to TETA are not in all instances clearly aligned with the Standard Industrial Classification (SIC) codes on which economic data is based and which is used by institutions such as StatsSA and Quantec. This limitation is further amplified by the fact that data from these official sources are collated and reflected at a higher level (three digits) than what is used by TETA (five digits). It was furthermore discovered that TETA and StatsSA still report data using SIC 5th edition of the codes, while other sources report data using the SIC 7th edition.

As a result, the data obtained through official statistics could represent either broader or narrower sectors than those specifically falling under TETA's mandate. This makes reporting in line with the Chambers of the TETA challenging. The relationship between SIC codes utilised by TETA, reporting and subsequent implications are discussed in detail under ***Section 3: TETA Mandate and Sector Policy Environment***.

LEVEL OF SECONDARY DATA REPORTING

During the desktop research, it was found that no standardised method of reporting on the transport sector exists. Available research varies from detailed reports into specific aspects of a sub-sector to overviews of sub-divisions. None of the secondary data sources could provide specific economic statistics per sub-sector/Chamber, which can be attributed to the fact that national reporting is done at the three-digit level as explained earlier.

LABOUR DEMAND FORECASTING MODEL LIMITATIONS

The labour demand forecasting model are based on historic sectoral economic and employment growth. Regression analysis was used to establish a relationship between economic growth (GDP) and employment growth. This was projected into the future to determine the future labour demand for the Transport sector.

Occupation demand figures and actual occupations were based on WSP/ATR data, which record the occupations in which training activities took place. This has two implications/limitations for the results derived from the model:

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1. WSP/ATR submission rates, and quality of WSP/ATR data influence the occupation and skills need. Poor submission rates and poor quality data may present a skewed picture of occupation and skills needs. ***To this end it is important for each Chamber to critically interrogate and moderate the forecasted results.*** The forecasted results are meant to guide the Chambers and to provide an indication of whether the priority focus areas are representative of the occupational demand, as expressed through the ATR results.
2. Because WSP/ATR data reflects only occupations that are currently existing, the results gained from the model can only provide forecasts for occupations that are currently active or relevant within the Transport Sector. The model cannot forecast future occupations that have not been derived or created yet – the model was not built using future foresight methodology.

STUDY SCOPE LIMITATIONS

This study was limited to profiling the Transport Sector and to provide forecasted skills requirements for the Sector. While the study included the identification of future trends and forecasted skills requirement through stakeholder engagements and existing literature, it did not entail the quantification of future skills, future occupations and the requirements for these future occupations.

It is recommended that TETA undertake a study on future jobs in using future foresight methodology to assist TETA in moving its planning beyond the identification of current skills, towards long-term and future skills demand.

The following table sets out the limitations/challenges experienced up to this point, as well as the mitigating measures deployed to minimise the effects on the outcome of the study:

Table 2-3 Limitation and challenges experienced

LIMITATION/CHALLENGE	RISK LEVEL	MITIGATION
Re-classification of SIC codes to national information cannot be done	Medium	✈ The reporting level of the transport sector was scrutinised ✈ Urban-Econ was able to source statistical/economic data from Quantec disaggregated according to the following level: 🚌 Land transport, transport via pipe lines 🚌 Water transport 🚌 Air transport 🚌 Auxiliary transport ✈ Shortcoming addressed through providing secondary data where applicable ✈ In some instances, the fundamental differences in the economic activity considerations were too difficult to overcome. The transport activities that are perceived as not making large enough contributions to the sub-sectors were excluded from total economic calculations. Please refer to ***Section 3: TETA Mandate and Sector Policy Environment***
Level of data reporting not done at sub-sector level	Medium	
Labour demand forecasting results influenced by the quality and submission rate of WSP/ATR data	Medium	✈ It is recommended that Chambers critically interrogate and moderate the forecasted results ✈ Stakeholder engagements to workshop the forecasted results to be undertaken by TETA
Study limited to identifying but not quantifying future occupations	Low	✈ It is recommended that TETA undertake a study on future jobs in using future foresight methodology to assist TETA in moving its planning beyond the identification of current skills, towards long-term and future skills demand.

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3. TETA MANDATE AND SECTOR POLICY ENVIRONMENT

This section provides an introductory overview of TETA and its operations as the training and education authority for the Transport sector in South Africa. This section also highlights the policy environment governing the transport sector in South Africa.

Profiling the Transport Sector from the perspective of TETA requires an understanding of the policy environment within which both TETA and the greater Transport Sector functions. Both these two environments have a direct and indirect influence on the skills required within the sector. Policy directives may however differ depending on the sub-sector and defined objectives.

The following section focusses on the major applicable national policies, strategies, frameworks and legislation that guide SETAs and skills development. The section also looks at the different transport sub-sectors with regards to their functions and development efforts in South Africa. This is done against the backdrop of the broader national development guides and objectives.

3.1 TETA MANDATE

The Transport Education and Training Authority (TETA) was formally established in accordance with the Skills Development Act, Act 97 of 1998, on the 20th of March 2000. The Authority superseded the sector's five Industry Training Boards (ITBs), which dissolved at the same time the SETA was established.

As a public entity, TETA reports to the Minister of Higher Education and Training (DHET) under the oversight of National Treasury in terms of performance management and financial administration. Furthermore, TETA is governed by the following Acts of Parliament,

- Skills Development Act No 97 of 1998, as amended
- Skills Development Levy Act No 9 of 1999
- The South African Qualifications Act No 58 of 1995
- The Public Finance Management Act No 1 of 1999 (TETA, 2018)

Together with national directives, the legislation, policies and strategies governing TETA (and all other SETAs) are aimed at achieving real improvements in the lives of all South Africans through employment creation, infrastructure development and improved education opportunities. Skills development and capacitation is a means of achieving this, as illustrated in Figure 3-1 below.

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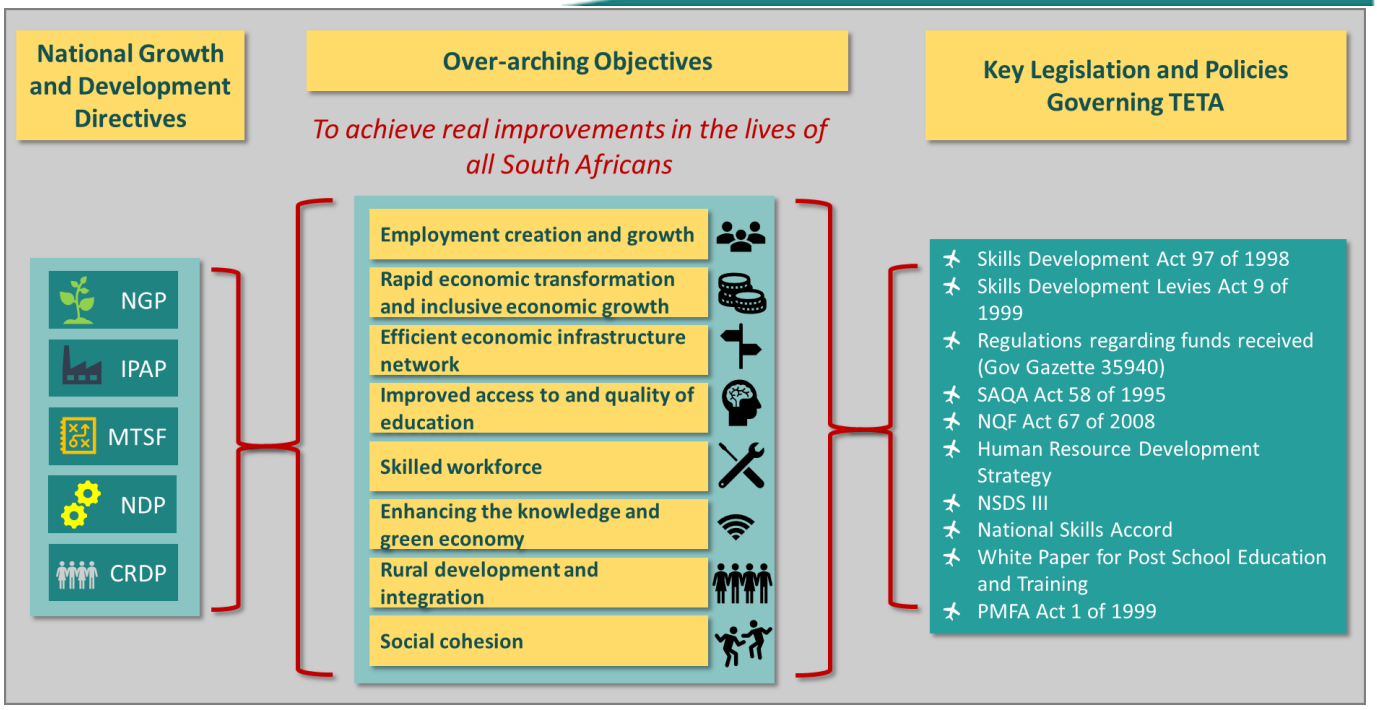

Figure 3-1: Directives governing TETA

TETA operates across eight demarcated sub-sectors, and is tasked with the responsibility of education, training and skills development in each one. Each sub-sector falls under a relevant Chamber responsibility, namely:

- Aerospace,
- Forwarding & Clearing,
- Freight Handling,
- Maritime,
- Rail,
- Road Freight,
- Road Passenger, and
- Taxi Sub-sectors (TETA, 2018).

TETA's skills development programmes are informed by its outcomes-based strategic goals. The strategic goals in turn are driven by a framework from the dictates of the NSDS III, contemporary national priorities, the transformation agenda and the Transport Sector needs. The transformation imperatives TETA follows are that of gender, youth, geography, race, class, disability and HIV/AIDS (Annual Report, 2016).

In line with its skills development aims, TETA is working toward increasing the uptake of learning in the transport industry. This involves capacitation of lecturers in various forms, such as establishing transport related curriculums, student bursaries, and graduate work placements, internships, research chair, learnerships and skills programmes. In taking up challenges posed by the White Paper for PSET, it is also TETA's mandate to focus extensively on high level PIVOTAL programmes such as doctoral studies, leadership and innovation programmes and to align itself to themes such as the green economy and how it relates to the transport and logistics sector (Annual Report, 2016).

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PRIMARY FUNCTION OF TETA

TETA's primary function revolves around advancing the objectives of the National Skills Development Strategy (NSDS III) through sector-driven training programmes and workplace opportunity creation. Therefore, TETA should develop and implement a Sector Skills Plan (SSP) for the Transport sector through activities that can be described as follows:

- Registration and implementation of learnerships, skills programmes and strategic initiatives;
- Approval of Workplace Skills Plans (WSPs);
- The allocation of levy grants to stakeholders; and
- Conducting quality assurance of education, training and development (ETD) activities within the scope of the Transport sector (TETA Annual Report, 2016).

The White Paper on PSET, in support of NSDS III, expanded SETA skills development interventions to focus increasingly on the design, funding and support of PIVOTAL programmes

In accordance with its primary function and the SSP — to identify priorities for skills development in the Transport sector — TETA develops and implements an annual SSP that is informed by workplace skills plans, annual training reports, and grant submissions (described below) from levy-paying companies in the industry. The SSP is further enriched by extensive research well beyond what can be extracted from WSP/ATR and other internal databases.

Documents such as WSPs, ATRs and grant applications bring to light sub-sector contributions to employment, scarce and critical skills gaps in each sub-sector, and industry skills demand needs, thus revealing where training should be allocated, as well as informing TETA's targets and budgetary requirements. It is important that the submissions made are credible as they inform TETA's SSP development which includes the creation and provision of a multitude of learnerships, skills programmes, bursaries, work-integrated learning opportunities, internships, and apprentice-based modules (MG Policy, 2017).

The activities and documentation that is at the core of the Transport SETA are described hereunder.

The Sector Skills Plan (SSP)

The SSP is a comprehensive, analytical document that details current labour market trends, supply and demand dynamics, growth prospects and performance of the Transport sector. The document is thoroughly researched to be a sound instrument that informs the strategic, policymaking and annual plans of TETA. Its principle aim is to guide training and skills development initiatives in the Transport sector and designated sub-sectors. The SSP consists of five main chapters, which tackles thematic priorities and issues, as well as making projections and recommendations toward skills development in the Sector (TETA SSP, 2016).

Workplace Skills Plan; Annual Training Report (WSP/ATR)

The WSP and ATR are accompanying reports that levy-paying organisations are required to submit annually in order to qualify for grants. The documents, respectively, provide a quantitative plan within the levy paying organisation for the forthcoming year, and a report on performances from the previous year. More specifically, the WSP reports on the organisation's plans to address priority training and development needs, while the ATR reports on the number of education, training and development interventions conducted against the last WSP.

The submissions together contribute to the Sector Skills Plan's overall skills demand estimations and sectorial trends. The data submitted is compiled into what is called the WSP/ATR database and used to calculate the response rate of the companies in each of the sub-sectors. The data is classified according to:

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- The number of employees in the company
- The company's provincial location
- The company's Chamber or sub-sector
- The company's SIC code and Skills Development Levy (SDL) number (TETA SSP, 2016).

Furthermore, Regulation 9 of the SETAs Grant Regulations, effective since 2007, dictates the TETA Grant Criteria and Disbursement Schedule. The Skills Development Act, Skills Development Levies Act, and skills development Grant Regulations are some of the key applicable laws under which grant payments are made to TETA-registered levy-paying organisations. Grant payments are made in the form of Discretionary Grants (DG) and Mandatory Grants (MG), and these are defined as follows:

Mandatory Grant

A Mandatory Grant (MG) is a grant payable to levy-paying companies who submit their WSPs, ATRs, PIVOTAL Training Plan (PTP) and PIVOTAL Training Report (PTR) by the 30th of April each year. The SETA pays back 20% of the total levies paid by the employer upon approval of their WSP and ATR submissions. Potential Mandatory Grants that are not claimed in a year are transferred to the Discretionary Grant fund reserve (MG Policy, 2017).

Discretionary Grant

The Discretionary Grant (DG) is in support of skills development and training that assists workplace transformation and the implementation of the NSDS III objectives and other national initiatives. The grant provides support to such individuals and entities that are levy-paying, non-levy-paying, small businesses, cooperatives and non-profit organisations, training providers or other stakeholders in the Transport sector that meet the criteria. The DG is approved and disbursed to applicants against criteria and categories of grants as determined annually by the Accounting Authority

Moreover, under the terms of the Grant Regulations, a SETA is required to allocate 80% of its available DGs within a financial year to PIVOTAL programmes that address HTFV. TETA is allowed to allocate a maximum of 20% to fund other programmes and includes unspent Mandatory Grants (DG Policy, 2018).

3.2 KEY LEGISLATION GOVERNING THE TRANSPORT SECTOR

This section briefly highlights the key legislation and policies governing the transport sector in South Africa.

Organisationally, South Africa's Transport sector is divided into eight Chambers or sub-sectors according to the four modes of transport. These are represented as follows:

a) Land (Rail, Road Freight, Road Passenger, Taxi),
b) Air (Aerospace),
c) Sea (Maritime), and
d) Inter- or Multi-modal (Forwarding & Clearing, Freight Handling).

Legislation governing each of the modalities and their respective sub-sectors are outlined in further detail below.

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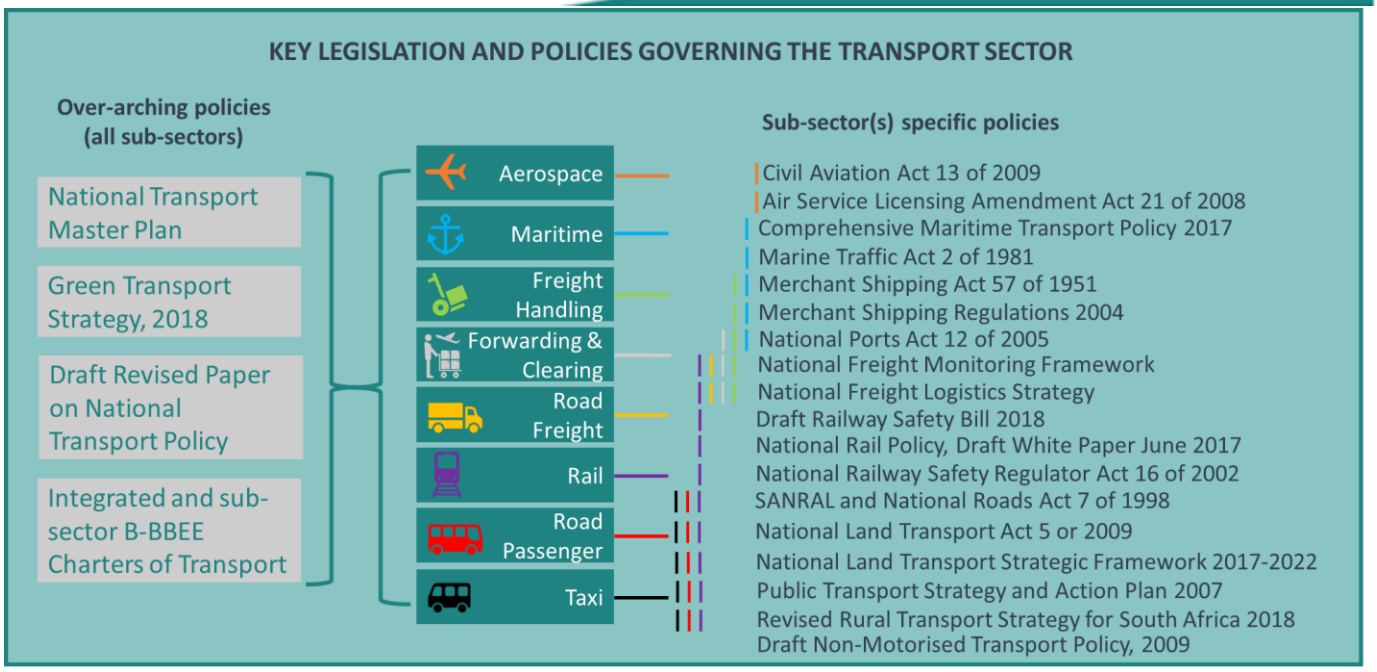

Figure 3-2: Key legislation and policies governing the transport sector

Table 3-1 Legislation governing the Transport Sector in South Africa

Overarching (all sub-sectors)	
✈ National Transport Master Plan (NATMAP) 2050 ✈ Draft Revised White Paper on National Transport Policy ✈ The Integrated and Sub-sector B-BBEE Charters of Transport	
Land	
Rail	✈ National Freight Monitoring Framework ✈ National Freight Logistics Strategy ✈ Draft Railway Safety Bill 2018 ✈ National Rail Policy, Draft White Paper June 2017
Road Freight	✈ National Freight Monitoring Framework ✈ National Freight Logistics Strategy ✈ Revised Rural Transport Strategy, 2018
Road Passenger	✈ SANRAL and National Roads Act 7 of 1998 ✈ National Land Transport Act 5 of 2009 ✈ National Land Transport Strategic Framework 2017-2022 ✈ Public Transport Strategy and Action Plan 2007 ✈ Revised Rural Transport Strategy, 2018
Taxi	✈ SANRAL and National Roads Act 7 of 1998 ✈ National Land Transport Act 5 of 2009 ✈ National Land Transport Strategic Framework 2017-2022 ✈ Public Transport Strategy and Action Plan 2007 ✈ Revised Rural Transport Strategy, 2018
Air	
Aerospace	✈ Civil Aviation Act 13 of 2009 ✈ Air Service Licensing Amendment Act 21 of 2008
Sea	
Maritime	✈ Comprehensive Maritime Transport Policy 2017 ✈ Maritime Traffic Act 2 of 1981 ✈ Merchant Shipping Act 57 of 1951 ✈ Merchant Shipping Regulations 2004 ✈ National Ports Act 12 of 2005
Inter or multi-modal	

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Forwarding & Clearing	✈ National Ports Act 12 of 2005 ✈ National Freight Monitoring Framework ✈ National Freight Logistics Strategy
Freight Handling	✈ Merchant Shipping Act 57 of 1951 ✈ Merchant Shipping Regulations 2004 ✈ National Ports Act 12 of 2005 ✈ National Freight Monitoring Framework ✈ National Freight Logistics Strategy

3.3 STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES DEMARCATED TO TETA

The Standard Industrial Classification of all Economic Activities (SIC) is the comprehensive classification structure of economic activities in South Africa. The SIC is based on the United Nations (UN) International Standard Industrial Classifications of all Economic Activities (ISIC) and follows a set of agreed concepts, definitions, principles and rules (Stats SA, 2012).

The SIC codes in South Africa are coordinated by the Survey Standards division within Stats SA and are drafted in accordance with the Standard Development Life Cycle (SDLC) following the "Good Practice Methodology for standardisation in Stats SA" approved by the Statistician-General (Stats SA, 2012). The aim of the SIC is to ensure a standardised format for collection and reporting of economic data to enable uniform economic analysis, decision- and policymaking.

The quality of statistics and studies produced according to SIC depends largely on the "correctness of the codes assigned" to the units of economic activity. It should be noted that although SIC 7th edition codes have been drafted and are in circulation, they are not widely used (Stats SA, 2012).

The 7th edition of SIC was published in 2012, with a memorandum from the Acting Deputy-Director General to the Statistician-General (dated 2013) recommending that the South African Revenue Services (SARS) implement SIC 7th edition in an effort to allow the administrative system to be aligned to future planned improvements of the Stats SA statistical system. It was indicated that until such a time that Stats SA have sufficient funding to implement the SIC 7th edition, Stats SA will continue to use the 5th edition (Stats SA, 2013).

The SIC 7th edition is substantially more detailed than previous versions. In addition, the 7th edition of the SIC Codes directly responds to the requests of the producers and users of the statistical classifications. It is also more closely aligned to International SIC (ISIC) mentioned earlier. Inconsistency in how the data is depicted becomes an issue as the economic activities described remain the same, however, how the activities are defined and categorised differs. In SIC seventh edition, classification of the codes still goes up the five digits, but the categories have changed to section, division, group, class and subclass as opposed to index, division, major group, group and subgroup in Edition 5.

The Minister of Higher Education and Training published the re-established SETAs in Government Notice No. R. 1055, 11 November 2010, which promulgates the jurisdiction of each SETA in accordance with the SIC codes. Taking into consideration that this notice pre-dates the release of SIC seventh edition and the fact that Stats SA are still reporting using SIC fifth edition, data sourced will be limited to the SIC fifth edition.

The differences in data classification and how SIC codes are assigned to TETA are discussed in more detail below (Table 3-2). The table provides the SIC codes demarcated to TETA for the Transport sector in SA as well as indicating the lowest level of disaggregated data available from Quantec (which derives its datasets from official Stats SA data).

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Table 3-2: TETA jurisdiction (SIC Codes)

Chamber/sub-sector	SIC Code	Description	Level of Data Available
Maritime	72000	Water Transport	I07174162: Water transport [QSIC 72]
	27111	Coastal Shipping	
	72112	Ocean Shipping	
	72200	Inland Water Transport	
	13100	Ocean & Coastal Fishing	No disaggregated data available for this activity (Only Agriculture, Forestry and Fisheries [SIC 1] data available). This activity's economic contribution is small in comparison to the rest of the much larger sub-sector.
Rail	71112	Railway Commuter Services	I07174161: Land transport, transport via pipe lines [QSIC 71]
Road Passenger	71200	Other land transport	
	71211	Urban, suburban/inter-urban bus/coach	
	71212	School buses	
Taxi	71221	Taxis	
Forwarding & Clearing	71232	Freight Forwarding & Clearing	
Road Freight	71230	Freight transport by road	
	94004	Waste Management	Waste Management excluded - too small a contribution to larger sector (Other Community, Social and Personal Services Activities [SIC 94]) data available. Thus, not included here.
Freight Handling	71300	Transport via Pipelines	I07174164: Auxiliary transport [QSIC 74] Transport via Pipelines does not make a significant contribution to the larger land transport SIC code under which it falls. Thus, Land Transport [SIC 71] not included here. Note that this group includes number of activities not in TETA mandate (e.g. Other transport support activities [SIC 7413] (terminal facilities, stock yards, etc.); travel and other transport agency activities [SIC 7414 & 7419]).
	74110	Cargo Handling	
	74120	Storage & Warehousing	
	74132	Salvaging of distressed vessels	
Aerospace	73000	Air Transport	I07174163: Air transport [QSIC 73]
	73001	Civil Aviation	

Source: TETA, 2018; Quantec 2018.

Table 3-2 above highlights the fundamental differences in the economic activity considerations of each sub-sector according to Quantec data referencing Edition 5. The transport activities that are perceived as not making large enough contributions to the sub-sector are excluded from total economic calculations, and this includes:

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- Maritime: Ocean and Coastal Fishing (13100)
- Road Freight: Waste Management (94004)
- Freight Handling: Transport via Pipelines (71300)
- Forward & Clearing: Freight Forwarding & Clearing (71232)

The contributions of the activities named are excluded as to not overstate their value to the overall GDP performance and growth of the sub-sector and the Transport industry as a whole. This is also done to maintain the quality and integrity of statistical information researched and published. As observed earlier, there are definitional differences describing some economic activities which result in a mismatch of SIC codes as used by TETA and other corresponding entities. The inconsistency in the design of the codes classification, as well as the mismatch of activity to sub-sector, even which source or edition is relied on, poses a challenge to any information that is informed by usage of the SIC codes. For TETA, particularly, the inconsistency interferes with the integrity of its training and skills development interventions.

The following example is used to depict how SIC codes are prescribed, which will thus reveal the discrepancies between the activities in the Transport sector as per Table 3-2:

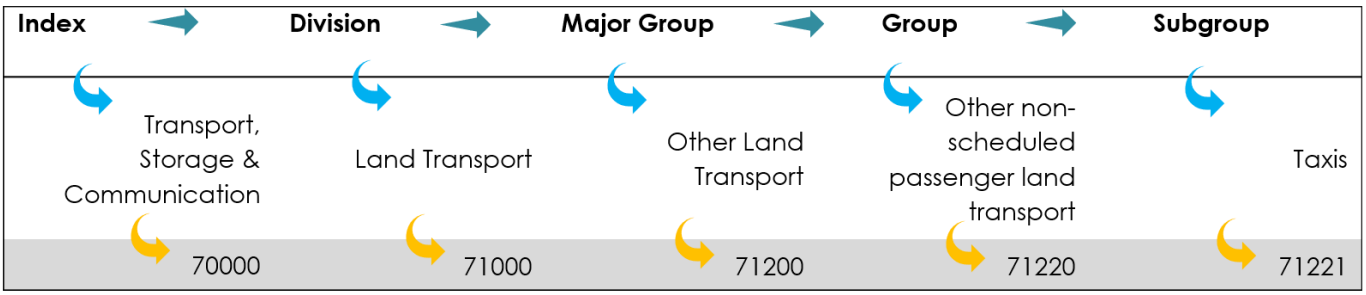

Figure 3-3: SIC code break-down

Source: Urban-Econ, 2018.

Figure 3-3 demonstrates how a SIC code is prescribed or determined. An economic sector is assigned an index number which acts as the base reference number for all economic activities that fall under its branch. The index number is then expanded to accommodate all activities or divisions that take place within the economic sector. The example used here follows the utmost extent of this break-down. Not every activity is sub-indexed into as many groups. As per the example in Figure 3-3, the SIC code for the Taxi sub-sector (71221) was determined by way of four other levels of categorisation, starting with the index category of 7000 for the Transport, Storage and Communication sector. The break-down example shows a clear pattern of continuation of economic activity classification from the core sector number, to the type of function in the sector, to the final prescribed sub-sector code.

Thus, with reference to Table 3-2, TETA's published SIC Codes, it can be identified that certain economic activities prescribed to the Transport sector could be in error, namely, Ocean and Coastal Fishing (13100), and Waste Management (94004) in the Maritime and Road Freight sub-sectors, respectively. The codes are evidently incompatible with the Transport, Storage and Communication index of 7000. Conversely, Ocean and Coastal Fishing (13100), according to the Human Sciences Research Council (HSRC) Business Sector Code Book (2006) based on version 5 SIC codes, would fit better under the Agriculture, Hunting, Forestry and Fishing index. More pointedly, it would be classified under the Ocean and Coastal Fishing major group 13100, in the Fishing, Operation of Fish Hatcheries and Fish Farms division code 13000. The same logical application would be used to prescribe the Waste Management activity to the Other Community, Social and Personal Service Activities division 94000.

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These findings thus strongly indicate that TETA's recognition of over 20 SIC codes in the Transport sector require scrupulous review. This is necessary to ensure that the skills development interventions it prescribes and undertakes is developed against accurate findings. As inferred earlier, the quality of statistics and studies produced according to SIC depends significantly on the "correctness" of the codes assigned to the units that measure economic activity in a sector.

BOX 1: OCEAN AND COASTAL FISHING - 13100

Sub-sectors demarcated to TETA Chambers are not in all instances clearly aligned with the SIC codes on which economic data is based.

The Maritime Chamber includes *"Ocean and Coastal Fishing (13100)"* which are traditionally reported under agricultural activities. This means that the data obtained through official statistics cannot isolate code 13100 to be included in the Maritime Chamber to provide a clear profile of the Chamber.

The rationale for the inclusion of code 13100 stems from the fact that training needs and competency requirements for seafarers aboard a fishing vessel are the same as for seafarers aboard a cargo vessel or passenger ship.

*The **Ocean Economy** refers to all ocean-based activities that use the ocean as a main resource point for input or output products or services*

Rebuilding the Scope for the Transport Sector

Although transport serves as a means to enable inputs and outputs in the supply chain of the ocean economy, it is in fact not a direct and sole ocean-based activity. It enables ocean-based activities to take place and serves as a means of freight and passenger transportation through the ocean. As per the definition and characteristics provided for the ocean economy, under which Ocean and Coastal Fishing (or Fisheries) features, transportation is not considered an activity related to the production, processing and development of ocean resources. Transportation is also not related to activities that receive outputs from the ocean or contributes input to the ocean's activities.

The two economic sectors cannot be fully integrated and this proves the challenge that TETA faces with having the SIC Code 13100 under its demarcation. Moreover, the Transport industry gives inputs into multiple industries, but not each industry it serves is demarcated to the sector.

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4. THEORETICAL FRAMEWORK

The transport sector is characterised by a great diversity and different transport modes that come with different technologies, regulations, challenges and know-how and skills requirements. According to various authors (Rodrigue, 2017); (Gijsbers, et al., 2009), the main categorisations can be made as follows:

1. **Air transport** (passenger and freight);
2. **Sea/ocean transport** (passenger and freight);
   - International high sea transport
   - Ship transport on rivers, canals and lakes
3. **Rail transport** (passenger and freight);
   - Subway, metro and tram system
   - Domestic trains
   - International trains
   - High speed trains
4. **Road transport** (passenger and freight);
   - Passenger transport (bus, coach and taxi)
   - Short distance freight trucks (heavy and light)
   - Long distance freight trucks (mostly heavy)
5. **Pipeline transport** (hazardous and non-hazardous substances)
   - This system of transportation involves the use of hollow pipes in the transportation of water, crude oil (petroleum) and gas.

It is important to note that the categories identified through the literature above follow the same general classification as SIC classification, although it does not categorise inter-modal transport (Freight Handling and Forwarding & Clearing) as a separate category of transport. However, the literature does indicate that the **inter-modal transport chain** is key to the efficient functioning of the different transport modes and that it has a direct impact on each category's environmental sustainability (Rodrigue, 2017); (Gijsbers, et al., 2009).

Inter-modal transportation prevents the segmentation of various transport systems. As put by Rodrigue, Comtois and Slack (2006), inter-modal transport chain makes use of the advantages of different transport modes (e.g. between Rail and road) that are neatly tuned to each other, thus keeping transfer time and cost (for passengers and freight) between the different modes at a minimum.

Modern inter-modal systems already allow for fully automated cargo inter-modality (Hanaoka & Regmi, 2011) which are becoming generally more prominent and important in logistics and Freight Handling. Hanaoka and Regmi (2011) also report that some of the largest cargo ports already operate mostly autonomously with humans serving mainly in planning, controlling and programming. This has a direct influence on the types of skills required, as well as the number of individuals required to execute these functions.

The important role of the transport sector and its different sub-sectors in terms of development, the economy and its impact on the environment, are discussed in the subsequent sections.

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4.1 CATALYTIC ROLE OF THE TRANSPORT SECTOR AND LINKAGES TO DEVELOPMENT

BRIEF HISTORIC RECOUNT

Transportation developments have taken place since the beginning of the industrial revolution. Adams (1970) in his article "Residential Structure of Mid-Western Cities" traces the history of metropolis within the framework of four transportation related eras, i.e.:

I. Walking – Horsecar Era (1800 – 1890);
II. Electric Streetcar Era (1890 – 1920);
III. Recreational Automobile Era (1920 – 1945); and
IV. Freeway Era (1945 – present).

Each growth stage (or stage in the spatial evolution) is dominated by a particular movement technology and a network-expansion process that shaped a distinctive pattern of intra-urban spatial organisation. According to Adams (1970), Giuliano and Hanson (2004), during Eras I and II, the cities were compact centres of development built around railroads and ports. During Era III, with the arrival of the automobile and increasing population, the city size exploded as more people started moving to the fringes in search of cheaper land and housing. The construction of the freeway system, during Era IV, was the biggest catalyst to suburban growth, which reached its peak during the 1960s and 1970s (Giuliano & Hanson, 2004). According to Adams (1970), the freeway system promoted a network far from the idealised concept of the compact city of the transit industry thereby facilitating urban sprawl.

Shortly after South Africa became a democratic regime in 1994, the country's transport system could be described as third-rate, chaotic and unregulated (Orcutt, 1997). Spatial engineering in the apartheid regime was tailored to control urbanisation and to restrict the traffic of black populations into industrial areas to the labour needs of the particular city, town or region. Land use and subsequently transit systems were designed to keep black populations on the outskirts of economic activity. This aspect fundamentally defines the country's transportation system as it stands today. Large segments of SA's black workforce is still restricted to residential social and economic activity and are burdened with extensive travel distances and costs to reach commercial and industrial areas.

Some of the definitive characteristics of the apartheid transport policy speaks to the current status of the transport system's infrastructure, particularly that of road and Rail networks, such as: insecure and ailing Rail networks which were mainly preserved for use by black populations; the failure or inadequate regulation of the Taxi industry; the country's poor road safety record; the poor consideration given to the environmental impact of transport projects carried out during the past regime. In essence, transport decision-making was mostly unaccountable and bureaucratic and often featured in anti-apartheid politics as it disproportionately affected rural and urban dwellers (Orcutt, 1997).

Another example of infrastructural challenges based on past policies is seen in the Maritime sector. The results of poor port planning, inappropriate land use and a failure to invest in proper infrastructure design up until 2005, at least, are seen in the inadequate provision of multi- or inter-modal facilites at important port and land interfaces across the country (NFLS, 2005). This is particularly evident in the bulk export of commoditiies where SA trades milllions of tons in coal and iron ore, for example.

The infrastructural challenges brought on from poor planning and design in the past negatively impact on the productivity and operational efficiencies of today. Poor human capital development in key transport industries exacerbate issues of inadequacies such as congestion, poor turnaround times, poor productivity and service delivery, and the continued lack of necessary investment, especially in comparison to

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international standards (FNFLS, 2005). Ports, Rail and road networks face large capital and revenue backlogs resulitng in diminishing efforts despite the governments exorbitant expenditure on transport infrastructure. There are massive capacity gaps in the Transport industry where infrastructure and operations are intended to meet in order to address growing and evolving market demands. Past policies and planning have therefore put unforeseen constraints on the transport system's infrastucture that results in it not being able to adequately satisfy the demands of the economy. This robs the sector of significant value and threatens to have long-term adverse effects on its sustainability and competitiveness in global markets.

Interventions such as the Bus Rapid Transport (BRT) systems or trying to formalise the Taxi industry are legislated to reverse the inadequate and failing infrastructure from the apartheid regime. South Africa's transportation policy must simultaneously work towards upgrading transport infrastructure and updating its systems; at the same time, not ignoring the integration of neglected areas into main transport networks. This will not only improve the quality of life for the nation, but it is a necessary catalyst for economic integration, redistribution and development. Continually improving on inherited transportation systems and networks will rectify the urban and rural imbalances seen across the land that contributes to the lagging social, economic and political transformation the government hoped for in the 1990s.

A central feature of the South African transport system today was founded as a mechanism for the working class to access metropolitan and commercial areas during the apartheid regime: The Taxi industry. "Kombis", or the Taxi industry, was largely born from apartheid policy's failure to invest into adequate public transport for all populous segments of the country (Orcutt, 1997). However, it served a greater need, which was to simply provide commuters easy points of entry into places of work and trade. As a matter of fact, the formulation of a Taxi industry would form the foundation of present day's informal economy in the Transport sector. Spatial disparities in South Africa's Transport infrastructure is closely linked to the development of its informal or second economy (see ***The informal economy in the transport sector***).

South Africa's seven primary corridors (national and SADC) are also largely affected by the policies and planning of the apartheid government. The corridors are currently not equipped to handle the growing capacity of volumes and freight traffic based on future projections for freight and passenger transportation. Freight volumes for the Gauteng-Durban corridor was predicted at about 57 million tons in 2020. At the time of the study referenced here (NFLS, 2005), the corridor was already close to capacity at 53 million tons with an expected growth rate of 38% by 2020 (please see Figure 4-1below).

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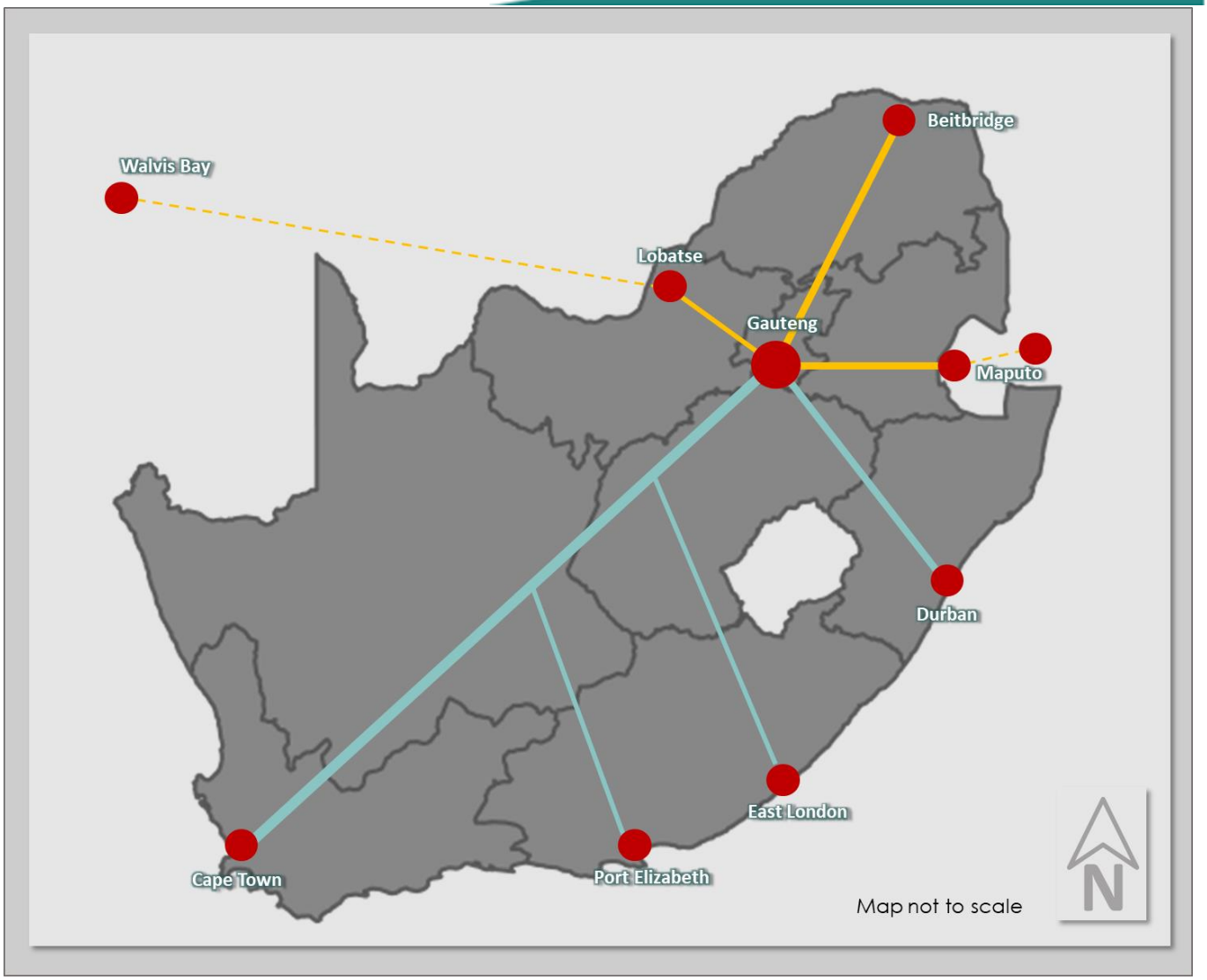

Figure 4-1: South Africa's seven primary corridors

Source: NFLS, 2005

The Rail transport system also reached its capacity earlier than predicted because of operational inadequacies such as ineffective infrastructure and lack of trained people to handle growing demands. Freight moving across border posts are a challenge too, as linkages between African countries were not a priority for the apartheid government; traffic is not balanced, and road and Rail conditions are in poor form. Many of the major roads as well as secondary roads were not designed to support heavy vehicles carrying overloads, which is often the case of today's Road Freight system, particularly between borders and major traffic corridors. These elements have a limiting impact on freight growth between SADC regions. Maritime ports will face the same challenge as the projected volumes for 2020 is beyond the sub-sector's current capacity.

Moreover, the government today is tasked with repairing a myriad large-scale infrastructural and systemic issues inherited from the past regime. Transport polices are slowly progressing to accommodate current and emerging matters, but not efficiently or quickly enough. Several high-profile projects such as the BRT system and the Gautrain were rolled out in the last decade to allow for inter-modal transportation facilities between bus, train and Taxi networks. New policies are also looking to restructure metropolitan corridors and places to establish new nodes of business in line with transformation agendas and economic growth paths. These solutions may alleviate some of the burdens the transport sector is facing; however, they

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mainly address public passenger issues. However, as it stands now, the South African Transport industry as a global international trade player is not geared to handle growth in freight volumes and linkages. The policies and spatial planning of the old government remains a negative contributor to the country's freight logistics, regional integration, and global economic competitiveness. To overcome the legacy of apartheid's skewed planning and infrastructural design, the government together with the involvement of the private sector must coordinate efforts to overcome the inherited challenges in the Transport sector and work towards meeting objectives that will grow human capital, diversify the industry and enhance infrastructure.

TRANSPORT - LAND USE CONNECTION AND THE PRODUCER CONSUMER RELATIONSHIP

The transportation – land use connection is an important concept in land use and transportation planning (Rodrigue, 2017; Waddell, 2011). Both the researchers agree that ***land uses***, on the one hand, affect transportation by physically arranging the activities that people want to access; while ***transportation***, on the other hand, affects land uses by providing a means of moving freight/goods, people, and information from one place to another. In particular, transportation links together the factors of production in a complex web of relationships between producers and consumers. Regarding the various ways of moving freight from producers to end-consumers, several functional relations and trade schemes may be identified. As pointed by Russo and Comi (2010) freight may reach end-consumers:

- without any contact points (directly), e.g. the customer buys on the web and the producer sends the products directly from the production site (white square) to their consumption site (black square);
- with one contact point that is usually called the retailer; in this case the producer uses the network of retailers (black circle) in order to reach the consumption zone; and
- with one or more contact points to consolidate or deconsolidate the load (white circle); these types of points derive from the need to reduce logistics and transportation costs.

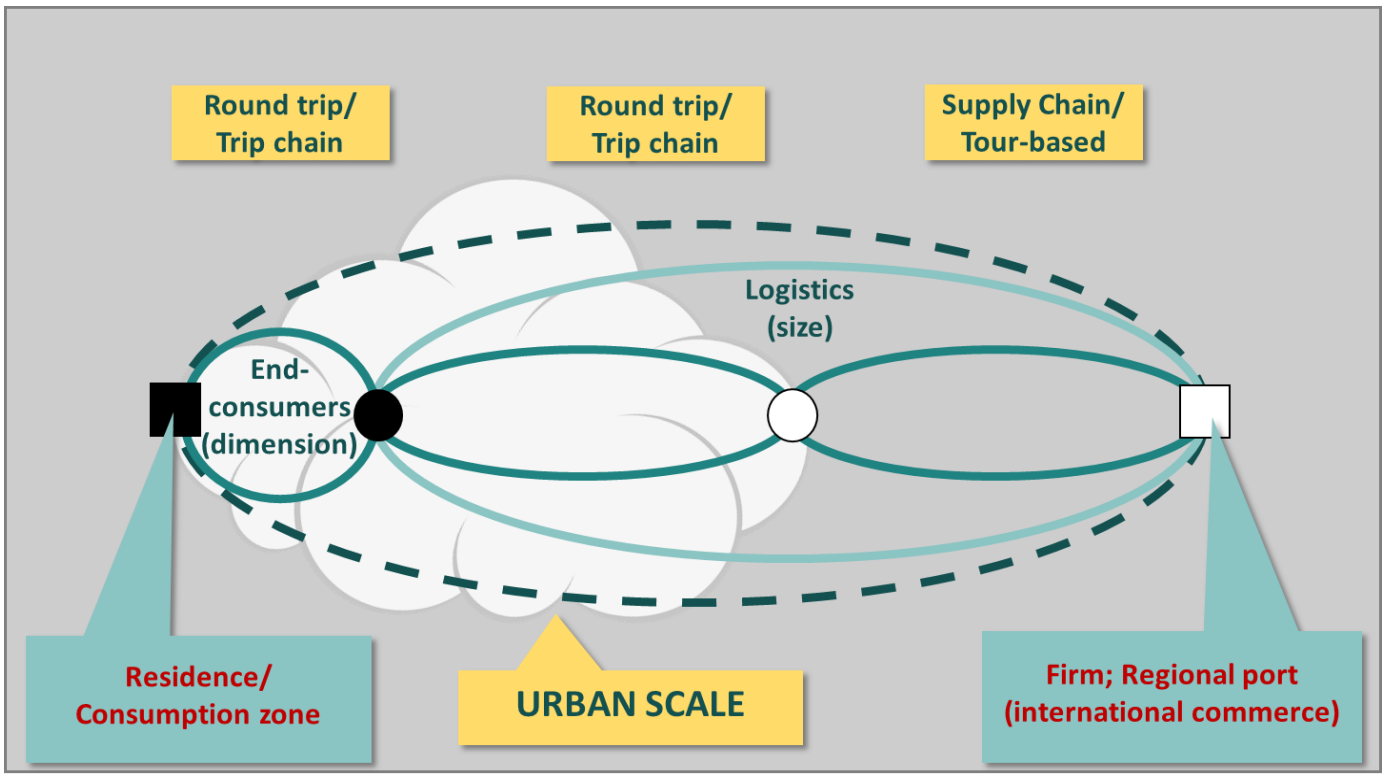

Figure 4-2: Functional Relations and Commercial Schemes

Source: Russo and Comi (2010)

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THE SUBSEQUENT ECONOMIC IMPACT OF TRANSPORT

The development role transport plays in an economy has long been recognised by researchers, particularly economic and locational theorists. The British economist John Maynard Keynes is one of the first economists who to some extent incorporated transport into his economic theory. Keynes advocated public sector intervention in the economy, including government expenditure in the form of public works and infrastructure development. Therefore, the investment in transport infrastructure is seen as a trigger for economic development (Van de Vooren, 2004).

Transportation is critical to all aspects of the economy and impacts economic development in various ways. According to Weisbrod and Cutler (2014), transportation:

- supports clusters and agglomerations;
- increases productivity;
- enhances jobs and labour market accessibility;
- opens new markets for businesses; and
- enhances supply chain efficiency.

THE INFORMAL ECONOMY IN THE TRANSPORT SECTOR

A key constituent of South Africa's economy is its informal counterpart, or what is identified as the second economy in most parts of the world. The second economy lies outside core commercial corridors, is largely rural and is characterised by economic and geographical marginalisation (NFLS, 2005). Emerging and small to medium-sized businesses look to informal business practices to sidestep services that are often inaccessible and/or very expensive. In the Transport sector, the informal economy is exposed to low production areas, poorly and non-distinguished road networks, and decentralised and uncoordinated supply chain networks. Nonetheless, the informal transport sector is a significant source of employment for many people and the segment is an important contributor to the GDP of the country. In South Africa, occupations in the informal segment of the Transport sector often involves jobs such as cleaners, security, loaders and porters in the Rail and air sub-sectors. In the goods and freight transport services casual wage labourers are common, and they are used for long distance haulage, or short-trip haulage that involves driving of lorries, vans or lightweight trucks.

In Quarter 4 (Q4) of Statistics SA's (Stats SA) Quarterly Labour Force Survey (QLFS) total employment in the Transport sector was recorded at just over a million people (Stats SA, 2018). The Transport sector is making steady employment gains in comparison to other key industries such as Construction and Mining. Moreover, the sector made significant annual employment gains in the informal segment, with a 40 000 increase from Q4 in 2016. Only Community and Social Services topped it with an annual increase of 68 000 and the Manufacturing industry came in third with an increase of 27 000 for informal employment in its industry.

Of the 1 million people employed in the Transport sector, at least 710 000 are in the formal sector while about 290 000 of the total number are in the informal sector. This means that although the informal employment segment in the Transport sector is growing, at least 70% is largely attributed to formal employment (Stats SA, 2018). At the time of writing, information was not available for the sectoral distribution of employment in the Transport sector. The distinction between which modes of transport and/or sub-sectors are dominant in informal employment or informal economic activities would add value to this section.

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Even though the informal transport sector is rapidly growing in developing countries across the globe, research on the segment is thin with limited consideration in policy-making areas. Statistics and literature on the sector in SA are particularly scant considering the economy largely comprises informal business services. Nonetheless, according to information pulled from various sources, workers in the informal transport economy share the same underlying conditions of most occupations in any informal economy. Some of the defining features of workers in the informal economy can be described as:

- Those who are poverty-stricken
- The businesses are often characterised by survivalist tendencies
- They are excluded from law, labour and social protection services
- They are often unorganised or ineffectively organised
- Their incomes are low and fragile with little job and economic security
- They have no access to training (Spooner, 2011).

The passenger transport segment in SA is largely composed of land-based passenger transport, which includes trains, buses, microbuses, cars and Taxis or "kombis" and it is commonly found that owners of the road transport vehicles employ drivers that support their public transport initiatives; other jobs in this segment include queue marshals, guards, self-employed drivers, and mechanics who are often employed outside of labour regulations. Operations and employment in the informal economy of the transport sector remains largely unregulated and decentralised. It also continues to be an inexpensive alternative to formal passenger transportation to the urban working poor.

In light of the information provided here, it is evident that the informal segment of the Transport industry is in need of certain organisational and regulatory characteristics. Based on the studies conducted on this segment in the industry (Spooner, 2011), the following aspects are identified as necessary to improve its functioning:

- Safety, social and accident protection,
- Effective transport regulations and implementation policies,
- Reliable and regulated access to routes and passengers,
- Regulation of competition with the formal transport sector as well as electronic transportation services,
- More effective and democratic organisation, both for collective bargaining and for the provision of services.

Offering this type of support to informal workers in the industry will help a significant proportion of the urban working poor. The informal economy in the Transport sector plays an essential role in supporting the livelihoods of all the urban working poor in that it provides a regular and often cheaper mode of travel to and from the workplace, markets, and customers (Spooner, 2011). Thus, support given to the informal segment in the Transport industry by extension is support given to other urban informal economy sectors, which is positive reinforcement for overall economic development.

However, not every affiliation of the informal transport economy in the sector is positive. The workers in the informal transport sector in SA, particularly those operating in Road Passenger services, are also known to have significant associational and disruptive power. South Africa has in the past and recently seen major economic and political activity in the urban informal spaces take place at Taxi ranks, bus stations, and even train terminals. There is a rise of disputes in the transport industry between existing transportation activities against emerging and more advanced forms of transportation activity. These disputes affect the livelihood of those employed in the sector and those who rely on transported products and services as part of their employment or business operations. Again, this speaks to the massive impact the transport industry

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has in the economy of the country, as well as to the influence the informal segment has on the industry and the economy as a whole.

It cannot be denied that the informal segment of the Transport sector is closely tied to its formal counterpart. In most cases, the informal segment compensates for the lack of capacity, reach or human resources in the formal segment. The informal economy across industries oftentimes fills in the gaps where the government and the formal economy fails to. The segment services the urban poor, it creates jobs for those who are excluded from access to opportunities, and it often provides opportunities for self-employment. There are large amounts of economic and entrepreneurial activity found at Rail, Taxi or train terminals, and these terminals are often state- or private-owned, thereby reinforcing the close ties between the formal and informal spaces in the sector. The informal economy of the transport sector and its relationship to the formal economy is indeed complex. Together, the two segments work in synergy towards maintaining the country's transportation capacity and economic viability. This can be argued despite the scarcity of data for rigorous comparative analysis.

The informal segment or second economy has promise to be commercialised more beneficially. Larger industrial businesses should be encouraged to incorporate spatial and logistical planning of smaller transportation providers into valuable supply chains of the industry. Inclusive interventions would include:

- Traffic consolidation that increases access to markets,
- A reduction in operation costs,
- Availing infrastructure and adopting mutually integrative strategies,
- Appropriate institutional support that deals with rural and urban logistical development,
- Greater system integration of transport nodes on the outskirts,
- Establishing "one-stop" logistics and transaction support centres and standardised operations,
- Organising co-operatives capable of generating commercially viable freight loads (NFLS, 2005).

(UNINTENDED) ENVIRONMENTAL IMPACT OF TRANSPORT

The transport sector carries an important social and economic load which cannot be neglected. The environmental impact of transport, however, is significant because transport is a major user of energy, mostly in the form of oil products. The reduction of carbon dioxide emissions and environmental conservation has become a priority in the sector. This subsection highlights carbon emissions of international transport by region and the steps taken to reduce the impact.

The relationship between transportation and the environment is paradox in nature since transportation conveys substantial socio-economic benefits, but at the same time is impacting environmental systems. As argued by Rodrigue (2017), from one side, transportation activities support increasing mobility demands for passengers and freight, while on the other, transport activities are associated with growing levels of environmental externalities.

The environmental impact of transport is significant because transport is a major user of energy. Different types of energy sources (or fuels) are used for transportation. The major types of energy used for transportation worldwide are petroleum and other liquid fuels (EIA, 2016). According to EIA (2016), transportation energy consumption increases at an annual average rate of 1, 4%, with most of the growth in energy consumption likely to occur in regions outside of the Organisation for Economic Cooperation and Development (non-OECD). In 2012, for instance, the OECD[1] nations accounted for 55% of the world's

[1] OECD comprised of 35-member states – 24 EU countries, Norway, Australia, US, Canada, Chile, Israel, Japan, South Korea, Turkey, Mexico and New Zealand.

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total transportation energy consumption, and the non-OECD nations accounted for 45% (EIA, 2016). In 2020, the OECD and non-OECD shares of world transportation energy use are projected to be equal. In 2040 the non-OECD regions are expected to account for over 60% of global transportation energy consumption.

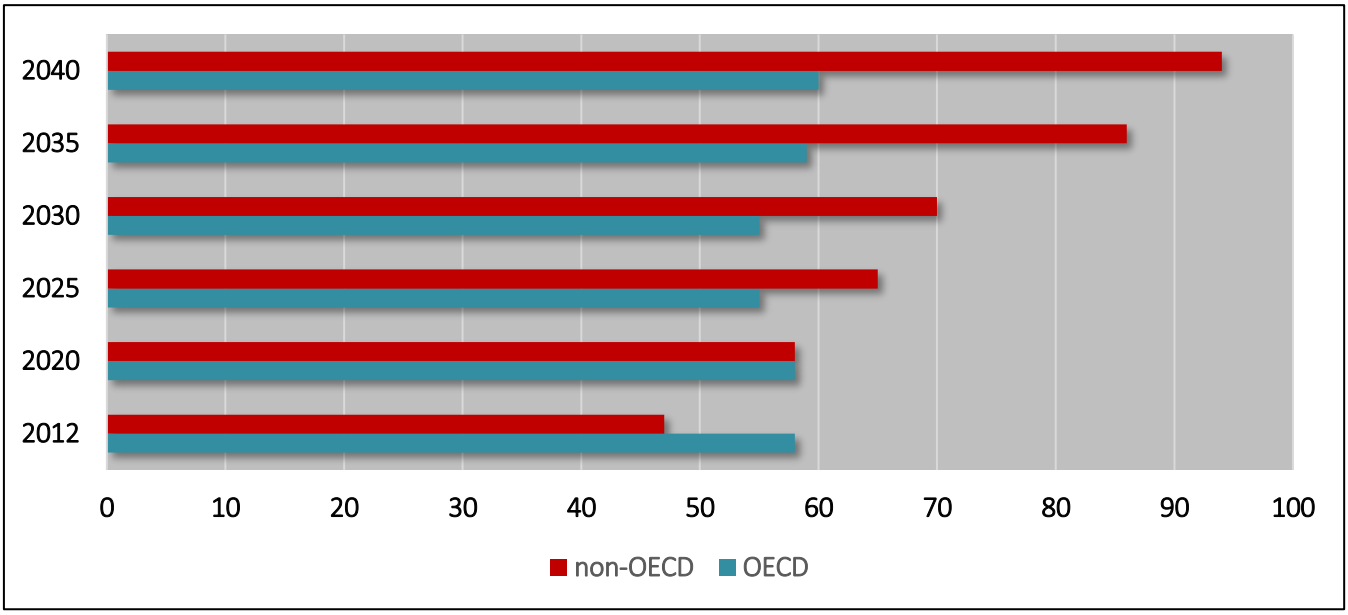

Figure 4-3: Transportation energy consumption by country grouping, 2012–40 (quadrillion British thermal units/ Btu)

Source: EIA (2016)

In several of the non-OECD regions, motorised transport emissions have become a significant contributor to the global problem of greenhouse gas (GHG) emissions that lead to climate change. GHG emissions from transport could increase by 60% by 2050 (OECD, 2017). Furthermore, the OECD (2017) states that GHG emissions from global freight alone could increase by 160%, if no additional measures are taken. This is largely due to increased use of road transport, especially for short distances and in regions that lack Rail links, such as South-East Asia.

The contribution of these emissions to local air pollution is decreasing in some parts of the world, mainly due to various *vehicle emission standards* that have been implemented all over the world. According to ICCT (CCA, 2014), over 70% of light vehicles sold in the world today are subject to **vehicle emissions standards**. Especially, in several countries such as the US, Japan and China, mandatory standards have been operating for at least a decade. Only in those parts of the world that have an extremely high growth in transport volumes have overall transport-related emissions of local air pollutants not yet decreased.

4.2 INFLUENCING FACTORS

The transport sector has contributed to the globalisation of the world economy. It connects buyers and sellers. It also transports goods across countries and breaks the barrier of distance and time. Like any other sectors, the transport sector is impacted by changes in its external environment. The influencing factors are:

- **Political and legal factors**. Political and legal factors include government intervention on economic operations or a particular sector. Transportation operates in a political environment that is very regulated and restricted. Government intervention can be necessary to protect the passengers'

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interests and transport operations' safety measures. In other words, political factors can influence transportability such as laws, regulations, borders and tariffs. When transportability is high, activities are less constrained by distance.

- **Economic factors**. A healthy economy acts as a catalyst for industrial growth. Economic health is also measured by various economic indicators. Examples of economic indicators include growth in GDP, per capital income, disposable income, industrial production, level of business, and consumer confidence. Fluctuation in oil prices is another major factor that impacts transports' profitability.

- **Social and demographic factors**. The demand for transportation has increased significantly over the years. This indicates changing travel preferences among the latest generation. Demographic factors play an important role in forecasting demand and future travel preferences.

- **Urbanisation.** Urban sprawl and decentralisation of activities results in a greater dependence on transportation – both for passengers and goods. This has a negative effect on congestion in and around urban areas and leads to greater levels of emissions.

- **Growth in motorisation.** Private vehicle ownership has a direct effect on congestion experienced within an area, as well as energy expenditure and emission levels.

- **Technological and environmental factors**. To survive the intense competition in the sector, companies must adopt the latest technology. The use of advanced technology results in lower fuel consumption. This improves efficiency and the cost of operations.

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5. INTERNATIONAL PERSPECTIVE

Internationally, transport forms part of the **transportation/transport and storage** group/sector as defined by the International Standard Industrial Classification of all Economic Activities (ISIC), which acts as the world reference classification of productive activities. The most obvious change has been the renaming from **"Transport, Storage and Communication"** of *ISIC Revision (Rev.) 3.1* in 2002 to **"Transportation and Storage"** in *ISIC Rev. 4* in 2008, with "Information and Communication" being assigned a different code (Section J in ISIC Rev. 4)(see ISIC Revs 3.1 and 4, cited in Department of Economic and Social Affairs, 2002 and 2008).

In this case, transport and storage are defined as the sub-sectors 49, 50, 51, 52 and 53 in the ISIC Revision 4. It should also be noted that the standard industrial classification of transport activities varies at international, regional and national levels. For example, SIC[2] (for South Africa) by Statistics South Africa (StatsSA) and NACE[3] (for European region) by Eurostat derived from ISIC, in the sense that they are more detailed than ISIC. ISIC, NACE and SIC have exactly the same items at the highest levels, where SIC and NACE are more detailed at lower levels. The detailed breakdowns of elements/activities by transport sub-sector as defined by ISIC (Rev. 4), NACE (Rev. 2) and SIC (7th Edition) are provided in Annexure A.

There are a number of key international transport organisations that play an important role in trade facilitation in the sector, as they represent their members in trade facilitation negotiations and are often instrumental in promoting trade facilitation measures and in implementing trade facilitation tools and solutions among their communities. The main international transport organisations for trade facilitation are as follows:

- **International Freight Forwarders Association (FIATA)** - Represents the freight forwarding industry.
- **International Air Transport Association (IATA)** - Represents the airline/aviation industry.
- **International Chamber of Shipping (ICS) and International Shipping Federation (ISF)** - They represent trade facilitation issues and employees of the shipping industry.
- **International Road Transport Union (IRU)** – Represent the road transport industry.
- **International Union of Railways (UIC)** - Represent the Railway industry.
- **SMDG** - Represents the Maritime container industry.

5.1 CURRENT REALITIES

The transport sector is one of the most important sectors within a global, regional and national economy. Its importance stems not only from its size, but also from the fact that it plays a crucial role in connecting other economic actors with each other.

The economic importance of the sector can thus be assessed from a macroeconomic perspective. In many developed countries, transportation accounts between 6% and 12% of the gross domestic product (GDP) (Rodrigue, 2017). Presently, there is no research on global transport and storage in ISIC (Divisions 49 to 53) with economic figures. As a result, few comparisons have been made across sub-sectors regarding their contribution to global GDP. Compared with the GDP contribution of other sub-sectors, the global air transport is larger, which accounted for 3,2% of the world's GDP in 2017 (IATA, 2018). The regions where this economic activity often comes from include (1) the Americas[4], (2) Africa & Middle East (AME)[5], (3) Europe,

[2] **SIC** is South Africa's Standard Industrial Classification of all Economic Activities.
[3] **NACE** is the acronym used to designate the various statistical classifications of economic activities developed since 1970 in the European Union (EU)
[4] **The Americas** selected members are the United States (US), Brazil, Mexico, Canada, Argentina, Colombia, Chile and Peru.
[5] The **AME** selected members are Saudi Arabia, Nigeria, Egypt, South Africa, Kenya, Jordan and the United Arab Emirates (UAE).

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(4) North Asia[6], and (5) Asia-Pacific[7]. For instance, in the last quarter of 2017, the air transport in the Asia-Pacific region contributed 4,2% to GDP, followed by North Asia (3,5%), Europe (2,8%), the Americas (2,5%) and AME (1,8%) (IATA, 2018).

In 2015, the transport and storage sector (NACE 49 to 53) of the EU generated a total turnover of € 3, 518 billion (Eurostat, 2017a). In value added terms as put by Eurostat (2017b), the largest sub-sector in the EU's transportation and storage sector was that of **land transport and transport via pipelines** (Division 49), which accounted for more than 42,5 % of sectoral value added, followed by **warehousing and transport support activities** (Division 52) which had a share of more than 35,4 %. **Postal and courier activities** (Division 53) was the only other sub-sector to record a double-digit share of sectoral value added (11,5 %), while **air transport** (Division 50) was the smallest sub-sector with 6,1 % share.

There is, however, also no or limited research on the sub-sectors of transport and storage with economic figures in developing regions such as Africa as compared to EU. Despite this, some developing countries (Africa) show economic growth in their transport sector. To name a few, Algeria's transport and communications sector in 2017 contributed 5,2 % (4,3% in 2016) to GDP; Benin 5,0% (2,7% in 2016); Madagascar 6,0% (3,1%); and Rwanda 11,8% (8,1% in 2016) (African Development Bank, 2018).

Looking at employment figures by transport mode, by far the most people are employed in both air and land transport industries. In a study commissioned by IATA in 2015, it was found that by 2035, air transport in the Asia-Pacific region is expected to support over 70 million jobs, compared to over 33 million jobs in 2014 (InterVISTAS Consulting, 2015). While EU's transport and storage sector employed around 11,2 million persons in 2015, around 52% of them worked in land transport (road, Rail and pipelines), 3% in water transport (sea and inland waterways), 4% in air transport and 25% in warehousing and supporting and transport activities (such as cargo handling, storage and warehousing) and the remaining 16% in postal and courier activities (Eurostat, 2017a).

SIGNIFICANT EVENTS AND DEVELOPMENTS

The sector is growing increasingly impacted by new technologies and technological changes. Especially, information and communications technology (ICT) applications are becoming more important. Some examples are modern navigation systems (GPS), driver assistance, driver augmentation, and the cockpits of high-speed environmentally friendly trains begin to look more like those of airplanes (Eno Center for Transportation & ICF International, 2016). These developments lead to changes in **skills requirements**, also to ensure a safe interaction between humans and their assisting technology. As explained by Eno Center for Transportation & ICF International (2016) the implications of new technologies and models of transportation service delivery are broad and are likely to transform the way people and goods move over the coming decades. Fully automated metro/subway systems, for example, are already in service, such as in the United Kingdom (UK), Germany and Japan, China, Singapore and the US (Wavestone, 2017; Wang, 2016; UITP, 2014). Fully automated cars are also operational and under development (see Box 2) as well as currently sold in North America (US and Canada), Europe, China and Australia. In addition, there is also development of sustainable aviation alternative fuels in some countries (see Box 3).

[6] **North Asia** selected members are China, Chinese Taipei, Hong Kong, Mongolia, and Emerging Asia.
[7] **Asia-Pacific** selected members are India, Japan, Indonesia, Korea, Australia, Thailand and Malaysia.

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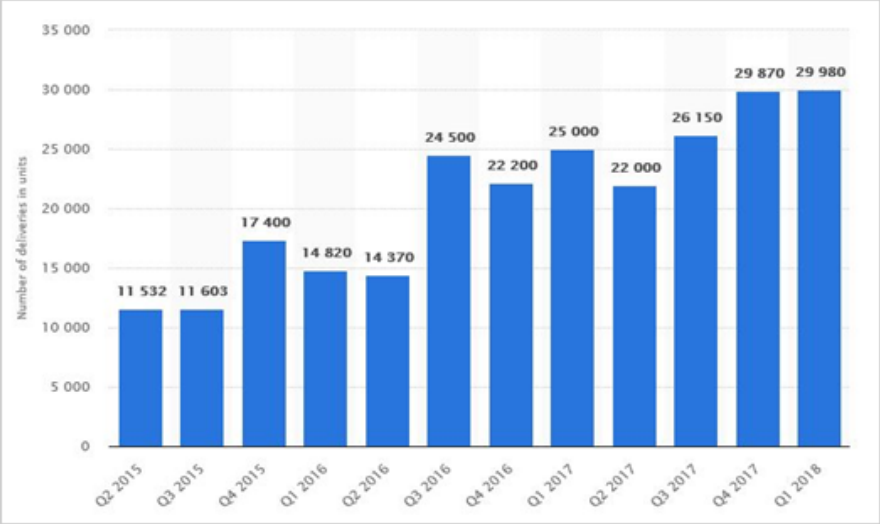
BOX 2: ROAD TRANSPORT: ELECTRIC MOTOR VEHICLES - MOVING TOWARDS A ZERO-EMISSION FUTURE

Tesla, Inc. is an automotive company founded in 2003, Fremont, California (US). It builds not only all-electric vehicles (light vehicles) but also infinitely scalable clean energy generation and storage products.

- The company's Model S was the world's best-selling plug-in electric car in 2015 and 2016.
- As of 2016, Tesla's model range includes the Tesla Model S, *Tesla Model X*, *Tesla Model 3* and *Tesla Roadster*.
- Tesla's production plan is set to increase to a rate of 500 000 vehicles a year by 2018.

Number of Tesla vehicles delivered worldwide from 2nd quarter 2015 to 1st quarter 2018 (in units)

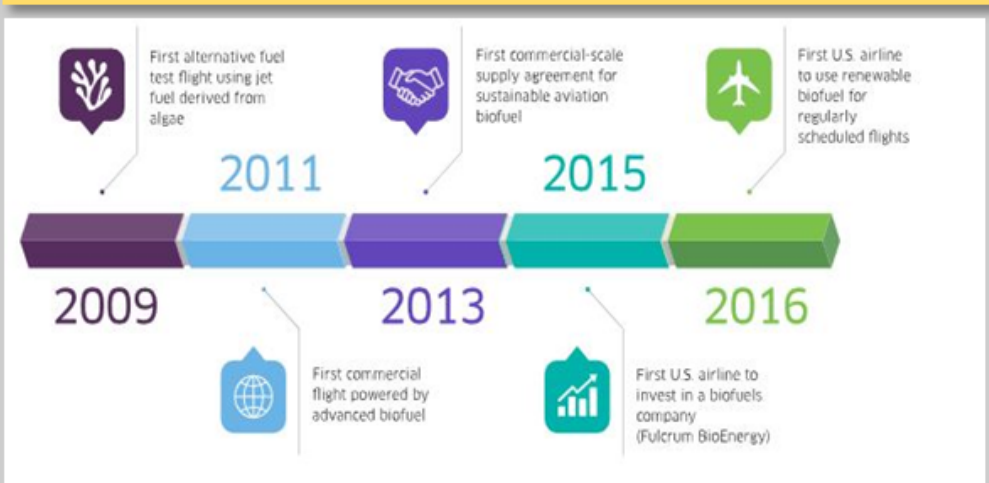


Source: Statista 2018

BOX 3: AIR TRANSPORT: SUSTAINABLE BIOFUEL AVIATION

United Airlines, Inc. (US) is one of the few companies in the air transport that has launched a green initiative **Eco-Skies** which uses biofuel (algae-based) to help power flights running between Los Angeles and San Francisco.

- It is the first American airline to use renewable fuel for regular commercial operations, and the occasion is part of a bigger movement when it comes to clean transportation in the country.
- The renewable fuel used to power planes come from AltAir Fuels, which is using the facility to produce both renewable jet fuel and diesel fuel using a technology developed by Honeywell UOP, a major supplier and technology licenser in the petroleum industry.
- The company also plans to expand to all flights operating out of Los Angeles.



United Airlines (2018)

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CHALLENGES WITHIN THE SECTOR

Transportation is growing in significance and changing in the face of challenges and drivers of change. Irrespective of the scale and the mode, there are several common issues and challenges in transport geography. The following highlights some of these key issues and challenges on an international scale.

Congestion

The issue of congestion is likely to remain as one of the ongoing issues in transportation because there are unprecedented demands for transportation being generated by a global economy that is ever more dependent upon the transport sector. The causes of congestion are well understood, even if the solutions are not. Congestion occurs across modes and locations and arises from various causes. According to Rodrigue (2017), most important is when **demand for mobility exceeds the capacity** to support it.

The expected growth of the demand is likely to have major impacts on the nature and form of the future transport sector. Road transport is likely to continue to be the dominant mode of transport. A look at recent international statistics confirm this. In the developed world as the EU, automobiles and trucks already dominate the market, and the spatial patterns of people, industries and services are interdependent to the demands of these modes (European Parliament, 2015). As pointed out by Rodrigue (2017) space extensive patterns are pushing the traffic congestion ever further out and makes it very difficult for other higher capacity modes to compete. Additionally, the demand for mobility is growing as a result of the rapid industrialisation in larger developing economies such as China and India. According to Fatima and Kumar (2014) and Ma, Liang, Gao, Sun and Li (2012), there too, a modal shift is occurring in favour of road transport. Therefore, it seems unlikely that the importance of Road Passenger and freight transport will diminish in the near future.

Congestion is not limited to internal urban-generated traffic as international trade, both in terms of value and tonnage, is also likely to continue to be dominated by Maritime and air transports. In Maritime transport, this has led to a concentration of traffic in a relatively small number of hubs. For example, Rodrigue (2017) reports that about **20 largest container ports**, especially in East Asia, handled more than 49% of global traffic in 2012 (see Figure 5-1). In air transport, global air freight activity was clustered around East Asia, the American Midwest and Western Europe in 2010 (see Figure 5-2). Accordingly, there are expectations that congestion related to trade flows will remain an issue in the future.

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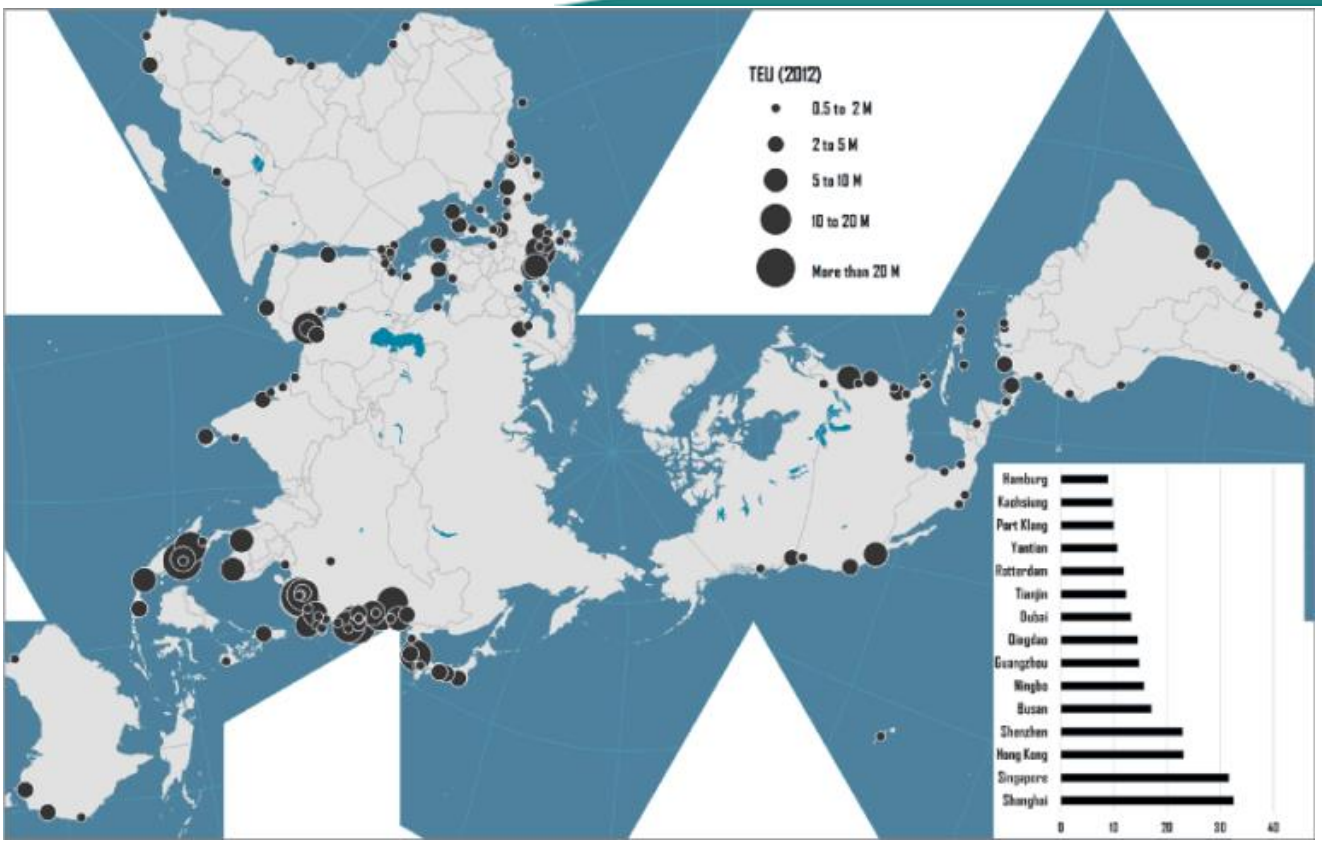

Figure 5-1: World's Major Container Port Traffic (20-foot-equivalent/TEU units) in 2012

Source: Rodrigue (2017)

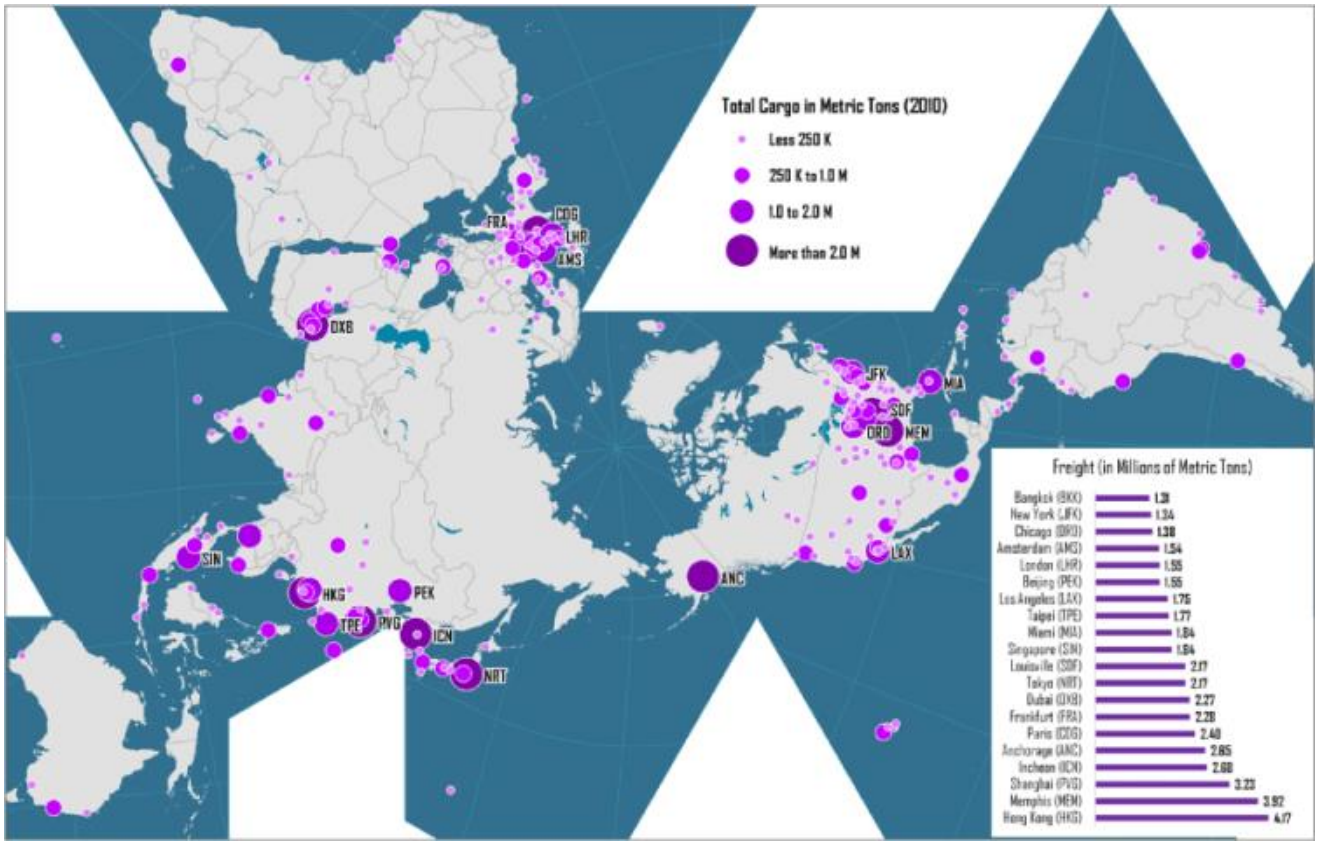

Figure 5-2: Freight Traffic at the World's Largest Airports in 2010

Source: Rodrigue (2017)

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Infrastructure

Regardless of the specific solutions to congestion that are or will be considered, increasing demand is placing unprecedented requests for investments on global transport infrastructures. Transport infrastructure investment is projected to increase at an average annual rate of about 5% worldwide between 2014 and 2025 (PwC, 2015). Sub-Saharan Africa is expected to have the fastest average annual growth rate of over 11%, while Asia-Pacific will remain by far the largest transport infrastructure market. Investment in sea ports is predicted to grow the fastest at 5,8% on average per year over the forecast period, while airport investments are expected to slow down to an annual growth rate of 2,6%. Roads will likely remain the biggest area of investment, especially for growth markets in developing countries. Railways, by contrast, are forecast to see relatively strong growth in developed countries with mature transport markets like Western Europe where there is a growing opinion in favour of public transport – and particularly in the UK and Spain where high-speed networks are expected to undergo further development.

A major question, however, confronting all countries around the world is how to finance the construction and maintenance of transport infrastructures. According to Rodrigue (2017), governments have traditionally been the primary source of funding in the transport sector, but the costs of keeping pace with the growth in demand are making it difficult for even the developed countries to provide public funding on the scale required to meet expectations about the mobility of passengers and freight. Therefore, understanding how much investment to make in the transport system, and how to fund that investment, is a major ongoing challenge for the government and for the future.

5.2 FUTURE OUTLOOK

Future transportation systems will likely be shaped by the same forces than in the past, but it remains to be seen which technologies will prevail and what will be their impacts on the structure. As noted, transport infrastructure investment is projected to increase at an average annual rate of about 5% worldwide over the period of 2014 to 2025. Railways, roads and ports (sea and air) are forecast to see relatively strong growth in advanced and emerging economies with mature transport markets.

OPPORTUNITIES AND CHALLENGES THE FOURTH INDUSTRIAL REVOLUTION POSED FOR THE TRANSPORT SECTOR

Many new and more complex push factors have arisen in recent years. Some developed countries like the US and Japan are already moving towards the **Fourth Industrial Revolution (4IR)**[8] in their transportation plans that address contemporary issues such as advanced robotics, networks of autonomous vehicles (AVs) and artificial intelligence. However, there are also fears that the digital automation journey will result in significant job losses, especially manual low- and medium-skilled jobs, performed by humans in cities. The battle over **Uber** and **Waymo** (subsidiary of Google) driverless cars, for instance, has really been a debate about the future of humanity and passenger transportation. In some areas in the US such as Arizona, Waymo has been operating its autonomous (hybrid) minivans on public roads and set to expand its market (Waymo, 2018; Phoenix Business Journal, 2018). Uber is also set to change its business model and plans to buy 24,000 autonomous Volvo suburban/sport utility vehicles (SUVs) in the race for a driverless future. However, there is also growing concern with AVs regarding traffic safety.

Road transport is not the only sub-sector set to change. It is indicated that robotic process automation in the airline industry is expected to have a significant impact on transportation and logistics by 2035 (IATA,

[8] Fourth Industrial Revolution (4IR) is a new era that builds and extends the impact of digitisation in new and unanticipated ways, i.e. embracing mobile connectivity, artificial intelligence, Big Data, the Internet of Things (IoT), next-generation robotics, additive manufacturing (three-dimensional printing), blockchain software, wearable technologies and genetic engineering.

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2017). Maritime freight transport is already shifting from manual operations to automated systems. For example, the China State Shipbuilding Corporation (CSSC) in 2017 developed and built the **world's first smart ship** named "Great Intelligence" (GI); and formed a strategic alliance with the China Classification Society (CCS) and System Engineering Research Institute (SERI), among other members, that aims to speed up technological advancement and industrial development of the smart ships consumption (PTI, 2017). GI features an intelligent navigation system which enables it to optimise shipping routes in order to reach the destination in shortest time and with minimal fuel consumption. It is stated that GI will be used to transport coal and salt between China, Australia and Southeast Asia.

With today's fierce competition, shipping companies, vessels and terminal hubs are all becoming larger, while trade patterns in the shipping industry are experiencing greater fluctuations. According to Dr Oscar Pernia, Vice-President of Terminal Operational Innovation at Navis (cited in The Maritime Executive, 2017), this demands an incredibly flexible workforce and, more often than not, inhumanely long shifts. In addition, it has become increasingly difficult to find skilled and motivated workers. Pernia also states that automation:

- improves safety, i.e., better safety reduces the number of lost working hours, equipment damage costs and insurance premiums; and
- increases environmental sustainability, i.e. saving energy by optimising the performance of the machine, as well optimising the entire machine fleet to operate according to contextual situation.

Therefore, with the rise of automation many of these will cease to be an issue.

By understanding the change drivers that may influence the sector this means new jobs are likely to be created in industrial automation space that require and build a better educated, highly skilled workforce. Particularly, Controls Systems Engineering, Automation Systems Engineering and Manufacturing Automation Engineering, among others, are anticipated skills required.

DEVELOPING COUNTRY CONTEXT

Indeed, there is growing interest in the 4IR around the world, but in some parts, this is not the case. Currently, developing countries (e.g. South Africa) are underprepared for 4IR in transportation since their weaknesses include rising costs of production, relatively low productivity levels, lack of highly skilled labour and uncertainty about government policy (Campbell, 2017). However, plans on addressing climate change are underway. As transportation is a significant contributor to South Africa's GHG emissions, the TETA Chief Executive Officer Maphefo Anno-Frempong states that:

> "to achieve transport modernisation, South Africa will have to drastically adapt and begin to explore modal shifts from private transport to public transport, shifting freight transport from road to Rail, switching to cleaner fuels and adopting new technologies such as electric vehicles while making our cities and towns friendlier places for cyclists and pedestrians. Looking at our urban landscape, the congestion of traffic in our roads and the greater demand for integrated solutions to transportation, it is clear that more opportunities for skills development and training need to be explored" (TETA, 2017a).

Employment across the sector is expected to grow in the next years. The following diagram gives a summative view of the new green skills and the elements of such a skill.

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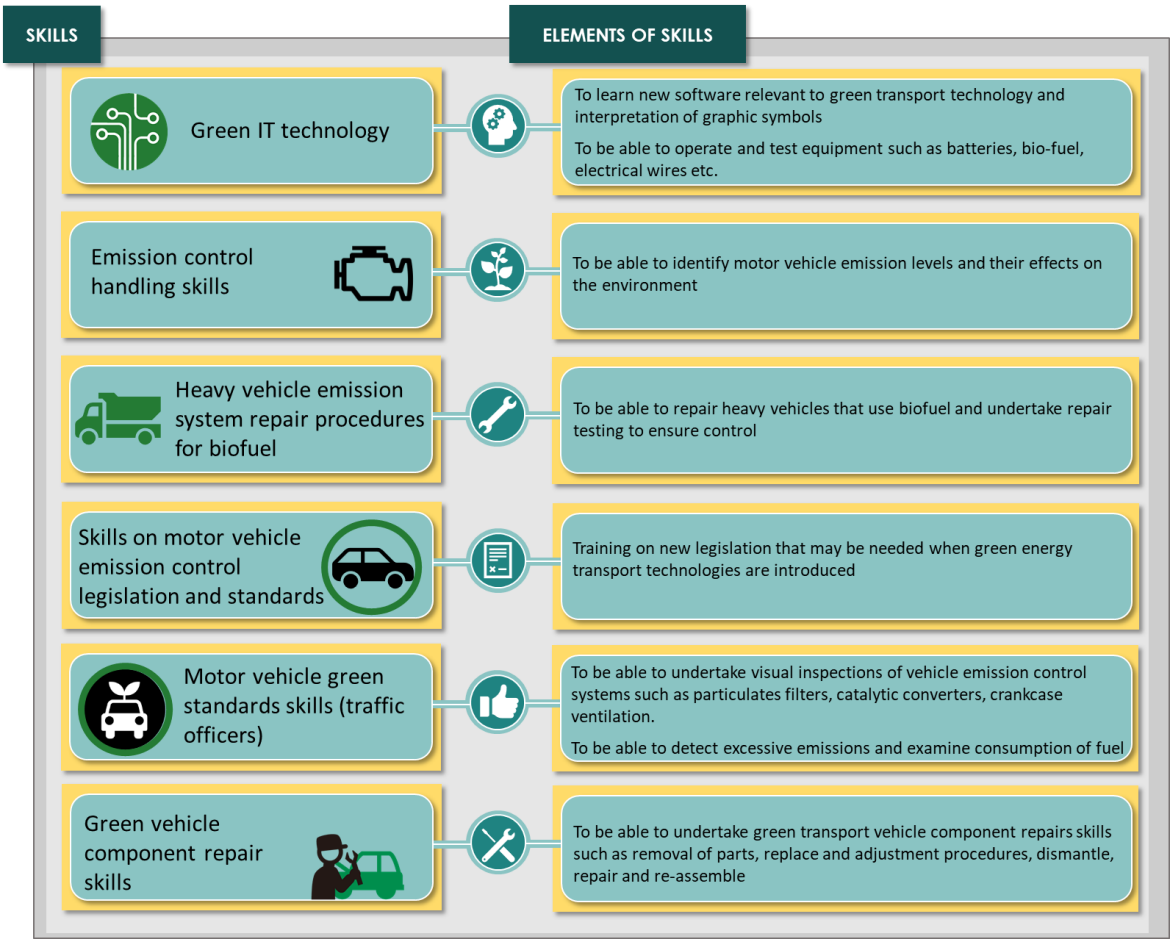

Figure 5-3: new green skills

Source: TETA (2017a)

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6. THE SOUTH AFRICAN TRANSPORT SECTOR

The transport and storage sector in South Africa are one of the most important sectors for both the national economy and employment creation. This subsection informs critical inter-relationships between the transport and storage sector and economic growth in relation to skills development by TETA to enable integrated and effectively aligned skills development strategies and programmes.

6.1 NATIONAL OVERVIEW

The Transport sector facilitates the transportation of goods and people from one place to another. This happens by means of four main modes of transport, namely, land, air, sea and inter- or multi-modal. The transport sector makes use of intensive infrastructure and is an important component of development and the economy. The mobility of people, goods and information is increasingly being associated with the creation and sustainability of economic opportunities in South Africa and across the world. Efficient transport systems are therefore crucial to growing an economy, creating access to markets, investments and employment (Department of Transport APP, 2017).

Organisationally, South Africa's transport sector is divided into eight Chambers or sub-sectors (as discussed under ***Section 3.1***) according to the four modes of transport, these are represented as follows:

- **Land**
  - Rail
  - Road (Road Freight, Road Passenger and Taxi)
- **Air**
- **Water/Sea**
- **Inter or Multi-modal**
  - Forwarding & Clearing
  - Freight handling

The South African Revenue Services (SARS) have on record 18 382 active businesses in the transport sector. The percentage distribution of these businesses across the eight sub-sectors are not evenly distributed. Road Passenger and Road Freight polarise the market with 45% and 29% respectively. Forwarding & Clearing holds 7% of the market in terms of number of companies registered, Maritime 6%, Freight Handling 5%. The Taxi and Rail sub-sectors have the lowest distribution at 2% and 1%, respectively. The share of businesses in the Transport market does not however reflect on the revenue contribution of each sub-sector to the economy, nor does it speak to number of people employed in each sub-sector (TETA SSP, 2018a).

In order to understand the transport sector's contribution with regards to the economy, the following sections give a broad overview of the macro-economic components of the sector (in particular, GVA contribution and employment).

Figure 6-1 and Figure 6-2 below provides a broad overview of the transport sector with regards to its GVA share and employment contribution. This is followed by a comprehensive analysis of the transport sector, sub-sectors and activities. As discussed at length in section 3.3, the analysis is done in accordance to the lowest level of data available; i.e. 'land transport, transport via pipelines', 'air transport', 'water transport' and 'auxiliary transport'. Where possible, data is presented in greater detail to paint a greater picture of the transport sector and the distinctions within a sub-sector.

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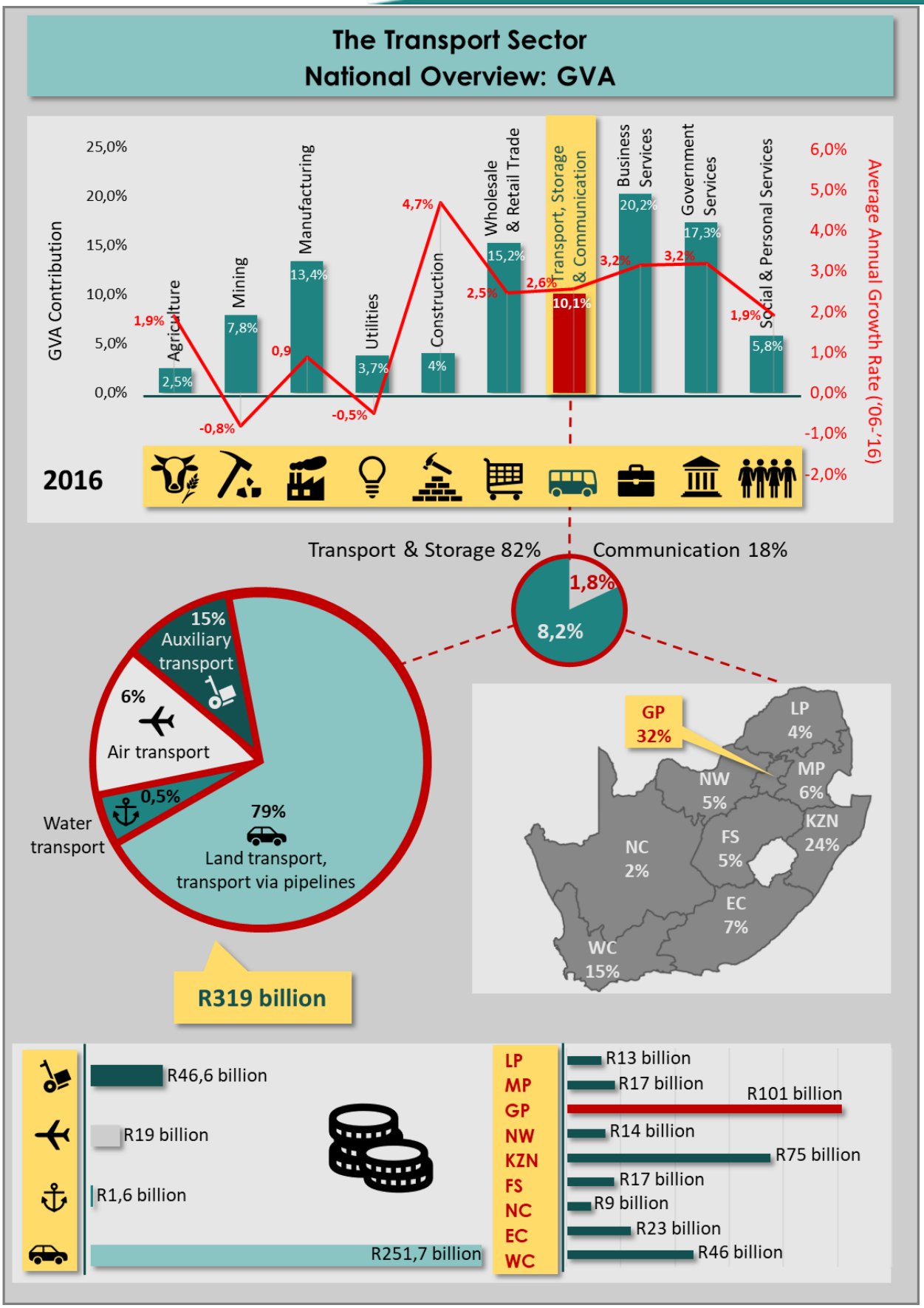

Figure 6-1: National overview of the Transport Sector: GVA

Source: Quantec 2018

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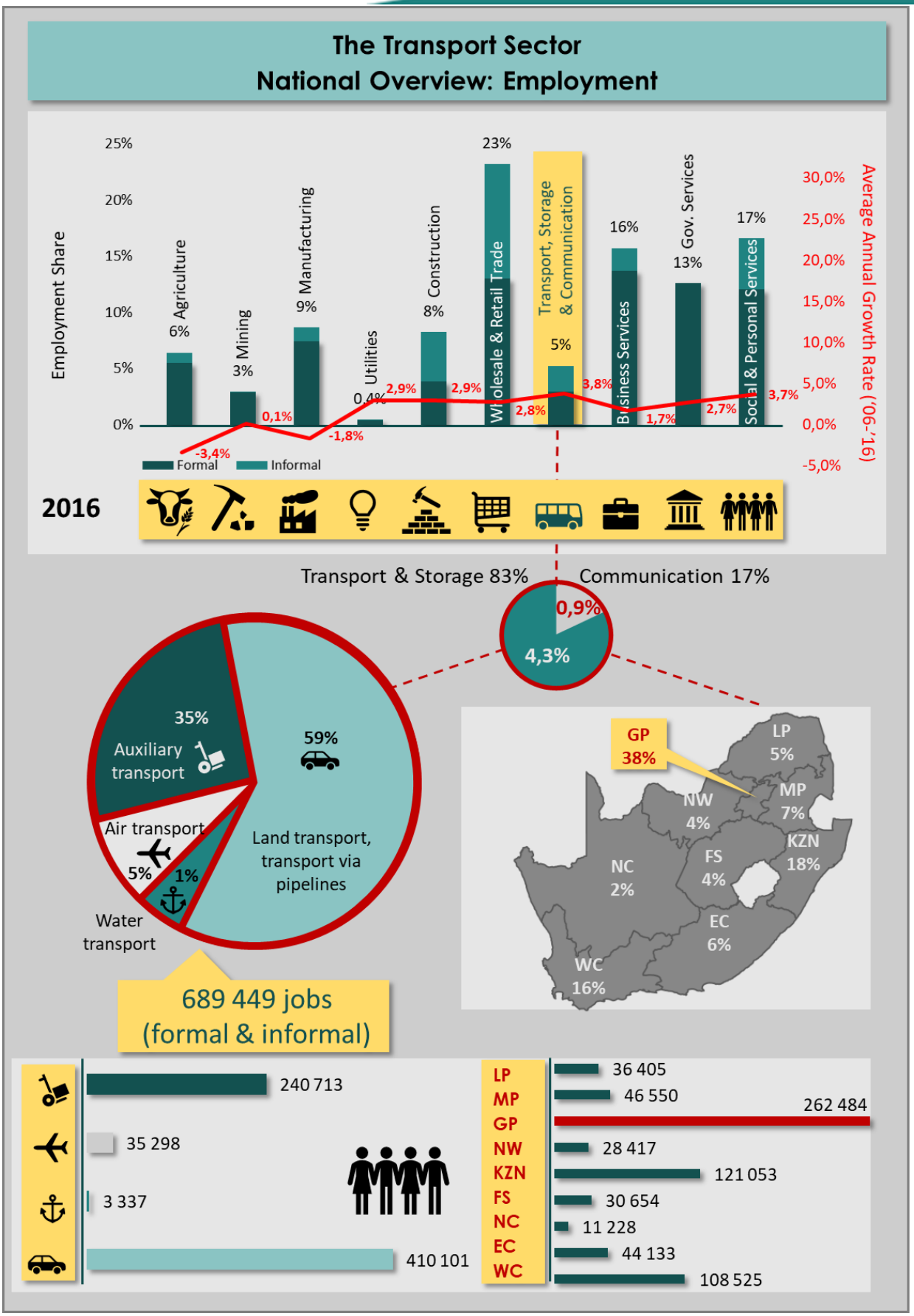

Figure 6-2: National overview of the Transport Sector: Employment

Source: Quantec 2018

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6.2.1 ECONOMIC OVERVIEW

In order to present a comprehensive picture of the economic role of the transport sector on a national and provincial scale, secondary data from various sources were analysed to determine the Gross Value Added (GVA) and employment contribution of the sector, as well as to determine the prominence of the provinces with regards to contribution to the transport sector.

6.2.1.1 GVA CONTRIBUTION

The transport (including storage) sector is one of the most important sectors for the national economy, and its importance cannot be overstated. According to GDP data for the fourth quarter of 2017, as reported by Stats SA, the size of the sector is estimated to be approximately R 268 billion of the national GDP (StatsSA, 2018). The sector plays a crucial role in connecting other economic actors with each other and for enabling the mobility of goods and persons. Without transport and logistics equipment and services neither raw materials nor products nor employees could get to the places where they are needed, and industrial production, trade and globalisation would come to a standstill.

Table 6-1 below showcases South Africa's GVA contribution by sector, comparing 2006 and 2016 figures:

Table 6-1: South Africa's GVA contribution by Sector 2006 and 2016

Sector	2006	2016	Annual average growth rate
Agriculture, Forestry and Fishing	2,6%	2,5%	1,9%
Mining and Quarrying	8,1%	7,8%	-0,8%
Manufacturing	16,4%	13,4%	0,9%
Electricity, Gas and Water	1,9%	3,7%	-0,5%
Construction	3%	4%	4,7%
Wholesale and Retail Trade, Catering and Accommodation	14,1%	15,2%	2,5%
Transport, Storage and Communication	11,9%	10,1%	2,6%
Finance, Insurance, Real Estate and Business Services	21,2%	20,2%	3,2%
General Government	14,4%	17,3%	3,2%
Community, Social and Personal Services	6,4%	5,8%	1,9%
Total	**100%**	**100%**	**2.1%**

Source: Quantec 2018

When considering the table above, it is clear that the transport, storage and communication sector contributed 11,9% and 10,1% towards GVA in 2006 and 2016, respectively. Although the transport, storage and communication sector ranked as fifth largest contributor to the total national GVA both in 2006 and 2016, its contribution dropped approximately 1,8% over the period.

Despite the overall decline in the GVA contribution, the Transport, Storage and Communication Sector had an annual average growth rate of 2,6% between 2006 and 2016. This indicates that although the Transport, Storage and Communication Sector is growing, other sectors are growing at a faster rate. These include Construction (4.7%), Financial, Insurance, Real Estate and Business Services (3,2%) and General Government (3,2%). The economy experienced an overall positive growth rate of 2,1% per annum over the period in question.

Although the transport, storage and communication sector showed an overall larger decline compared to Community, Social and Personal Services, Mining and Quarrying and Agriculture, Forestry and Fishing it did, however, outperform these sectors in terms of its annual average growth rate over ten years.

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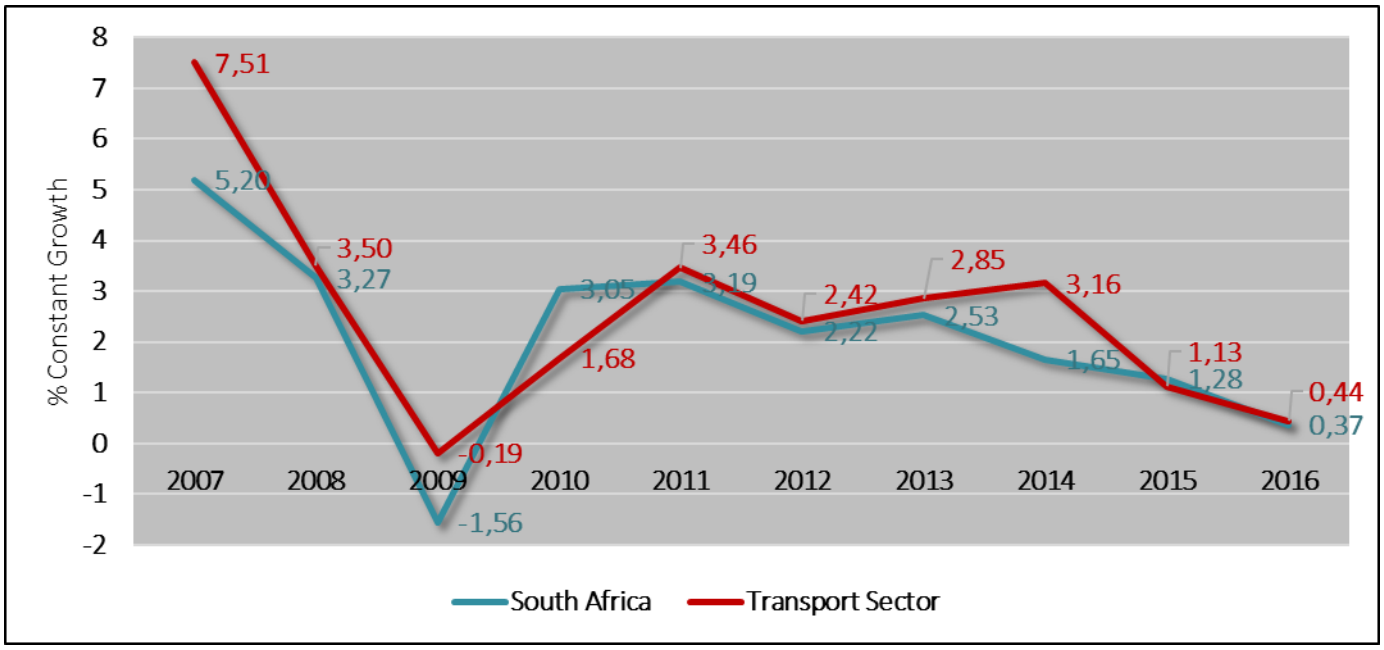
Interestingly, the average contribution for sectors towards GVA for South Africa in 2016 was approximately 10%. The transport, storage and communication sector accounted for 10,1% of the national GVA. This suggests that the transport, storage and communication sector seems to follow the same national trend. The total GVA amount for all sectors combined was approximately R3.86 trillion in 2016.

Figure 6-3 compares the transport, storage and communication sector to the rest of the South African economic growth. The transport and communication sector have been removed from the South African growth rate calculations to avoid distortion.

Figure 6-3: GVA Annual Growth Rates for Transport Sector and Other Sectors, (2010 Constant Prices) 2006 – 2016



**Note: SA graph excludes transport sector contribution amount* *Source:(Quantec, 2018)*

Based on the figure above, it is noted that, apart from 2010 and 2015, the transport, storage and communication sector experienced a higher growth rate compared to the rest of the national economy in terms of GVA. Overall, the transport sector follows the same trajectory as the national GVA in terms of annual growth.

At this point, it should be noted that the transport, storage and communication sector is divided into the transport and storage sub-sector, and the communication sub-sector. Approximately 82% of the transport, storage and communication sector comprise the transport and storage sub-sector, while 18% comprise the communication sub-sector. In real terms, this means that the transport and storage sub-sector holds approximately 8,2% of the national GVA (2016), and communication about 1,8%. This is illustrated below:

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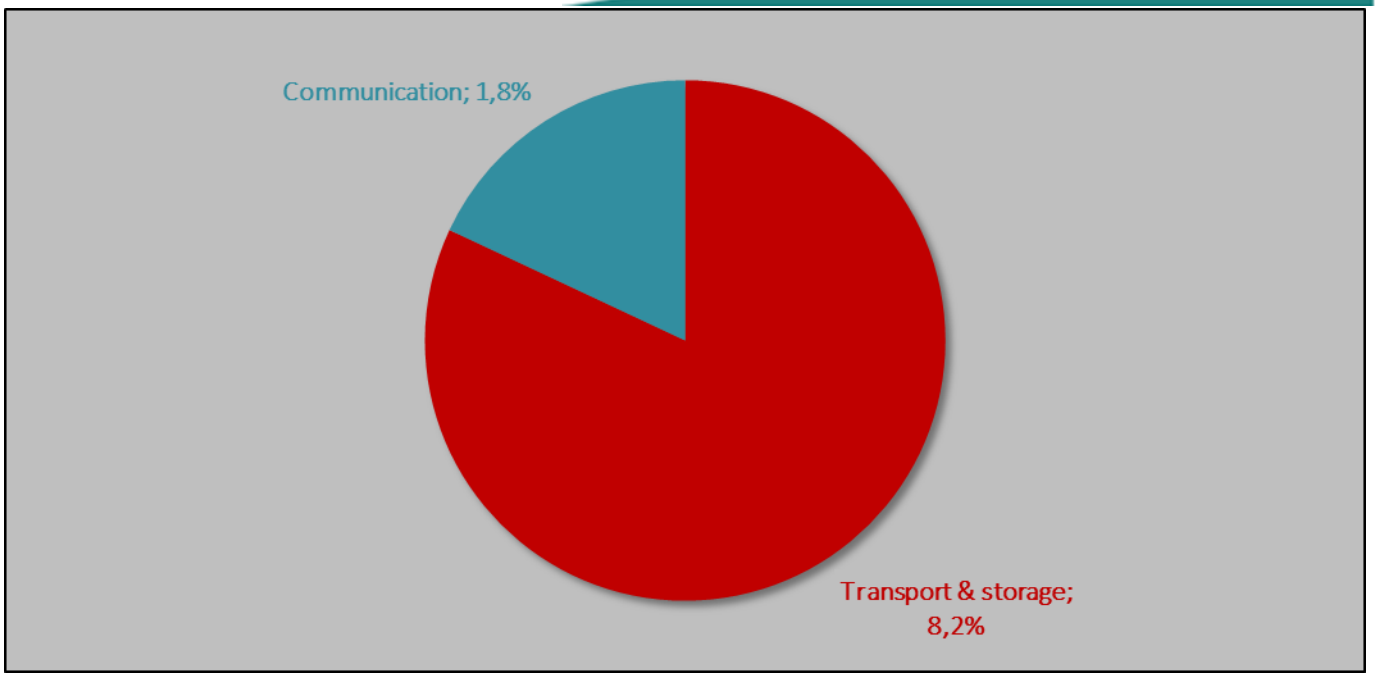

Figure 6-4: Transport, storage and communication split

Source: Quantec 2018

The transport and storage sub-sector can be broken down further into 'land transport, transport via pipelines', 'water transport', 'air transport', and 'auxiliary transport'. The share of these activities towards the transport and storage sub-sector's GVA contribution are set out in Figure 6-5 below:

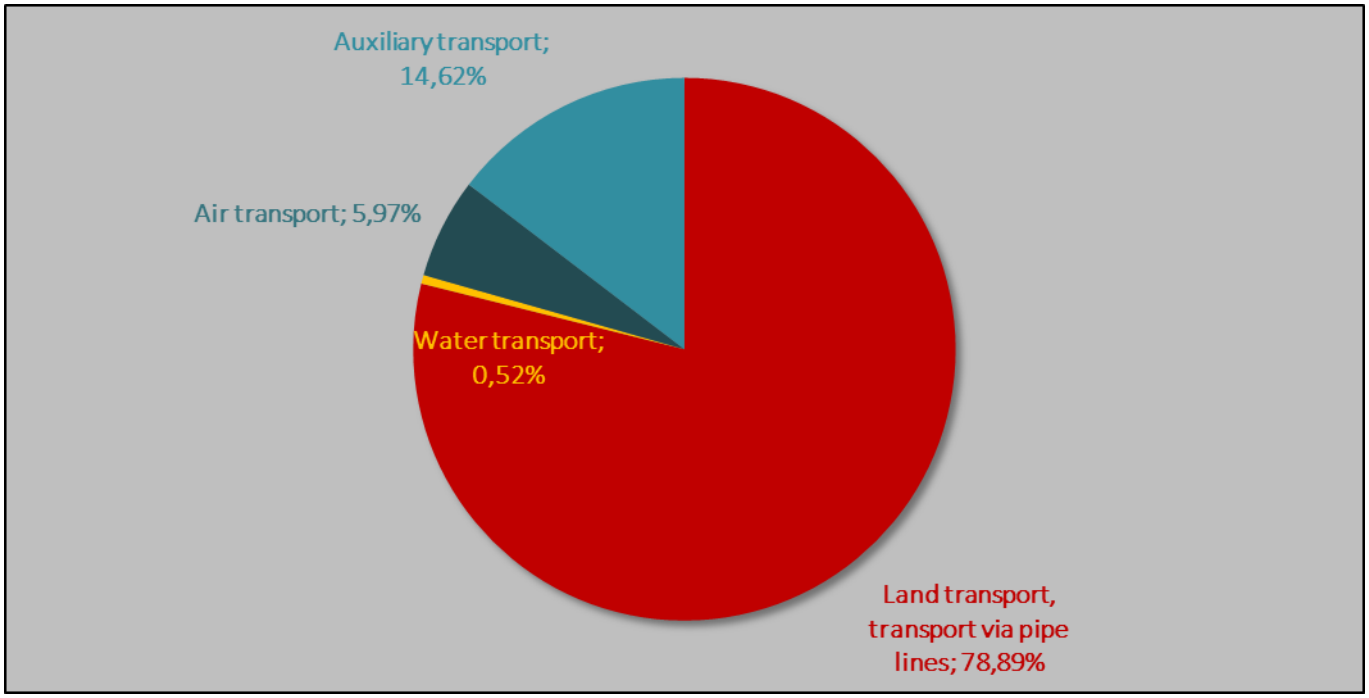

Figure 6-5: Transport & storage sub-sector split (in terms of GVA contribution)

Source: Quantec 2018

From the figure, it is clear that the sub-sector is dominated by the land transport, transport via pipelines activities, with almost 79% of the sub-sector's GVA contribution derived from these activities. Water transport activities contributes less than 1% towards the transport and storage sub-sector GVA, while

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auxiliary transport activities are the second largest contributor at just under 15%. Air transport activities contribute almost 6%.

The GVA contribution of the sub-sector activities are set out in monetary terms in Table 6-2 below. The table also gives an indication of the relative size of each sector, sub-sector and activity in relation to its national GVA share.

Table 6-2: GVA contribution in monetary terms, 2016

SECTOR	SUB-SECTORS	ACTIVITIES
10,1% National GVA share Transport, storage & Communication **R389 billion** **100% of sector**	8,2% National GVA share Transport and storage **R319 billion** **82% of sector (100% of sub-sector)**	6% National GVA share Land transport, transport via pipelines **R252 billion** **65% of sector (79% of sub-sector)**
		1% of National GVA share Auxiliary transport **R47 billion** **12% of sector (15% of sub-sector)**
		0,5% of National GVA share Air transport **R19 billion** **5% of sector (6% of sub-sector)**
		0,04% of National GVA share Water transport **R2 billion** **0,4% of sector (0,5% of sub-sector)**
	1,8% National GVA share Communication **R70 billion** **18% of sector**	

Source: Quantec 2018

To gain perspective on the historic growth of the transport and storage sub-sector, the year-on-year growth rates for the different activities within the sub-sector is examined. This is illustrated in Figure 6-6 below:

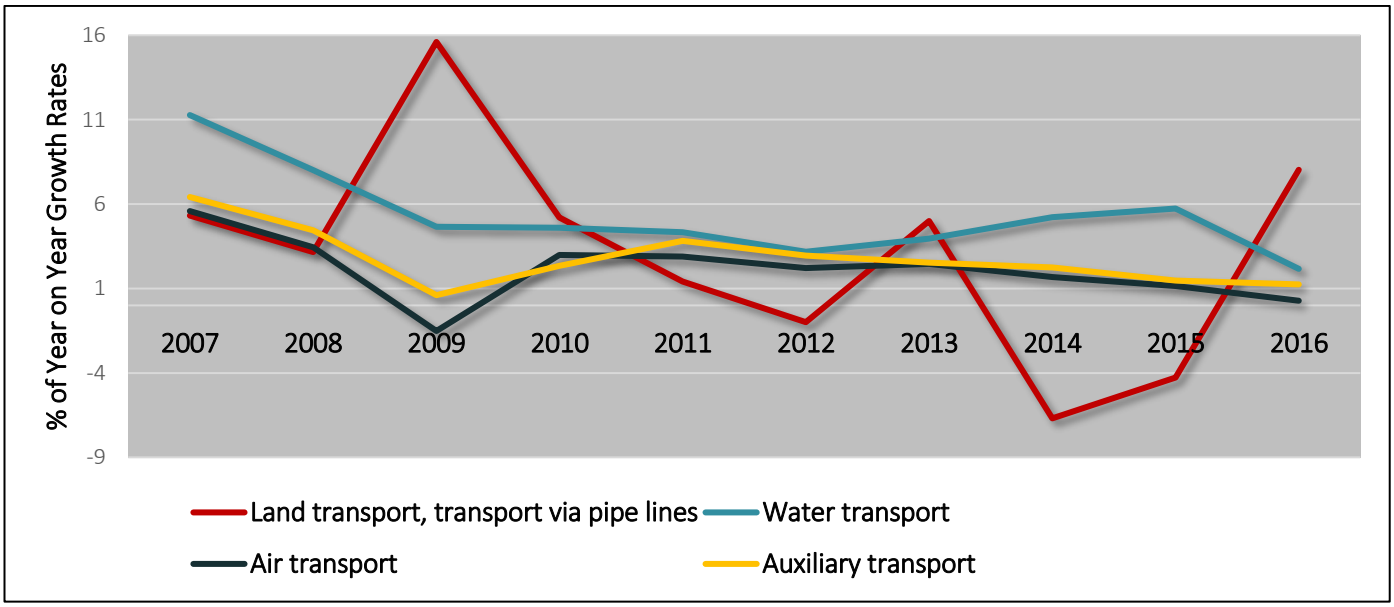

Figure 6-6: Year-on-Year Growth Rates of the transport & storage sub-sector activities, 2006-2016

Source: Quantec 2018

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The land transport and transport via pipe lines activities experienced the most erratic and drastic growth over the decade in question. The other three activities (i.e. water, air and auxiliary transport) are less sporadic in growth rates in comparison.

When comparing air and auxiliary transport activities, it is noticed that the two closely follow each other, always moving in the same direction. The inference can be made that these two activities are closely related with regards to external factors, while land transport, transport via pipe lines and water transport act more independent (yet cannot be exonerated from sensitivities in the market).

6.2.1.2 EMPLOYMENT

Table 6-3 below gives an overview of **formal** employment contribution per economic sector for 2006 and 2016 in South Africa and indicates the annual average employment growth rate per sector, as well as the average number of jobs lost or gained per sector per year, for the same time period.

Table 6-3: Formal employment contribution per economic sector

Sector	2006	2016	Annual average growth rate	Average number of jobs per year
Agriculture, Forestry and Fishing	10,9%	7,4%	-3%	-43 489
Mining and Quarrying	4,0%	3,9%	0%	96
Manufacturing	12,3%	10,0%	-2%	-23 705
Electricity, Gas and Water	0,4%	0,5%	2%	1 173
Construction	5,7%	5,1%	-1%	-5 085
Wholesale and Retail Trade, Catering and Accommodation	16,9%	17,5%	1%	13 479
Transport, Storage and Communication	**4,0%**	**3,9%**	**0,1%**	**496**
Finance, Insurance, Real Estate and Business Services	17,9%	18,4%	1%	13 485
General Government	13,4%	17,0%	3%	41 743
Community, Social and Personal Services	14,5%	16,2%	1%	24 144
Total	**100%**	**100%**	**0,3%**	**38 012**

Source: Quantec 2018

From the table above, it is clear that the transport, storage and communication sector held approximately 4% of the total **formal** employment for South Africa in 2006 and 2016 respectively. Although the transport sector contributes third least to employment, it holds a positive annual average employment rate of 0,1%, which translates to approximately 496 new jobs in the sector each year.

It is well known that the transport sector comprises elements of informality, particularly with regards to the Taxi industry. As such, it is deemed important to gain perspective on informal employment. Table 6-4 below gives an overview of informal employment contribution per economic sector for 2006 and 2016.

From the table, it is clear that the transport sector is more prominent with regards to its contribution towards informal employment than it is towards the formal employment, holding the fourth largest share at 9,1% in 2016. The sector furthermore showed the third largest annual average employment growth after the business services and the social services sectors. This translates into approximately 14 340 new jobs per year between 2006 and 2016.

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Table 6-4: Informal employment contribution per economic sector

Sector	2006	2016	Annual average growth rate	Average number of jobs per year
Agriculture, Forestry and Fishing	10,0%	3,6%	-3%	-6 407
Mining and Quarrying	0,1%	0,1%	9%	210
Manufacturing	12,0%	4,8%	-2%	-5 150
Electricity Gas and Water	0,1%	0,1%	10%	215
Construction	16,0%	17,2%	8%	26 092
Wholesale and Retail Trade, Catering and Accommodation	43,7%	39,7%	6%	55 457
Transport, Storage and Communication	**5,9%**	**9,1%**	**12%**	**14 340**
Finance, Insurance, Real Estate and Business Services	3,5%	7,9%	16%	11 549
General Government	0,0%	0,0%	0%	-
Community, Social and Personal Services	8,6%	17,6%	15%	26 478
Total	**100%**	**100%**	**7%**	**147 819**

Source: Quantec 2018

When adding the formal and informal employment together, the following picture of employment within the country's economy becomes evident:

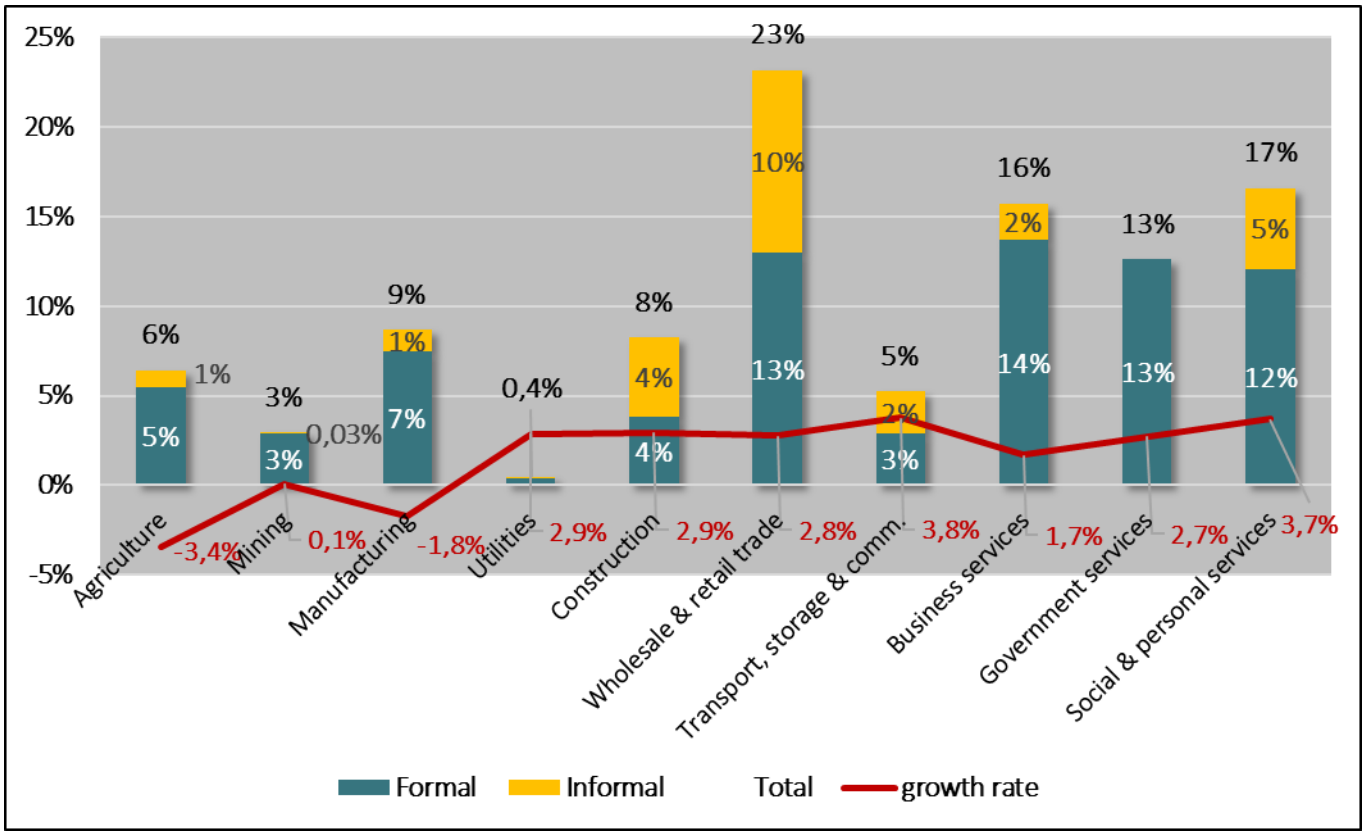

Figure 6-7: Total employment (formal and informal) per economic sector

Source: Quantec 2018

The transport, storage and communication sector (the fifth highest contributor towards the country's GVA) was only the eight biggest employers out of the ten sectors in 2016, employing approximately 5% of SA's workforce. It is worth noting that there is no linear relationship between share of GVA by sector and share of employment by sector.

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When considering the overall employment growth rate (formal and informal) for the transport, storage and communication sector in relation to the overall employment growth rate for the rest of the sectors for the country, it performs better at 3,8% compared to 1,7% for national. However, when calculating the average contribution of each of the different sectors (approximately 9,9%), the transport, storage and communication sector is underperforming with its contribution of 5,2% towards the total employment.

Figure 6-8 below compares the annual growth rate for the transport, storage and communication sector to that of the rest of the sectors between 2006 and 2016.

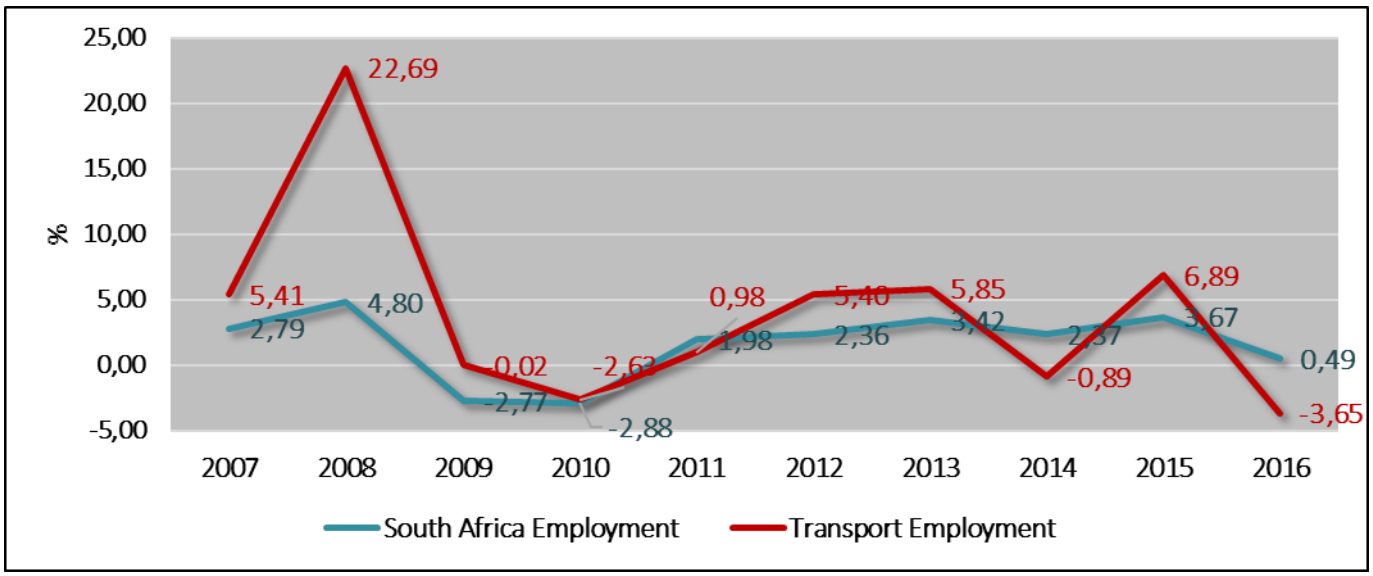

Figure 6-8: Employment Growth Rate of the Transport, Storage and Communication Sector and Rest of South Africa's Economy, 2006-2016

**Note: SA graph excludes transport sector contribution amount* *Source: Quantec 2018*

The employment growth rate for the transport, storage and communication sector appears much more erratic, when compared to the national employment growth pattern. The transport, storage and communication sector experienced a spike during 2008, with an additional 137 696 jobs in the sector reported from the previous year.

Although the transport, storage and communication sector's employment growth rate decreased drastically from 2008 to 2009, it remained above SA's employment growth rate for most of the reported period up until 2014, where it decreased while the average employment growth rate for the rest of the sectors remained steady. From 2014 to 2016 the transport, storage and communication sector follows the same general trend as the rest of the sectors, only much more amplified.

With regards to employment contribution, the transport, storage and communication sector can be split up into the transport and storage sub-sector, and the communication sub-sector. This is illustrated in Figure 6-9 below. From the figure it is clear that the transport and storage sub-sector holds approximately 83% of the total employment share (formal and informal employment), while the communication makes up approximately 17%.

This translates to 4,3% of the total national employment share (formal and informal) held by the transport and storage sub-sector and 0,9% by communication.

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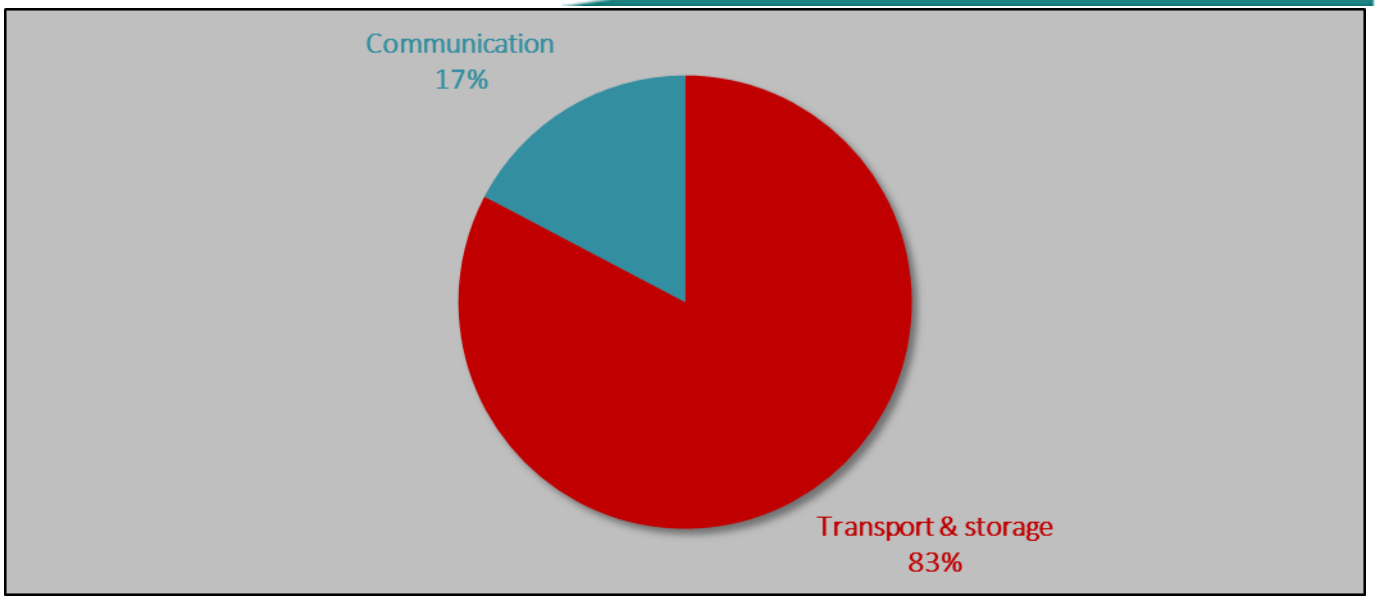

Figure 6-9: Transport & storage sub-sector and communication sub-sector employment split, 2016

Source: Quantec 2018

The total employment figures can further be broken down into formal and informal employment, as illustrated by Figure 6-10 below. From the figure it is clear that the transport and storage sub-sector comprise approximately 53% formal, and 47% informal employment. This translates to about 368 186 formal jobs and 321 263 informal jobs. Figure 6-10 furthermore illustrates the skill level split of the formal employment, which shows that 10% of the total labour force within the sub-sector are skilled, 35% are semi-skilled, and 8% are low skilled (the remaining 47% hold informal employment).

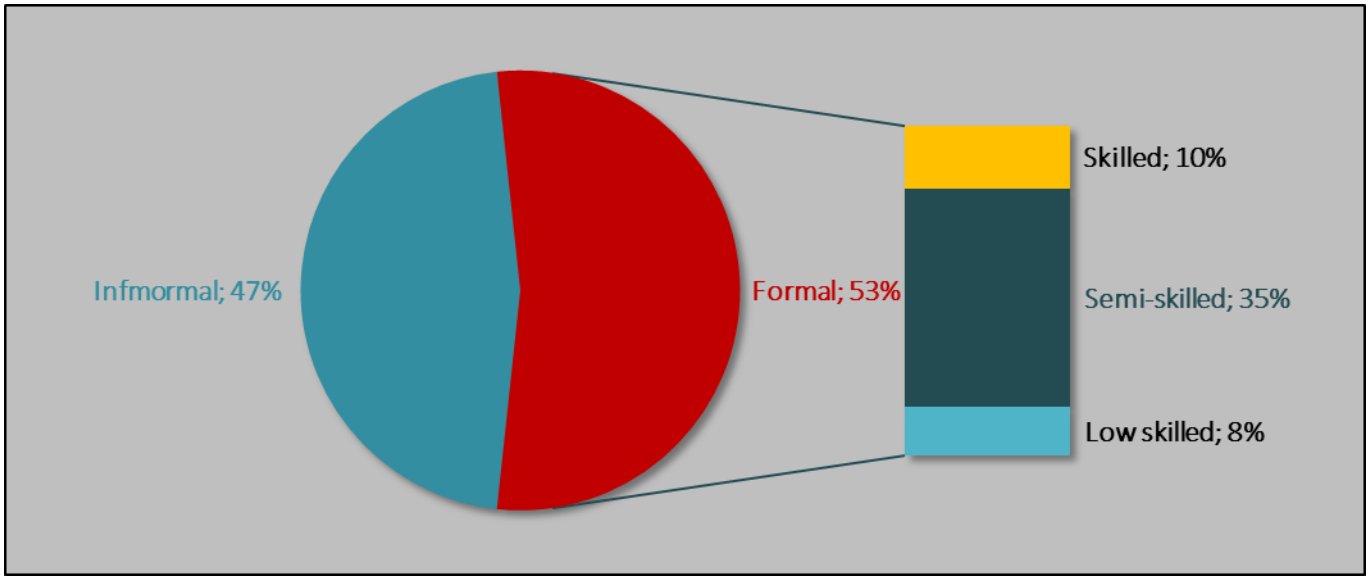

Figure 6-10: Transport & storage sub-sector formal, informal and skills level employment split, 2016

Source: Quantec 2018

The formal employment and skills level can be examined in further detail, as illustrated Figure 6-11. The figure compares 2006 and 2016 figures to understand the change in skills level across the sub-sector, and to establish the annual average growth rate for each of the three skill levels.

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The figure illustrates that the skills levels remained proportionally similar when comparing 2006 and 2016 figures.

Semi-skilled labour comprised approximately 66% of the transport and storage sector formal labour force in 2016, followed by skilled labour at 19%, and low skilled at 15%. It should be noted that semi-skilled labour showed the highest average annual growth rate between 2006 and 2016, approximately 0,3% higher than skilled labour, and 0,2% higher than low skilled labour.

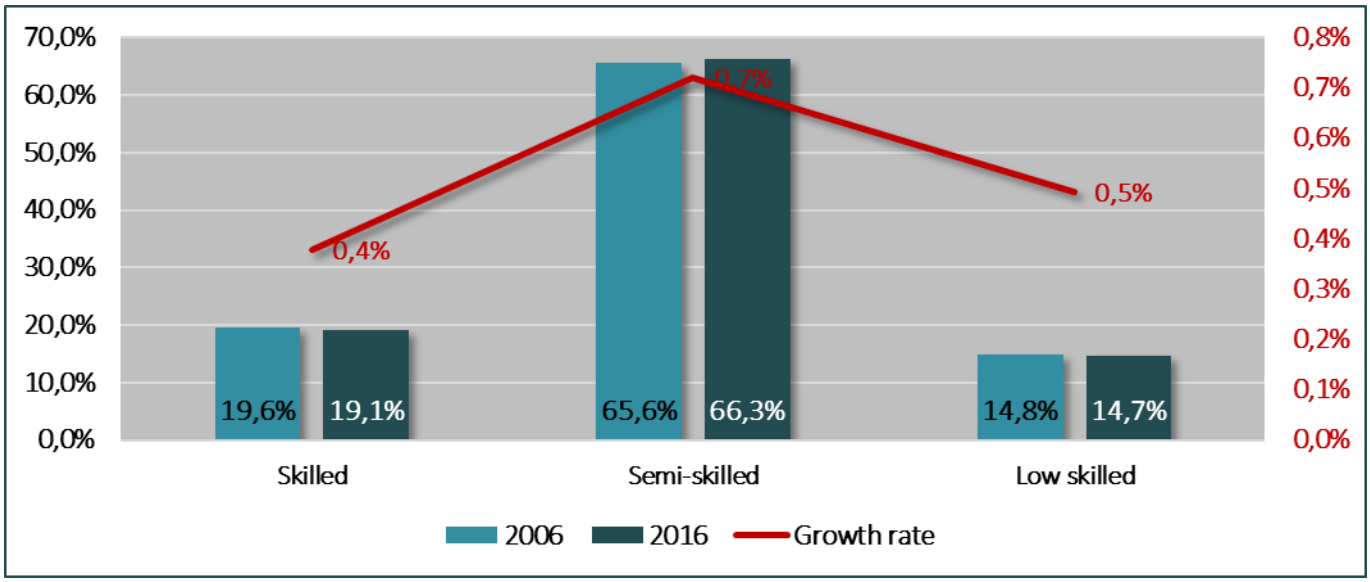

Figure 6-11: Formal employment skills level for the transport & storage sub-sector, 2006 and 2016

Source: Quantec 2018; UE calculations

The transport and storage sub-sector can further be broken down into 'land transport, transport via pipelines', 'air transport', 'water transport' and 'auxiliary transport'. The employment share for the sub-sector is illustrated according to these activities are illustrated in Figure 6-12 below:

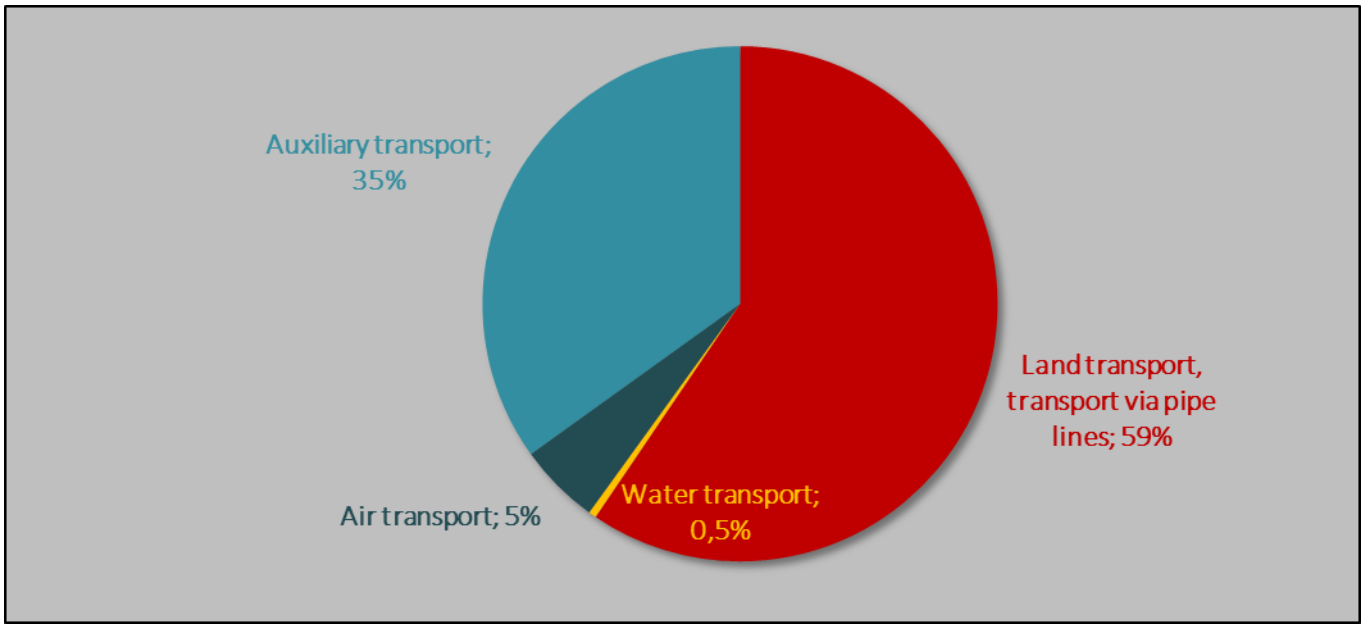

Figure 6-12: Transport & storage employment split, 2016

Source: Quantec 2018

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The biggest employer in the transport and storage sub-sector is 'land transport, transport via pipeline' employing approximately 35% of the labour force in this sub-sector. In 2016, 35% of the sub-sector translated to just more than 410 000 employees (this includes formal and informal employment figures). The smallest employer is 'water transport', employing less than 1% of the workforce, which translated to less than 3 500 employees in 2016.

6.2.1.3 TRANSPORT BUSINESS PROFILE

In order to gain perspective on the businesses that operate within the Transport Sector, surveys were distributed to transport businesses (for more detail on data collection, sample sizes and confidence levels, please refer to ***Section 2 Research Approach***

The results provide insights into the following aspects of transport businesses:

- Business size
- Business activities/classification
- Geographic distribution
- Employment distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

Business size in this context is based on the number of employees. Small businesses employ between 1 and 49 people, medium businesses employ between 50 and 149 people, while large businesses employ 150 or more people.

Of those businesses that took part in the survey, approximately 35% are small, 32% are medium, and 33% large. This is illustrated in the figure below:

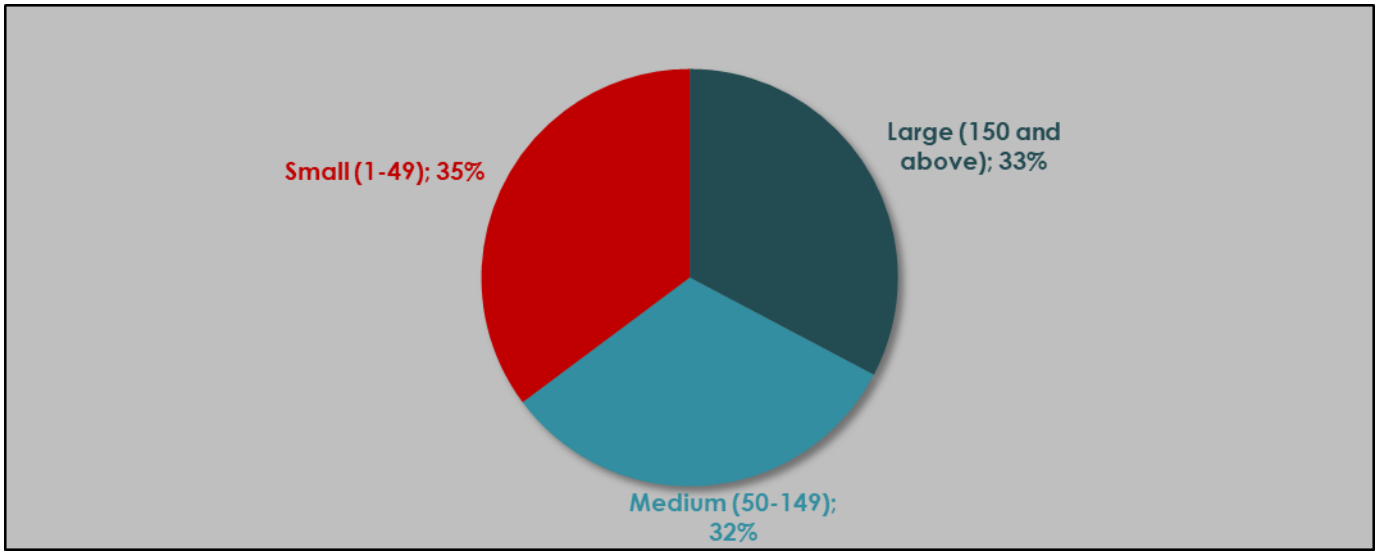

Figure 6-13: Business size classification of responding businesses

Source: UE 2018

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BUSINESS ACTIVITIES/CLASSIFICATION

The responding businesses were asked to classify themselves according to their business activity and corresponding Chamber. The results are illustrated in the figure below:

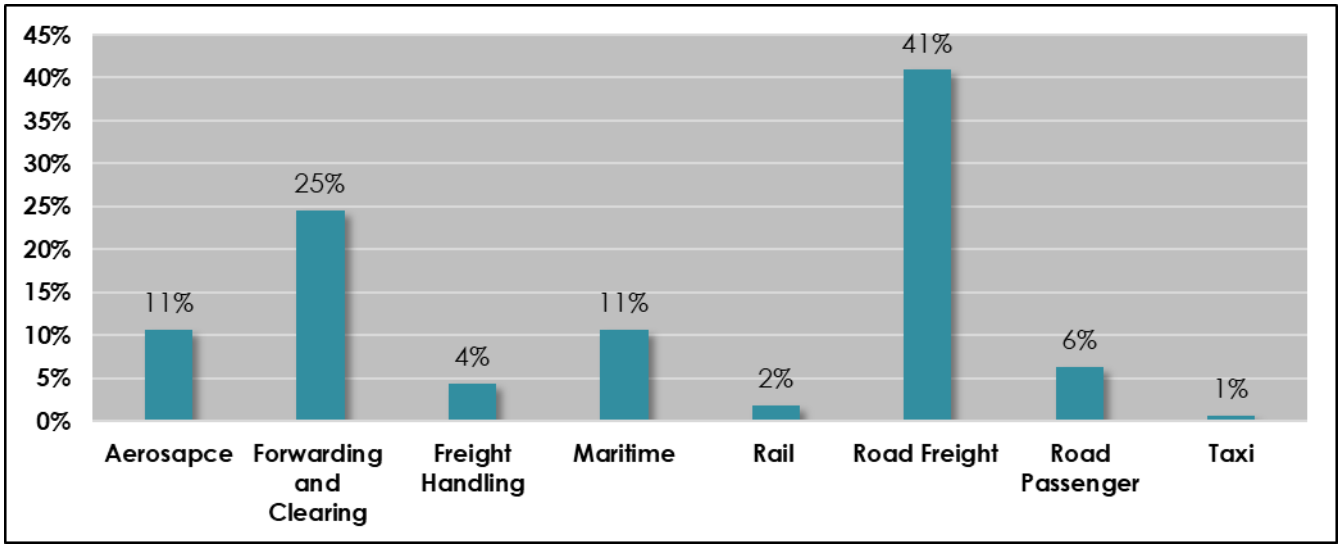

Figure 6-14: Business distribution by Chamber Classification

Source: UE 2018

From the figure, it is clear that the majority of responding businesses fall within the Road Freight Chamber (41%), followed by the Forwarding & Clearing Chamber (25%). The Chambers with the least responding businesses are the Rail Chamber (2%) and the Taxi Chamber (1%).

It should be noted that Figure 6-14 does not represent the employment distribution within the respective Chambers, but the distribution of businesses that took part in the questionnaire.

GEOGRAPHIC DISTRIBUTION

Figure 6-15 indicates the head office location of responding businesses. The greatest concentration of transport businesses is located in Gauteng, with more than half of responding businesses (51%) indicating that their head office is located in the Gauteng Province. This is followed by 16% of businesses with head offices in KwaZulu-Natal and 14% of businesses with head offices in the Western Cape.

When comparing the above stated results with GVA origination in South Africa, the same trend is observed. The greatest concentration of GVA for transport businesses is derived in Gauteng, followed by KwaZulu-Natal and the Western Cape (please refer to Figure 6-15 for greater details and references). The geographic distribution of the responding businesses thus validates the National statistics.

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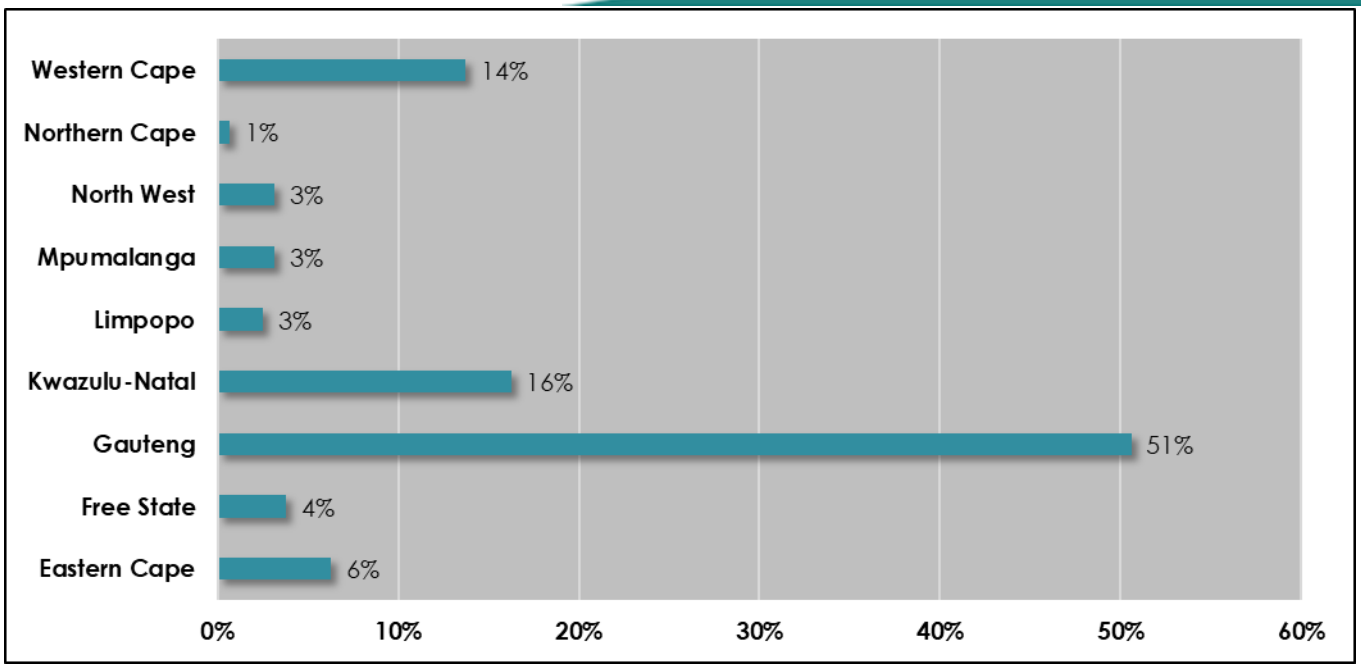

Figure 6-15: Geographic distribution (head office location)

Source: UE 2018

Responding businesses were asked to indicate if they had other branches in addition to the head office/main branch. These results are contained in the table below:

Table 6-5: Head offices with more than one branch (in addition to head office/main branch)

Head office location	Percentage of businesses with more than one branch (in addition to the head office)
Eastern Cape	3%
Free State	1%
Gauteng	12%
Kwazulu-Natal	7%
Limpopo	0%
Mpumalanga	2%
North West	1%
Northern Cape	1%
Western Cape	3%
Total	**31%**

Source: UE 2018

The results show that about 31% of responding businesses had more than one branch. The majority of transport businesses with multiple branches have head offices in Gauteng, followed by KwaZulu-Natal and the Western Cape and Eastern Cape.

The following table illustrates the distribution of branches of responding businesses. Approximately 51% of all businesses have a branch (or branches) in only one province, followed by 14% with branches in two provinces and 16% of businesses with branches in three provinces. Approximately 13% of businesses have branches in four provinces while 6% have branches in five or more provinces.

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Table 6-6: Distribution of branches

Distribution of branches	Percentage of businesses
Branch/es in 1 province	51%
Branches in 2 provinces	14%
Branches in 3 provinces	16%
Branches in 4 provinces	13%
Branches in 5 branches or more	6%
Total	**100%**

Source: UE 2018

The results contained in Table 6-5 and Table 6-6 further substantiate National trends observed. Most businesses are concentrated in one province, with most of the responding businesses with more than one branch having their head office in Gauteng.

EMPLOYMENT DISTRIBUTION

When analysing the number of people employed by each of the responding businesses, it was found that large businesses employ 76% of the total number of employees, followed by medium businesses employing 18% and small businesses employing only 6%. These results are illustrated in the figure below:

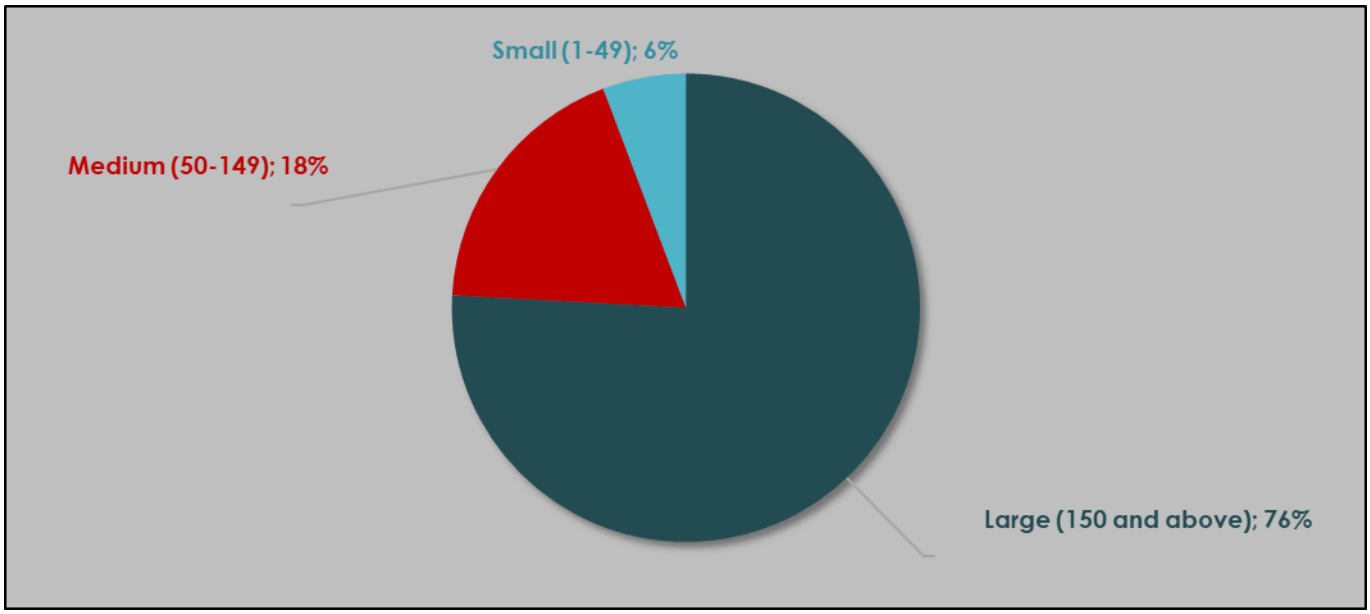

Figure 6-16: Employment distribution by business size[9]

Source: UE 2018

Figure 6-17 below reveals the employment distribution by head office location for responding businesses. Businesses with head offices located in Gauteng employ approximately 72% of employees. This is followed by head offices in KwaZulu-Natal and the Western Cape which employ approximately 9% of employees, respectively. Businesses with head offices in the Northern Cape employ the least at 0,6% of employees.

[9] This calculation was done by removing an outlier figure of 60 000

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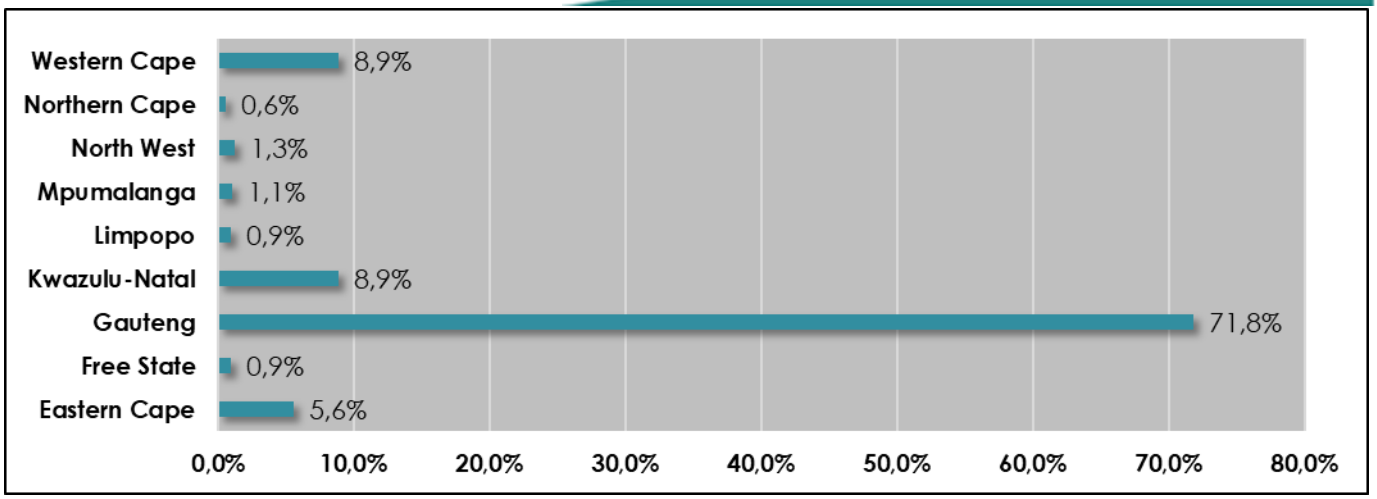

Figure 6-17: Employment distribution by head office location[10]

Source: UE 2018

Figure 6-17 follows the same trend as the National employment trend. Although it should be noted that the employment trends do not necessarily take head office location into consideration, it still confirms that employment is concentrated in Gauteng, KwaZulu-Natal and the Western Cape.

EMPLOYMENT PROFILE

The table below reveals the average number of employees for responding businesses, by company size.

On average, large businesses have approximately 486 employees, medium businesses have 94 employees and small businesses have 24 employees. Provincially, Gauteng has the highest average employees (228) and the Free State has the lowest (47).

Table 6-7: Average number of employees by company size[11]

Head office location	Large	Medium	Small	Total
Eastern Cape	447	107	30	160
Free State	-	92	32	47
Gauteng	567	95	22	228
Kwazulu-Natal	214	95	24	94
Limpopo	-	61	33	47
Mpumalanga	-	74	33	53
North West	178	-	38	84
Northern Cape	-	120	-	120
Western Cape	419	105	14	127
Total	**486**	**94**	**24**	**168**

Source: UE 2018

Responding businesses were asked to indicate the number of estimated employees per occupation according to the Major Groups of the Organising Framework for Occupations (OFO):

- Managers
- Professionals
- Technicians and associate professionals
- Clerical support workers

[10] This calculation was done by removing an outlier figure of 60 000
[11] This calculation was done by removing an outlier figure of 60 000

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- Service and sales workers
- Skilled agricultural, forestry, fishery, craft and related trades workers
- Plant and machine operators and assemblers
- Elementary occupations

These results are illustrated as percentage distribution across the occupation groups in Figure 6-18 below:

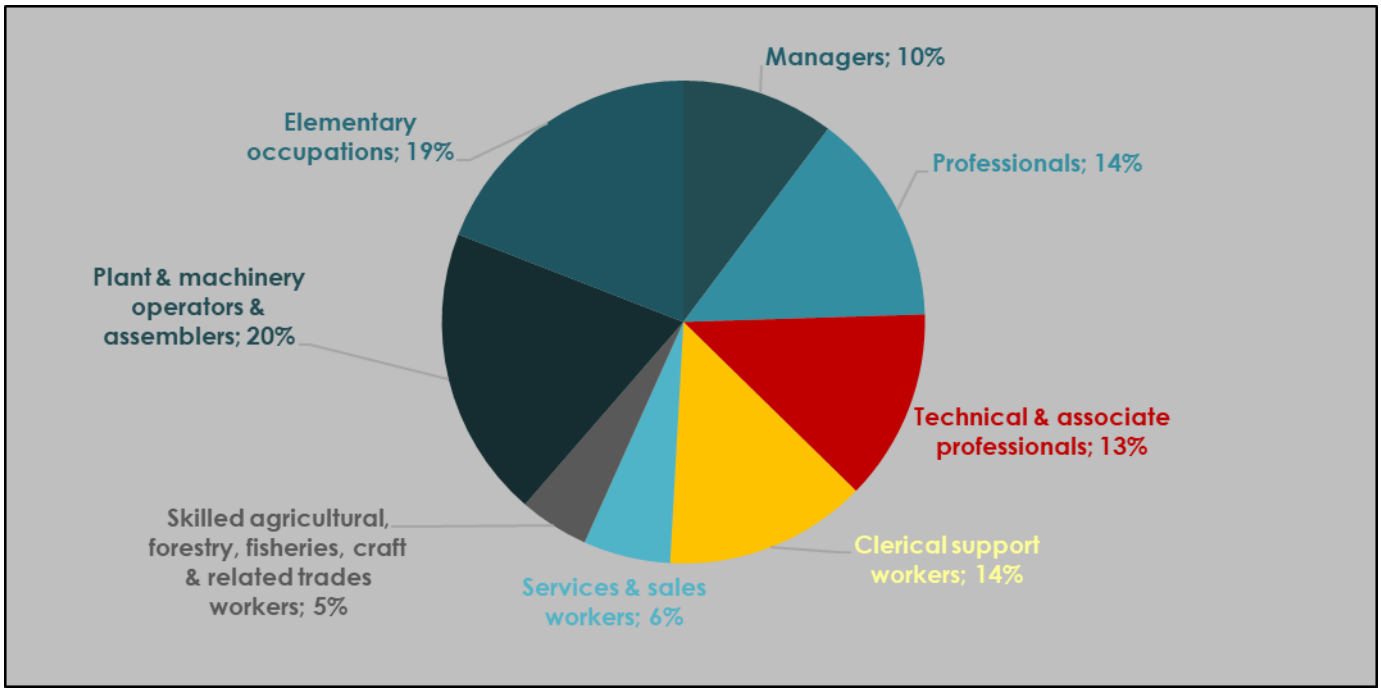

Figure 6-18: Average occupation group distribution

Source: UE 2018

The results gained from the responding businesses indicate that transport businesses are dominated by occupations that fall under the plant and machine operators and assemblers (20%) and elementary occupations group (19%). Professionals and clerical support workers respectively make up 14% of occupations, followed by technical and associate professionals (13%). Approximately 10% of occupations are managers, while 6% are service and sales workers, and 5% are skilled agricultural, forestry, fisheries, craft and related trades workers.

Responding businesses were asked to estimate the race and gender distribution for each of the different relevant occupational categories. Table 6-8 below reveals the following for transport businesses:

- Managers, professionals and technical and associate professional occupations are occupied mostly by white males. For each of these occupations, white males represent over 40% of these positions.
- Most clerical support workers are black female (37%) or white female (32%)
- Overall, black females hold the greatest share of individuals employed as service and sales workers, at approximately 37%. This is followed by white females, at about 32%.
- 54% of skilled agricultural, forestry, fishing, craft or related workers are black males, followed by white males at 33%.
- Black males hold the highest share of employed plant and machinery operators and assemblers at 70%. The second highest share is white males at 33%.
- Elementary occupations are mostly occupied by black males (63%) and black females (40%)

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Table 6-8: Race and gender distribution for the major occupation groups

	Managers	Professionals	Technical & Associate Professionals	Clerical support	Services & sales	SAFFC & related trades	Plant & machine operators & assemblers	Elementary occupations
Black Male	32%	43%	41%	31%	51%	54%	70%	63%
Black Female	14%	12%	15%	37%	22%	23%	12%	40%
Coloured Male	9%	8%	14%	12%	24%	25%	18%	14%
Coloured Female	13%	8%	6%	19%	17%	3%	1%	4%
Indian Male	18%	13%	21%	14%	17%	1%	10%	3%
Indian Female	11%	8%	10%	11%	5%	2%	9%	1%
White Male	46%	43%	49%	16%	28%	33%	12%	4%
White Female	24%	32%	20%	32%	45%	4%	2%	3%
Foreign Male	7%	10%	12%	1%	2%	4%	7%	2%
Foreign Female	1%	0%	0%	1%	1%	3%	0%	4%

Source: UE 2018

PAST AND ANTICIPATED EMPLOYMENT TRENDS BY OCCUPATION

In order to understand to what extent growth and decline occurs in major occupations, the responding businesses were asked to:

(a) Indicate how much each major occupation has grown over the past five years
(b) Indicate the anticipated employment growth for the next five years

Figure 6-19 below illustrates past employment growth trends for responding transport businesses:

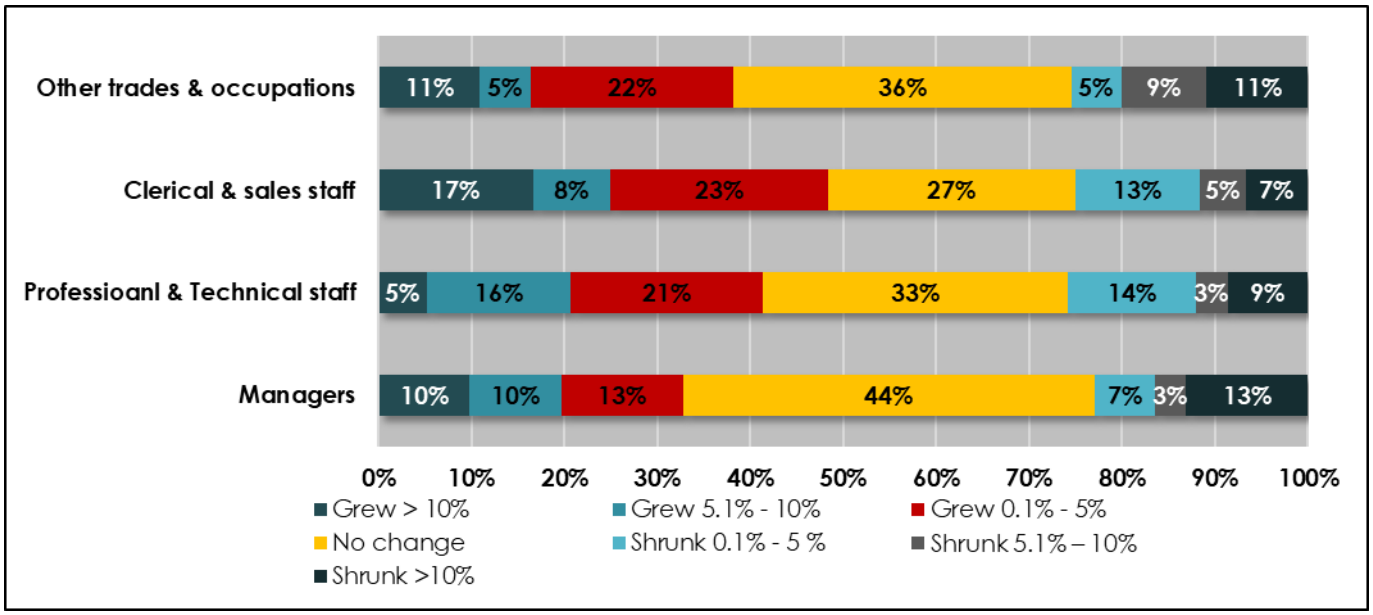

Figure 6-19: Employment trend over last 5 years by occupation

Source: UE 2018

The figure above reveals that:

- Approximately 33% of businesses experienced some degree of employment growth for **management positions** over the past five years, while 44% experienced no change. Around 23% of businesses reported a decline.

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- Around 42% of businesses experienced growth in **professional and technical staff**, 33% experienced no change and 26% experienced negative growth.
- Nearly half of businesses experienced employment growth for **clerical and sales staff** (17% of all businesses experienced growth greater than 10%), 27% experienced no change.
- For **other trades and occupations** 38% of businesses experienced growth and 36% experienced no change. Around 25% experienced a decline in trades and other occupations.

In general, most of the businesses were optimistic in responding to anticipated employment trends for the next five years. Figure 6-20 below reveals the following:

- Most of the businesses believe that **management positions** will remain stable (57%), 34% anticipate growth while 9% foresee a decline in the number of managers.
- Approximately 46% of businesses foresee no change in the employee numbers for **professional and technical staff** while nearly half believe there will be varying degrees of growth. About 6% of businesses anticipate a decline in the number of professional and technical staff.
- Around 44% of businesses anticipate no change in employee numbers for **clerical and sales staff**, while 49% anticipate growth (of which 25% of all businesses anticipate only a slight growth). Approximately 7% of businesses believe the employment will shrink for clerical and sales staff.
- For **other trades and occupations** 38% of businesses believe employment will see no change, 48% believe employment will grow, while 14% foresee a decline in employment.

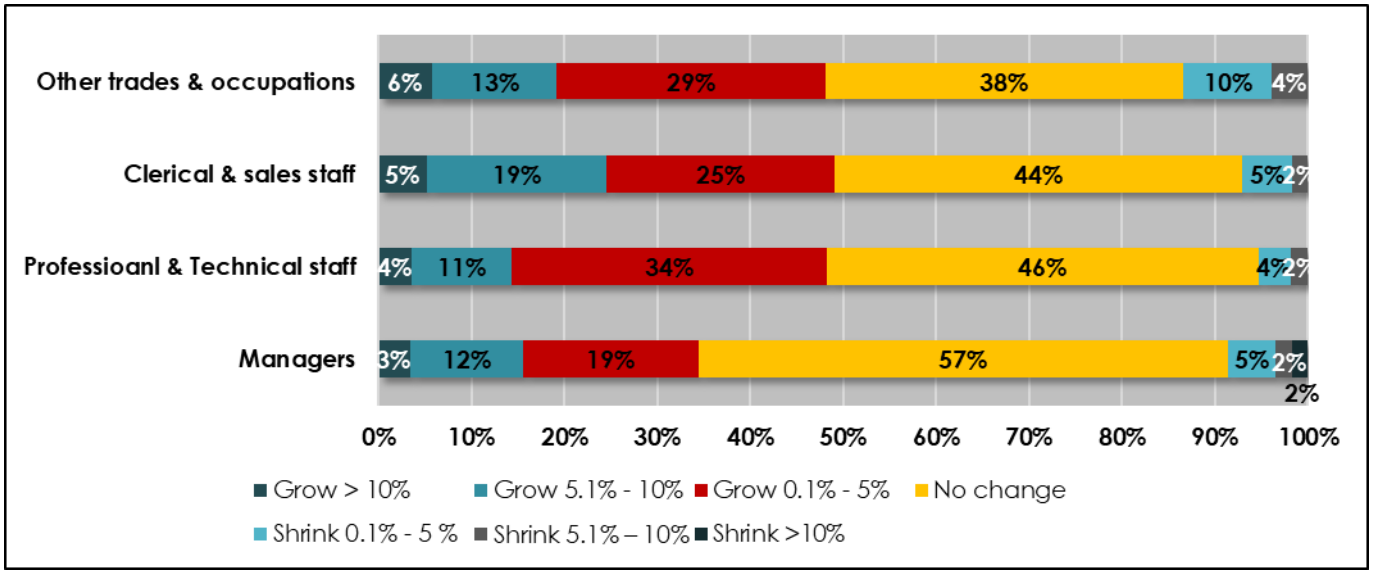

Figure 6-20: Anticipated employment trends for the next 5 years by occupation

Source: UE 2018

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6.2 PROVINCIAL OVERVIEW

This sub-section takes a look at the provincial distribution of the transport and storage sub-sector for GVA and Employment, which excludes the communication sub-sector.

Figure 6-21 below compares the GVA share of each province towards the total GVA for the sub-sector, to the total employment share (formal and informal) for 2016.

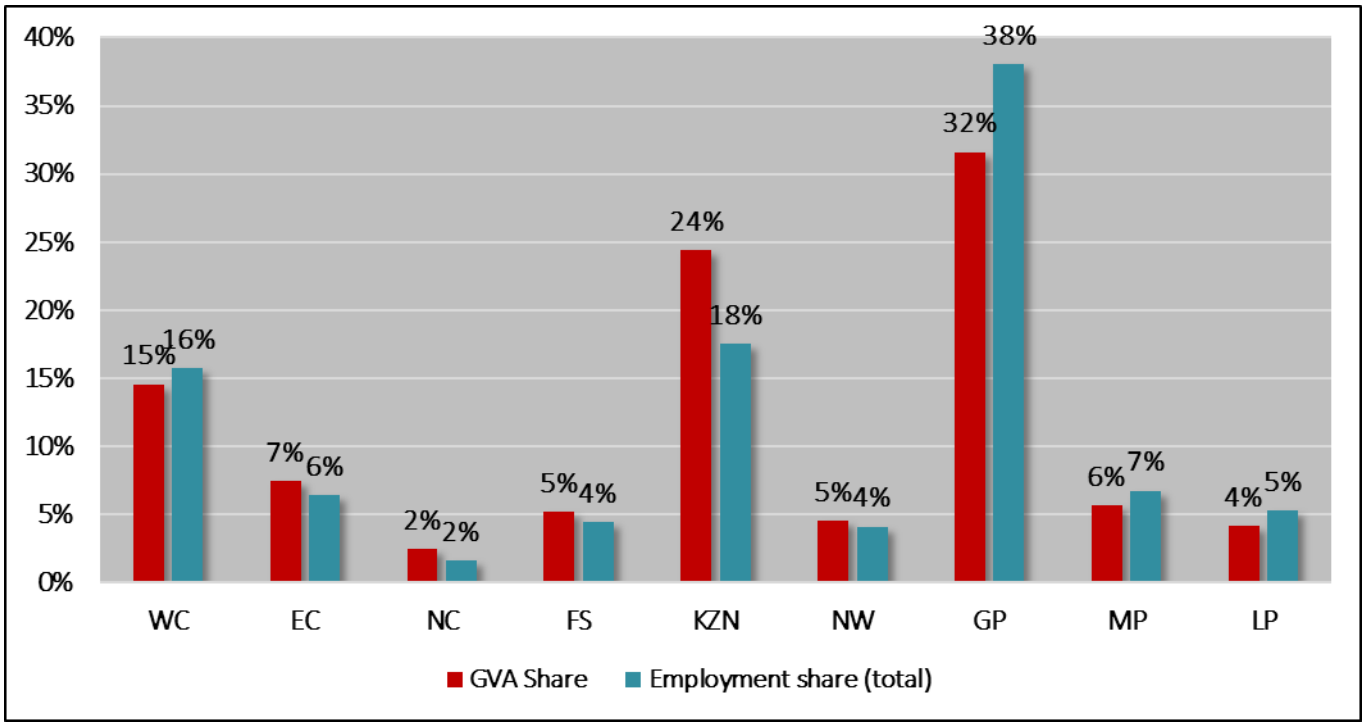

Figure 6-21: Transport and storage sub-sector share of GVA compared to total employment share (2016)

Source: Quantec 2018

As can be seen from the figure above, Gauteng is by far the most dominant province with regards to the transport sector, contributing approximately 32% towards the sub- sector's total GVA and 38% towards the total employment contribution. This is followed by Kwazulu-Natal at 24% and 18% respectively. The Province with the smallest contribution to the transport sector's GVA and employment is the Northern Cape at 2%, respectively.

When grouping coastal provinces together (KwaZulu-Natal, Eastern Cape, Western Cape and the Northern Cape) the combined contribution towards the transport and storage sub-sector's GVA adds up to 48% and total employment to 42%. This is significant to note, as coastal provinces comprise the country's ports, with established movement networks and linkages. This makes Gauteng Province's contribution even more significant, considering that it is a land-locked province. However, being the economic hub of the country, Gauteng comprises a number of airports as well as an extensive road and Rail network. Gauteng also hosts the highest population, further stimulating the transport sector and ensuring a high supply of skilled labour. The remaining provinces (Limpopo, North West, Free State and Mpumalanga) collectively contribute 20% towards the sector's GVA and employment, respectively.

The table below (*Table* 6-9) compares the average annual growth rate for the sub-sector within each province between 2006 and 2016, in terms of GVA and employment.

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Table 6-9: Average annual growth rate for GVA and employment between 2006 and 2016

Province	GVA	Employment
Northern Cape	1,3%	5,4% (357 jobs per year)
Limpopo	1,4%	4,5% (1 055 jobs per year)
North West	1,6%	4,3% (803 jobs per year)
Free State	1,0%	4,7% (909 jobs per year)
Mpumalanga	1,8%	5,7% (1 523 jobs per year)
Eastern Cape	1,7%	5,2% (1 388 jobs per year)
Western Cape	1,4%	4,5% (3 141 jobs per year)
KwaZulu-Natal	2,2%	4,1% (3 339 jobs per year)
Gauteng	1,4%	4,3 (7 389 jobs per year)
Total	**1,6%**	**4,5% (19 935 jobs per year)**

Source: Quantec 2018; UE calculations 2018

When reviewing the table, it is important to note that overall, the sub-sector shows positive growth across all sectors, both for GVA and employment. It is also apparent that KwaZulu-Natal showed the highest annual average growth rate for GVA over the time period, at 2,2%, while Mpumalanga showed the highest annual average growth rate for employment at 5,7%. An average of just less than 20 000 jobs per year have been added to the sub-sector between 2006 and 2016.

Employment within the transport and storage sub-sector consists of both formal and informal employment, of which formal employment can be broken down further into skill level.

Figure 6-22 below gives the provincial distribution of formal and informal employment within the transport and storage sub-sector.

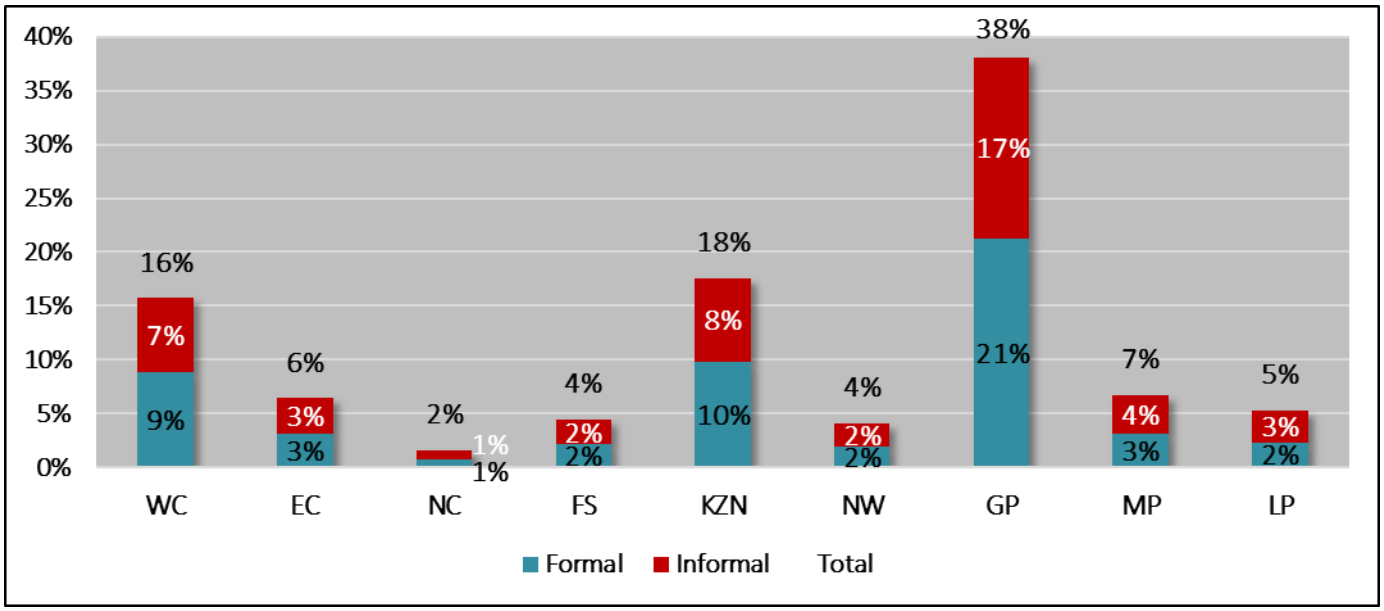

Figure 6-22: Provincial distribution of formal & informal employment for the transport & storage sub-sector

Source: Quantec 2018

It is clear that Gauteng Province holds most of the formal and informal employment for the sub-sector, as would be expected, given its overall share. It is important to note that apart from the Western Cape, KwaZulu-Natal and Gauteng, informal employment holds the same or greater share than formal employment within the transport and storage sub-sector. A lot of this could be attributed to the level of urbanism and rural characteristics of these provinces which has a direct influence on the formal networks and infrastructure.

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When examining formal employment for the sub-sector by skill level (as illustrated in Figure 6-23) it is immediately apparent that semi-skilled labour holds the majority share within each of the provinces. Once again, apart from the Western Cape, KwaZulu-Natal and Gauteng, low skilled labour within the sector holds either the same or greater share compared to skilled labour for the remaining province. This once again reiterates the level of access to infrastructure, services and networks associated with the level of development of a province, the subsequent level of education and skills of the labour force, as well as the types of skills and sophistication required for the technology, techniques and systems used within each of the provinces and their urban centres.

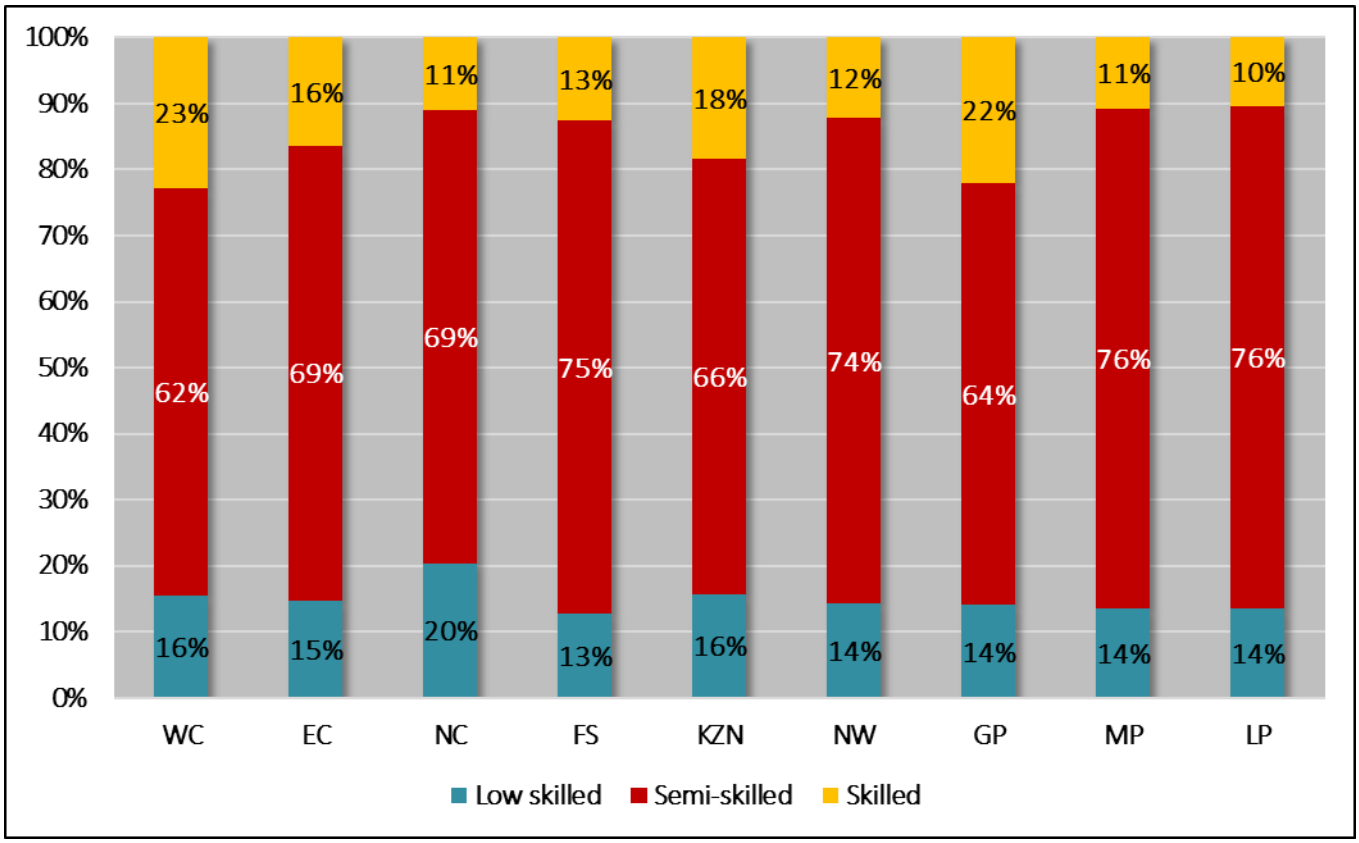

Figure 6-23: Formal employment skill level split for the transport & storage sub-sector by province, 2016

Source: Quantec 2018

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6.3 SUB-SECTORAL STATUS QUO

The status quo section describes the status of each major sub-sector in relation to what it comprises; it gives insight into the transport mode's networks and volumes, both passenger and freight, where relevant. It also describes the regional and national economic activities and GVA/GDP contribution of the transport mode to the national economy.

These major sections are followed by profiles for each mode of transport that falls under that sub-sector, in line with the relevant TETA Chamber.

These sub-sectors consist of the following (as illustrated in the diagram to the right):

Road transport
- Road passenger
- Road freight
- Taxi

Rail transport
- Rail

Air transport
- Aerospace

Water transport
- Maritime

Inter- and multi-modal transport
- Freight handling
- Forwarding & clearing

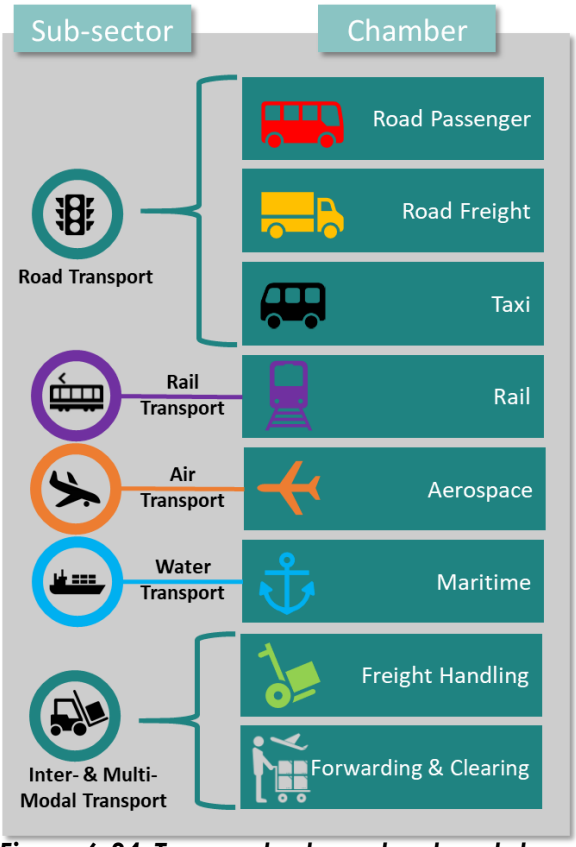

Figure 6-24: Transport sub-sectors breakdown

6.3.1. ROAD TRANSPORT STATUS QUO

Under Road Transport, there are three active sub-sectors as demarcated to TETA. These are Road Passenger, Road Freight and the Taxi industry.

The Profile section for each sub-sector will describe their business profile; their key role players; the growth trends; and key challenges of the industry as identified through the primary research methods adopted by Urban-Econ for purposes of this study. These methods include an online survey method, focus group workshops held in Cape Town, KwaZulu-Natal and in Gauteng, as well as 10 individual interviews conducted with key stakeholders identified by TETA.

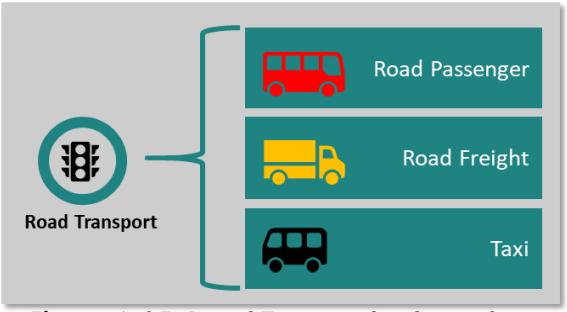

Figure 6-25: Road Transport sub-sector breakdown

The research methods employed provides first-hand feedback from the industry and informs the sub-sector profiles as seen in sections 6.3.1.1 - 6.3.1.3.

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Road transport comprises the transport of both passengers and freight on roads. This is seen in the Road Passenger and Road Freight sub-sectors. The Taxi industry is a form of passenger transport but has its own classification and mandate under TETA. The three sub-sectors can be described as follows:

Road Passenger

The Road Passenger industry, in accordance with TETA classification, refers specifically to mass transit of passengers through bus transport. The following activities comprise the Road Passenger sub-sector:

- Transporting passengers by bus or mini-bus at a fee (this, however, excludes the minibus Taxi industry)
- Long distance bus services
- Tour and charter bus services
- Cross-border bus services
- Intercity bus services
- School/learner bus services
- Commercial contract bus services
- Special hire or private hire bus services
- Subsidised and non-subsidised bus services
- Scheduled and unscheduled bus services

Road Freight

The Road Freight industry, as its name would suggest, involves the movement of goods via roads. Freight are most commonly moved between airports, Rail yards, ports and distribution centres, and between pipeline depots and petrol stations (also known as the first mile) and between the distribution centres and retailers/consumption zones (also referred to as the last mile).

Road freight is important in linking the various modes of transport and is key in completing the freight logistics supply chain. It is estimated that Road Freight is responsible for the moving of nearly 80% of all freight in the country on an annual basis.

Freight are generally transported by means of various vehicles, which can range from motorcycles with an engine capacity of 125 cubic centimetres or less (drivers licence code A1) to articulated vehicles with a gross combination mass greater than 18 000 kg (drivers licence code EC). These typically include:

- Dry bulk transport carriers
- Abnormal load transporters
- Hazardous chemical carriers
- Retail fleet (fast moving consumer goods)
- Courier companies
- Waste material transportation

Taxi

The Taxi industry is associated with the transportation of passengers in vehicles other than buses, at a fare. This industry is dominated by the minibus Taxi industry, which is known to be largely unregulated in terms of formal economic practices.

The Taxi industry transports by far the biggest number of passengers on any given day, compared to both Rail and bus. According to van Zyl (2009), the minibus Taxi industry carries 65% of the country's public transport passengers. The industry has a big role to play in the future of a sustainable system in the country. The Taxi Recapitalisation Policy (TRP) has been an intervention by government to bring about safe,

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effective, reliable, affordable and accessible Taxi operations by introducing New Taxi Vehicles (NTVs) designed to undertake public transport functions in the Taxi industry.

In recent times however, the Taxi industry has seen radical changes with e-hailing services such as Uber and Taxify, labelled as "disruptive innovators" (Ndlovu, 2017), causing tension amongst the metered Taxi industry. The Taxi industry consists of the following activities:

- Minibus Taxis
- Metered Taxis
- E-hail Taxis
- Scholar transport
- Shuttle services
- Chauffeur drivers

ROAD NETWORKS AND VOLUMES (PASSENGER & FREIGHT)

The Department of the National Treasury (2011) states that South Africa has an extensive road network of approximately 747 000 km, the longest network of roads of any African country. Of this, 532 000 km comprise proclaimed national, provincial and municipal roads, and about 220 000 km of unclassified roads. Most of the un-proclaimed roads are access roads, serving rural communities.

While the Department of Transport is responsible for overall policy, road-building and maintenance is the responsibility of the South African National Roads Agency (SANRAL) as well as the nine provinces and local governments. SANRAL is responsible for the country's network of national roads (SANRAL, 2018).

Moreover, the demand for road transport is reflected mainly in the usage levels and transport volumes of both freight and passenger transport. Available figures were collected from the *Stats SA P7162 Statistical Release: Land Transport* from 2013 to 2017.

Stats SA conducts monthly surveys of land transport enterprises, which includes most Rail and Road Freight and passenger transport, but **excludes** minibus Taxis, metropolitan buses (including the Bus Rapid Transport system – BRT) and the rental of private cars/buses/trucks without drivers (Stats SA, 2018).

Figures for freight and passenger transport are provided in Table 6-10 below.

Table 6-10: Road transport volumes and passengers

Road transport	2013	2014	2015	2016	2017	Annual growth
Freight (Volumes '000 tonnes)	577 859	619 008	595 175	615 942	683 267	**19 693**
Passengers (Journeys '000 persons)	310 604	333 314	329 972	305 496	320 283	**1 912**

Source: Stats SA, 2014; 2015; 2016; 2017; 2018

Since 2013, the volumes of freight transported on South African roads increased by approximately 105 million tonnes, from 578 million tonnes in 2013 to 683 million tonnes in 2017. The average annual growth is calculated at approximately 19,7 million tonnes per year over the five-year period in question.

Passenger journeys has seen an increase of approximately 9, 7 million persons from approximately 310 million in 2013 to 320 million in 2017. This translates to an average growth of approximately 1,9 passengers/journeys per year since 2013 to 2017.

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According to the National Household Travel Survey (Stats SA, 2013) approximately 69% of households used **minibus Taxis** in 2013, which grew by approximately 10% over a ten-year period from 2003. The General Household Survey 2017 however indicates that approximately 37% of households had at least one household member that used a minibus Taxi or the like during the week preceding the survey (Stats SA, 2017). According to a statement on the South African National Taxi Council (SANTACO), the minibus Taxi industry is responsible for transporting approximately 65% of the annual passenger trips in urban areas (SANTACO, 2018).

Contradicting statements and varied estimates with regards to the minibus Taxi industry is commonplace, considering that the minibus Taxi industry is not a formal, regulated or subsidised industry and as a result, accurate data on the industry is not available.

ECONOMIC CONTRIBUTION

The lowest level of statistical data available in relation to road transport is reported according to the 'land transport, transport via pipelines' activity. As stated earlier, this includes Railway transport (freight and passenger), all other transport by road (scheduled and non-scheduled transport of passengers as well as all freight).

It is therefore not possible to accurately report on GVA and employment contribution for road transport. However, the *Statistics SA P7162 Statistical Release: Land Transport* provides some insights on the national income derived from Road Freight and Road Passenger enterprises (Stats SA, 2018). These are set out in Table 6-11 below:

Table 6-11: Road transport income for freight and passengers (current prices)

Road transport	2013	2014	2015	2016	2017
Freight (Income Rand 'million)	85 479	95 265	92 586	97 679	110 069
Passengers (Income Rand 'million)	7 894	8 981	9 221	9 404	9 532
Total	**93 373**	**104 246**	**101 807**	**107 083**	**119 601**

Source: Stats SA, 2014; 2015; 2016; 2017; 2018

The *Statistics SA P7162 Statistical Release: Land Transport* states that the data is used to derive/compile estimates of the gross domestic product (GDP) for the different economic sectors.

However, by examining the certain aspects related to the 'land transport, transport via pipelines' activity, some conclusions with regards to the road transport industry can be made. The following figure illustrates the provincial GVA share for land transport and transport via pipelines.

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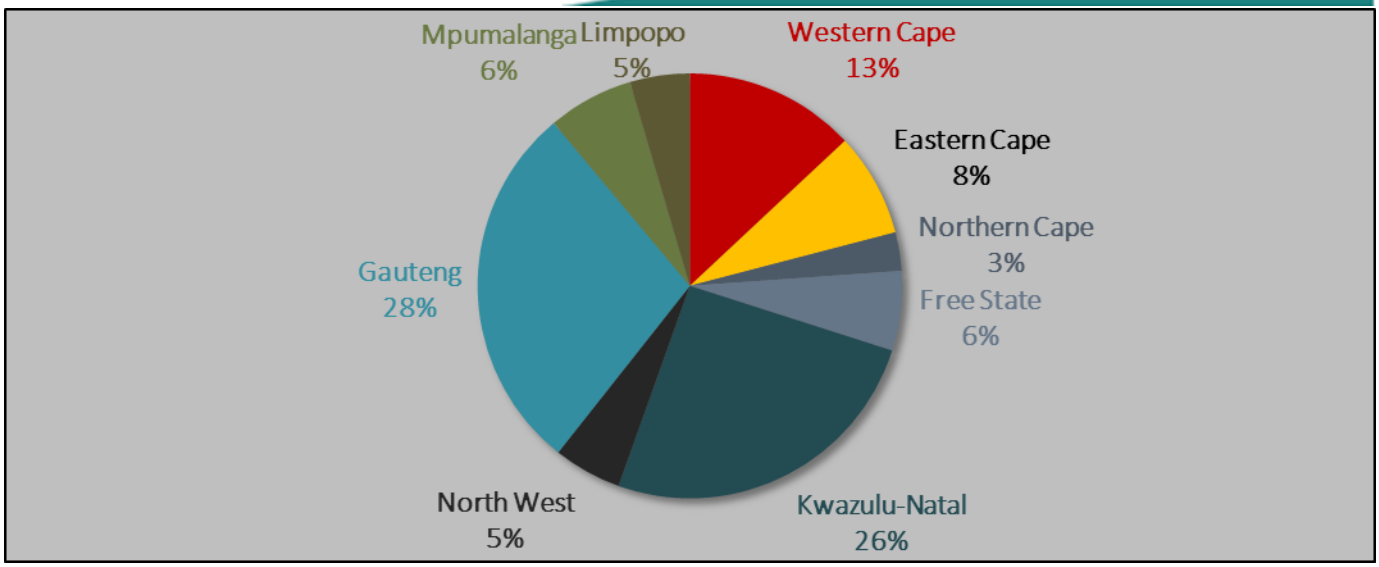

Figure 6-26: Land transport, transport via pipelines provincial GVA share, 2016

Source: Quantec 2018

Gauteng province holds the greatest GVA share of land transport and transport via pipelines at 28%, followed closely by KwaZulu-Natal at 26%. It can thus be concluded that Road Freight and Road Passenger transport will follow the same trend.

Figure 6-27 below gives a visual representation of the employment share for land transport and transport via pipelines.

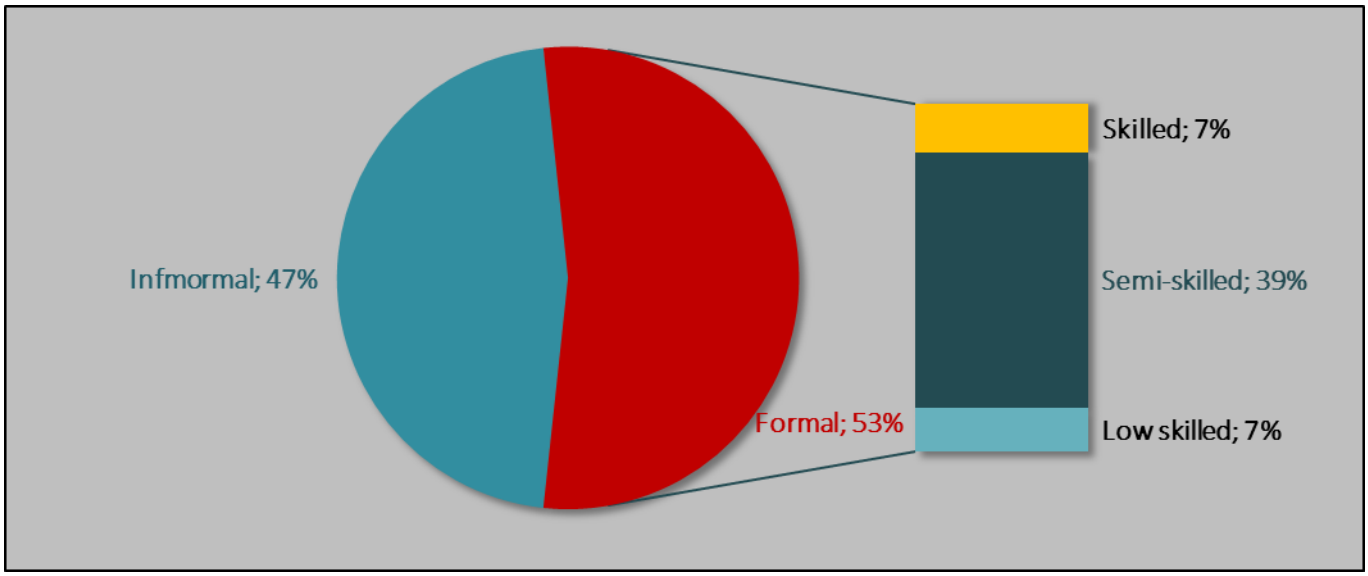

Figure 6-27: Land transport, transport via pipelines employment share, 2016

Source: Quantec 2018

From the figure it is evident that 53% of the workforce are formal. A total of 39% of the workforce are semi-skilled, with skilled and low skilled employees making up 7% of the total employment share, respectively. Approximately 47% of the workforce is informal.

The table below gives the provincial share of land transport and pipeline transport, which clearly highlights the fact that Gauteng holds the greatest share of employment.

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Table 6-12: Provincial share of employment for land transport and transport via pipelines, 2016

Province	Formal		Informal		Total	
Western Cape	31 177	14%	23 091	12%	54 268	13%
Eastern Cape	14 197	6%	14 292	7%	28 489	7%
Northern Cape	4 165	2%	4 205	2%	8 370	2%
Free State	11 388	5%	12 016	6%	23 404	6%
KwaZulu-Natal	42 395	19%	33 833	18%	76 228	19%
North West	9 691	4%	10 841	6%	20 532	5%
Gauteng	78 682	36%	61 950	32%	140 632	34%
Mpumalanga	16 019	7%	17 820	9%	33 839	8%
Limpopo	11 289	5%	13 050	7%	24 339	6%
Total	**219 003**	**100%**	**191 098**	**100%**	**410 101**	**100%**

Source: Quantec 2018

Once again, it can be concluded that road transport (freight and passenger) will follow the same trend with regards to employment figures for land transport, transport via pipelines.

When considering informal employment, it should be noted that SANTACO indicates that the minibus Taxi fleet consist of around 130 000 vehicles with legal transport permits, and that more than 43 000 of those vehicles operate within Gauteng (SANTACO, 2018). It is further estimated that the minibus Taxi industry generates a turnover of over R16,5 billion a year and that it employs more than 200 000 individuals.

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6.3.1.1 ROAD PASSENGER PROFILE

The following sub-section provides insights into matters not necessarily contained within secondary or official data sources. Extensive primary research has been undertaken which informs aspects of the Road Passenger Chamber related to:

- The profile of Road Passenger businesses
- The different role-players active within the Road Passenger industry, and their respective functions
- Growth trends experienced within the Road Passenger industry
- Specific challenges faced by the Road Passenger industry

BUSINESS PROFILE

Surveys were distributed to transport businesses to form a greater understanding of the dynamics of transport businesses (please refer to ***Section 2 Research Approach***).

The results for businesses that fall within the Road Passenger Chamber are discussed according to the following aspects to provide greater insights:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

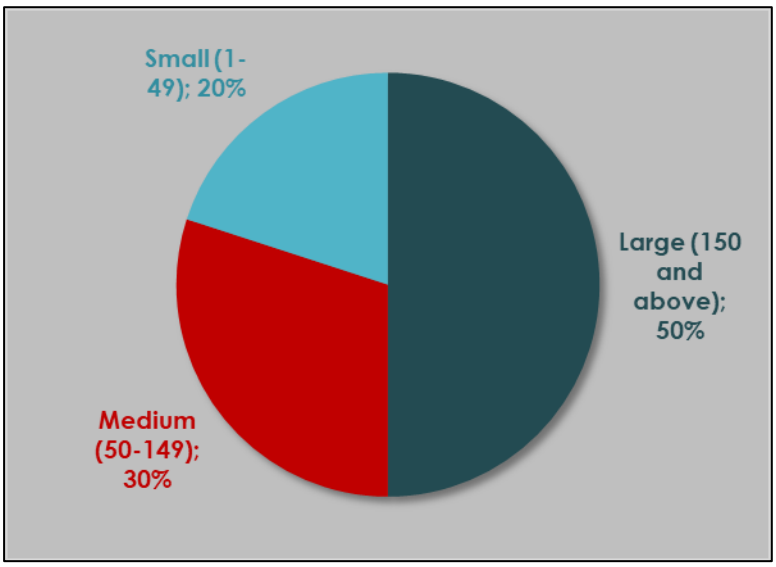

Figure 6-28: Road Transport Business size

Approximately half of responding businesses within the Road Passenger Chamber are classified as large (employing 150 or more people), 30% are medium (employing between 50 and 149 people) and 20% are small (employing less than 50 people). These results are illustrated in Figure 6-28:

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GEOGRAPHIC DISTRIBUTION

Responding businesses were asked to indicate the location of the business head office. These results are illustrated in Figure 6-29.

None of the responding Road Passenger businesses had a head office located Limpopo, Free State, or the Northern Cape.

The greatest concentration of head offices is found in Gauteng (30%), followed by the North West and Mpumalanga (20% respectively), and KwaZulu-Natal, Eastern Cape and the Western Cape (10% respectively).

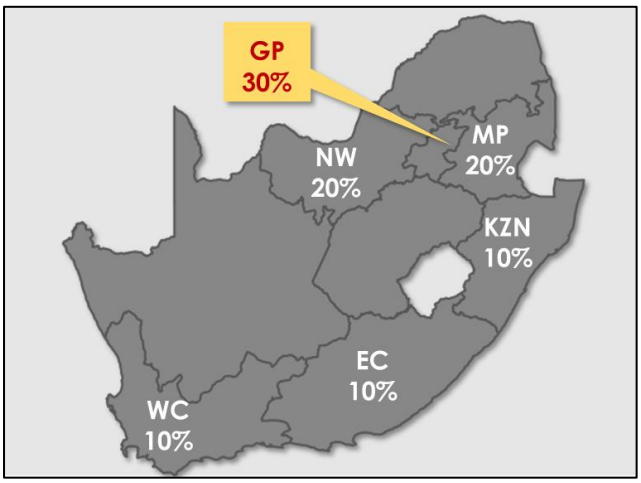

Figure 6-29: Geographic distribution for Road Passenger Businesses (head office)

EMPLOYMENT PROFILE

Responding businesses were asked to indicate the number of estimated employees per occupation according to the OFO Major Groups. These results are illustrated as percentage distribution across the occupation groups in Figure 6-30 below:

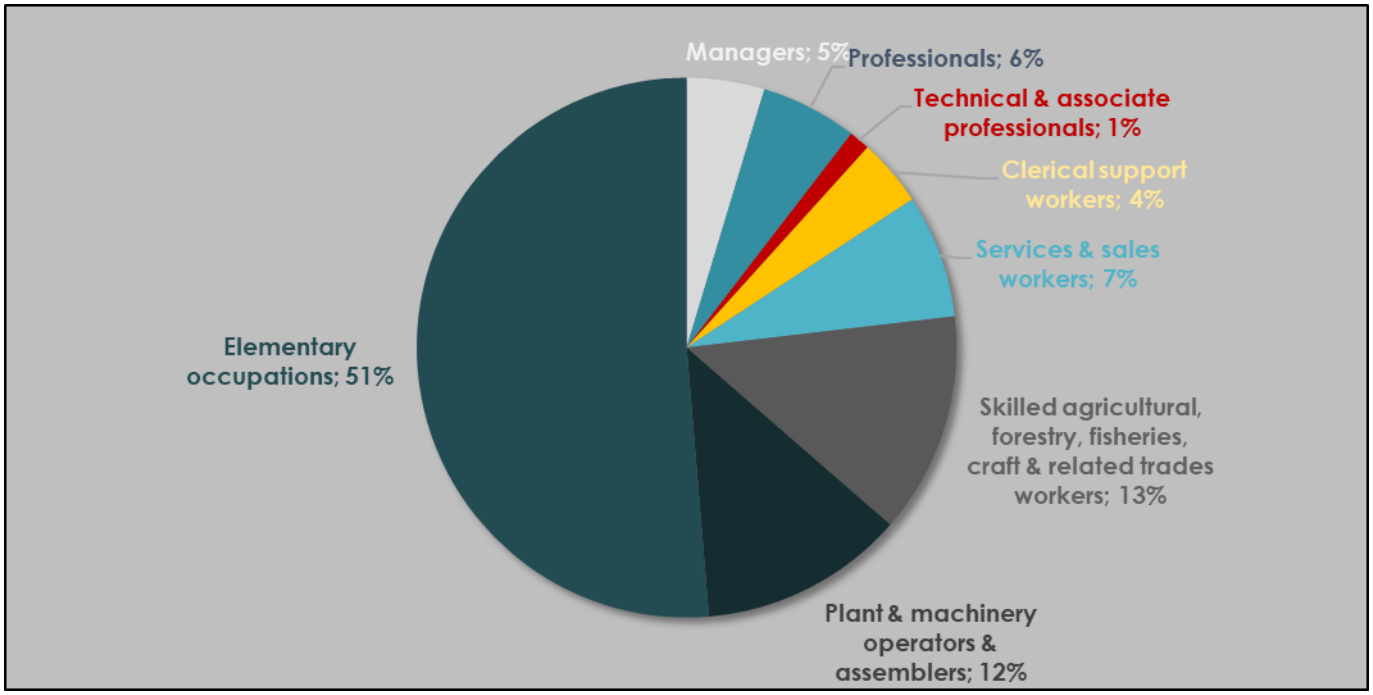

Figure 6-30: Road Passenger Business average occupation group distribution

Source: UE 2018

The results indicate that Road Passenger businesses are dominated by elementary occupations. On average, just more than half (51%) of the employees in a Road Passenger business consist of elementary occupations. Skilled agricultural, forestry, fisheries, craft and related trades workers make up an average of 13% of occupations, followed by plant and machinery operators and assemblers (12%). Approximately 7% of occupations are services and sales workers, followed by 6% professionals, 5% managers and 4% clerical support workers. Technical and associate professionals make up only 1% of employees in Road Passenger businesses.

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PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Responding businesses were asked to reflect on past employment trends as well as to give an indication of the anticipated employment growth, by occupation group.

Figure 6-31 below reveals that businesses experienced similar growth in Managerial positions and Clerical and sales positions, and similar growth for professional and technical staff and other trades and occupations.

Approximately 25% of businesses experienced growth more than 10% in managerial and clerical and sales positions while 25% experienced growth between 0.1% and 5% for these positions. About 25% experienced no change and 25% experienced a decline in these positions of more than 10% over the past 5 years.

For professional and technical staff and other trades and occupations, 33% of Road Passenger businesses reported growth of between 01% and 5%, 33% reported no change while the remaining 33% experienced a decline for these occupations of more than 10%.

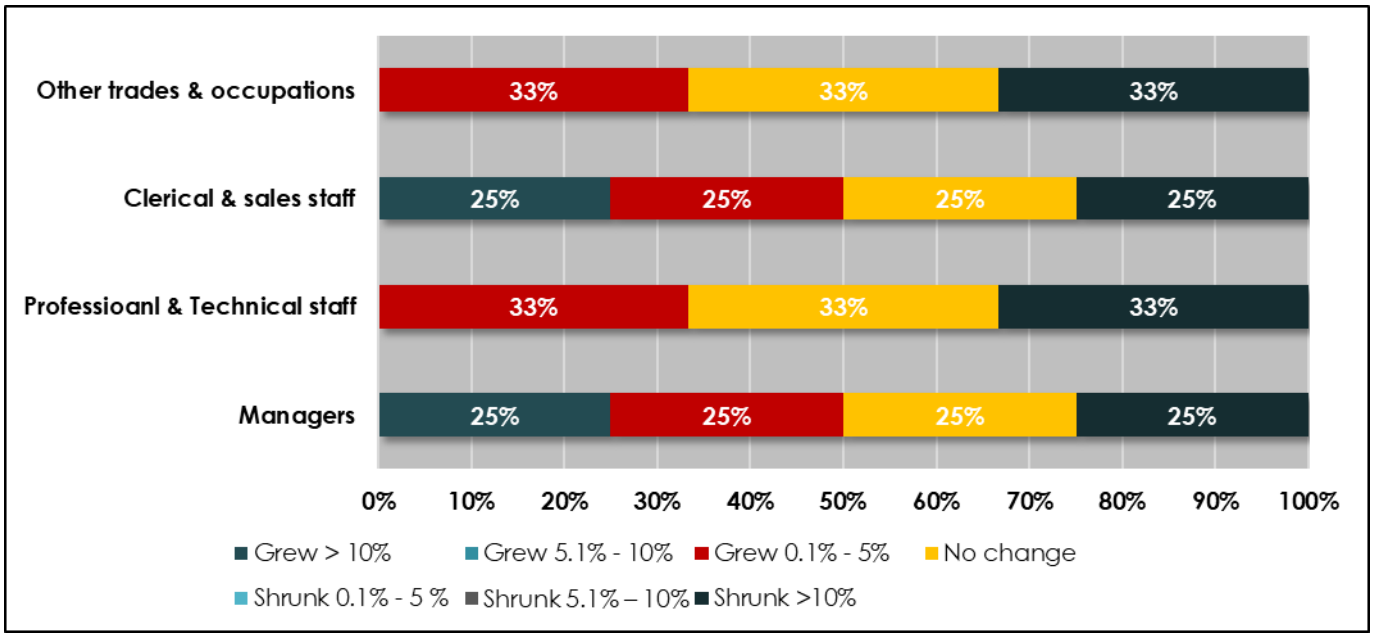

Figure 6-31: Road Passenger Businesses employment trends over last 5 years

Source: UE 2018

Figure 6-32 below reveals that 50% of businesses anticipate managerial positions and other trades and occupations to grow between 0.1% and 5% while 50% anticipate no change. All businesses feel that professional and technical positions will grow between 0.1% and 5%. For clerical and sales positions, 33% of businesses believe the positions will grow more than 10% over the next five years, 33% anticipate growth between 0.1% and 5% while 33% anticipate no change.

It should be noted that none of the responding businesses anticipate a decline for the occupations over the next five years.

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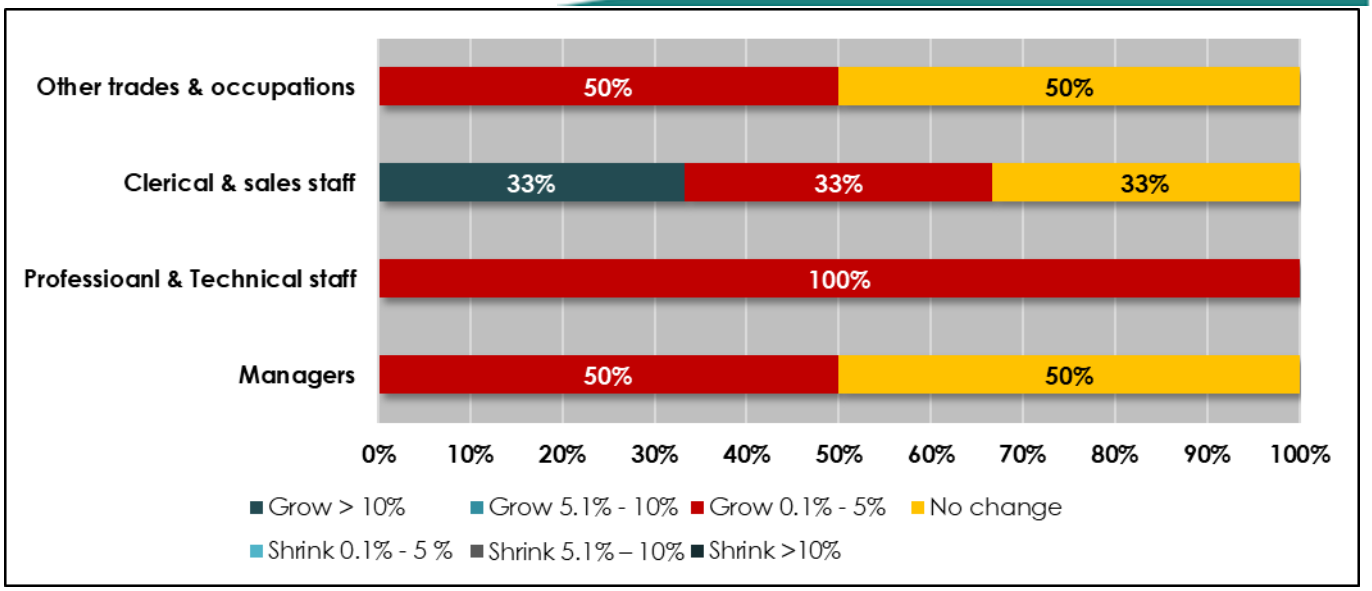

Figure 6-32: Road Passenger Business anticipated employment trends for the next 5 years

Source: UE 2018

ROLE-PLAYERS

A number of role-players have a bearing on the road transport industry, comprising both government agencies or parastatals, and other non-government organisations. It is acknowledged that there is a significant number of peripheral entities that may also indirectly have a bearing on the sector; however, for the purposes of this report, only the main role-players for each sub-sector are listed and briefly described below (and under the Role-Players sub-heading per sub-sector).

The key role-players identified through the stakeholder engagements for the Road Passenger sub-sector are likely to overlap with the other two sub-sectors. During the interviews conducted it was agreed that the Road Passenger sub-sector is well-organised, considering there are over 25 000 buses on SA's roads. In terms of regulation, the sector anticipates the newly legislated Administrative Adjudication of Road Traffic Offences (AARTO) demerit system, which is designed to encourage drivers to follow traffic laws by levying penalties and constituting a points demerits system for traffic infringements, such as not paying e-tolls (Polity, 2018).

Some of the penalties involve blocking the renewal of the driving license or a motor vehicle license, as well as incurring demerit points which suspends the driver for 3 months for every demerit point accrued over the maximum of 12 points (Polity, 2018). Industry associations in the Road Passenger industry fear that, as a consequence, they would have to spend more money than they can afford on administration. They could train their drivers more strictly and enforce stricter compliance rules. However, because of institutional disagreements between the Division of Revenues Act (DORA), SARS and the Department of Transport, they do not receive the necessary funding (or face capped funds) to ensure they can run processes as effectively as possible. At this point in time, they cannot even afford to replace old buses on the road with new buses as is expected. Other issues that were brought up in the interviews include industry associations inability to train drivers at a more professional level, and how urbanisation and population growth has buses working pick up points that are not paid for by the government, or relevant bodies. When they do try to claim for the extra services rendered by buses, they are confronted with DORA and capped funds. The above shows that the role players do not operate in silos as they are impacted by various legislative and regulatory controls that affect the economic growth and skills development in the sector.

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The key role-players identified through the stakeholder engagements for the Road Freight sub-sector are as follows:

STATUTORY AND AUTHORITY BODIES

- *The Department of Transport (DoT)*
  The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities and other levels of government, regulating through setting norms and standards, and monitoring implementation (National Government, 2018).

- *South African Revenue Services (SARS)*
  SARS is an organ of state outside the Public Service collecting and administering all national taxes, duties and levies imposed under national legislation, such as the Skills Development Levy (SDL) that is used for employee training and skills development (National Government, 2018).

- *South African Road Passenger Bargaining Council (SARPBAC)*
  SARPBAC is the council that negotiates with unions. It is also the council whereby road transport vehicles for public use must be registered to adhere with regulations set out by DoT (SARPBAC, n.d.)

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *South African Bus Employers Association (SABEA)*
  SABEA is bus and coach industry employers' organisation.

- *South African Bus Operators Association (SABOA)*
  SABOA represents interest of its stake holders and government. It functions as a watchman of policy, legislation and training facilities of its SMME members; it accounts for 76% of bus fleet in SA (Transport Forum, 2018).

- *Cross-Border Road Transport Agency (C-BRTA)*
  C-BRTA was formed to regulate cross border transport though law enforcement. It is playing an important role by so doing in terms of promoting economic development in South African Development Community (SADC by facilitating access to markets at cross border level (Anon., 2016).

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018)

- *Democratised Transport Logistics and Allied Workers Union (DETAWU)*
  Formed in 2015, DETAWU is a single global partnership trade union that fights for equitable redistribution of the economy and genuine economic empowerment of workers in various economic sectors (DETAWU, 2018).

- *South African National Small Bus Operators Council (SANSBOC)*
  This Council was established in 2012 to act as a representative body for bus operators who own a maximum of 30 buses that carry 35 or more seated passengers (WC Government, 2014).

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- *Motor Transport Workers Union (MTWU)*
  MTMU fights for workers freedom and rights in the country (MTWU, 2018)

- *Commuter Bus Employers Organisation (COBEO)*
- *National Transport Movement (NTM)*

OTHER ROLE PLAYERS

- *SANRAL*
  SANRAL's mandate is to maintain and finance road networks in South Africa (SANRAL, 2018).

- *Arrive Alive*
  Aims to develop an effective road safety information portal to save lives on roads (Arrive Alive, 2018).

- *Road Traffic Infringement Agency (RTIA)*
  RTIA mandate is to decriminalise road traffic infringements and deal with them through administrative processes, which includes excessive speeding and driving under the influence (Anon., 2016)

- *National Union of Metal Workers of South Africa (NUMSA)*
  Formed in 1987, NUMSA is the biggest metalworkers trade union in South Africa affiliated with the following sectors: engineering, motor, auto/tyre, and electronics (NUMSA, 2013).

- *The 'Big 7' bus companies*
  PUTCO, Golden Arrow, Thembalethu, Algoa, AB359, Unitrans, and City to City.

- *The Department of Labour (DoL)*
  The Department of Labour publishes legislation that regulates labour practices and activities. It plays a significant role in reducing unemployment, poverty and inequality through a set of policies and programmes developed in consultation with social partners (NBCRFLI, 2015).

GROWTH TRENDS

The growth trends identified in the stakeholder engagements allude to factors such as international trends that will positively reflect in the transport industry practices abroad and domestically. It also considers the shifts in the industry that will improve efficacy and productivity in the present and near future in the Road Passenger sub-sector; some are already in place.

Some of the evolving trends and shifts that were highlighted during the primary research phase or stakeholder engagements emerged under three reoccurring themes, namely technology, transformation and occupations. The trends are thus discussed under these three themes as follows:

Technology
Many of the emerging operations used overseas are becoming trends domestically. Some can be observed in how buses in South Africa are fast becoming equipped with Wi-Fi, allowing customer satisfaction especially on longer passenger journeys. The following are more examples of technology advancements in the sector,

- BRT (Bus Rapid Transit System) buses are becoming more digital and will make use of app-based operations soon.

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- There is a move towards 'green' busses; there is an increase in the manufacturing of hybrid buses comprised of diesel/LPG or Liquefied petroleum gas combinations. Electric buses or buses that are powered by electricity are also being adapted in very advanced countries. In SA, we are more likely to see better fuel management and fuel consumption practices to curb the rising cost of fuel, travel and cargo carrying. There are also reports of fuel theft, so this will likely be more imminent here than electricity fuel vehicles.
- The use of smart cards to allow for 'cashless' rides and which are universal, meaning they can be used for different modes of transportation.
- Buses and other vehicles will make use of automated driving, which will see many passenger and freight transportation vehicles become driverless and likely to be operated from a centralised station which will require significantly less people to man. On the other hand, while person-drivers are still the norm, professionally trained drivers are finding more demand since they are less high-risk and more dynamic than simply knowing how to steer a vehicle.

Transformation/Equity

- The Road Passenger industry is seeing an increase towards the placement of female bus drivers. The industry currently perceives women bus drivers to be more customer-orientated and more reliable
    - PUTCO has a flagship programme for women drivers, supervisors and managers, and women executives to drive women empowerment and gender equity in the Road Passenger industry.

Projected Economic Performance

The stakeholders interviewed expect that technology in the South African industry could likely have a negative impact on the economic performance of the sub-sector. However, it appears that the issue of employment numbers is being conflated with economic performance, which is not accurate.

There is a general sense across the sub-sectors that technology could impact on the employment numbers, specifically in a country like SA, where most unskilled and semi-skilled persons rely on jobs such as driving for passenger transportation. However, it should not be disregarded that employment could simply shift for these people employed in these sectors. With upskilling and re-skilling, they will have the opportunity to continue in the industry, perhaps in a different capacity than they are used to, or simply by integrating what they already do with digitally enhanced or operated forces. It is about adapting to the changing nature of the workforce. The stakeholder engagements revealed that jobs in the sector such as drivers, filing clerks, route controllers and ticket sellers will face redundancy; at the same time, they do realise that this is a chance to open opportunities for further training and skills development for these people.

In essence, their jobs will be simplified. Productivity will be increased. Employment will become innovative and in line with the rest of the world. The result could positively reflect on the country's economic profile as a whole. The workers, employers, industry and the government should be open to the changes and adapt to them. The sooner this happens, the sooner solutions can be created that eliminates the incessant fear around job losses to technology, and inevitably the Fourth Industrial Revolution (4IR).

KEY CHALLENGES

The need for a more reliable transportation system is what is motivating the use of digitally operated and automated vehicles. The public transport system in South Africa is a huge industry and supports the development and sustainability of the working classes and smaller businesses. However, it is not without its challenges. The need to have a public transport system that is faultless, reliable and without frequent

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interruption will see many of those who are employed in the system as drivers, marshals, etc., left to either upskill to fit into suitable replacement posts or left jobless if they fail to adapt.

Moreover, urban areas are expected to become more densely populated as the working young seek to be closer to their places of work and other urban amenities. This group of people are also more likely to make use of e-hailing services to get around. This circumvents the current public transport system of buses and Taxis. This could likely impact on their relevancy in the future; however, it is not likely to see effect in SA any time soon.

Other challenges influenced by change drivers that face the Road Passenger transport industry include:

- The modernisation of fleets impacts the older working group the most. Older generations find it difficult to adapt to technology-related operations both in the office and on the road.
- Lack of skills transfers in the sector. The industry would rather recall retired employees as consultants than install a skills transfer's project. This results in an erosion of skills in the sector. This also reflects in the employment landscape of the industry, which is dominated by older white males, with little representation for women.
- The increasing price of fuel, levies and tolls combined with the limited subsidies received for public transport impacts on its ability to handle change and adapt.
- Road works infrastructure
- Industrial action
- Driver license fraud. In fact, drivers should be trained in defensive driving, but they would have to be equipped with proper licenses and driving skills to begin with.

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6.3.1.2 ROAD FREIGHT PROFILE

This sub-section will profile the Road Freight industry through insights gained during the extensive primary data gathering exercise. Aspects profiled include:

- The Road Freight businesses
- The different role-players active within the Road freight industry, and their respective functions
- Growth trends experienced within the Road Passenger industry
- Specific challenges faced by the Road Freight industry

BUSINESS PROFILE

Results gained from the surveys distributed to transport businesses were analysed per Chamber (please refer to ***Section 2 Research Approach***). These results provide additional insights into Road Freight businesses for the following aspects:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

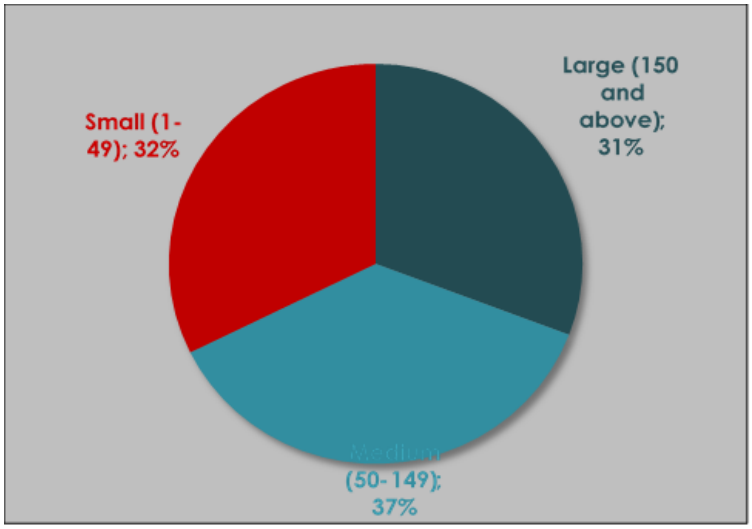

Figure 6-33: Road Freight Business Size

Approximately 31% of responding Road Freight businesses are classified as large, with more than 150 employees. Medium businesses, employing between 50 and 149 people made up 37% of responding businesses. About 32% of responding businesses are classified as small, with less than 50 employees.

These results are illustrated in Figure 6-33.

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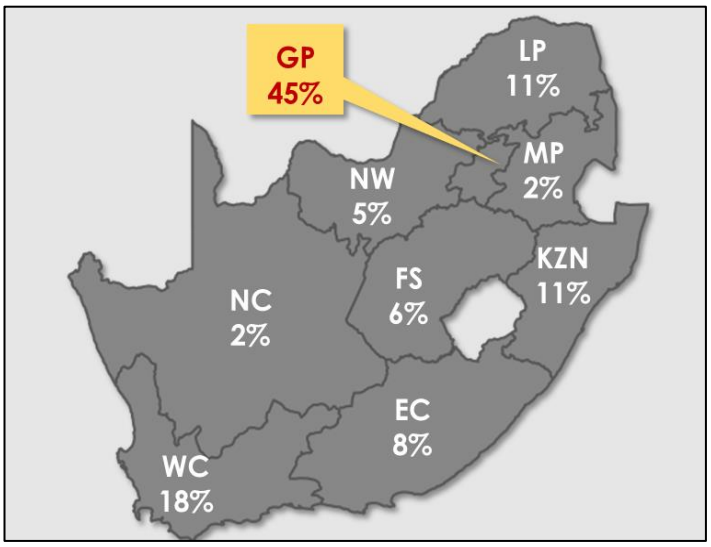

Figure 6-34: Geographic distribution for Road Freight Businesses (head office)

GEOGRAPHIC DISTRIBUTION

Responding businesses were asked to indicate the location of the business head office. These results are illustrated in Figure 6-34.

The greatest concentration of head offices is located in Gauteng (45%), followed by the Western Cape (18%) and KwaZulu-Natal and Limpopo (11% respectively).

Approximately 8% of Road Freight businesses have head offices in the Eastern Cape, 6% in the Free State, 5% in North West and only 2% in the Northern Cape.

The distribution of Road Freight businesses can be related back to the location of key economic nodes and points of entry (airports, harbours and border posts).

EMPLOYMENT PROFILE

Responding businesses were asked to indicate the number of estimated employees per occupation according to the OFO Major Groups. These results are illustrated as percentage distribution across the occupation groups in Figure 6-35.

Approximately 33% of all Road Freight employees are employed as plant and machinery operators and assemblers, followed by elementary occupations (19%). Managers make up 14% of all employees, clerical and support workers 9%. Services and sales workers consist of only 6% of all employees.

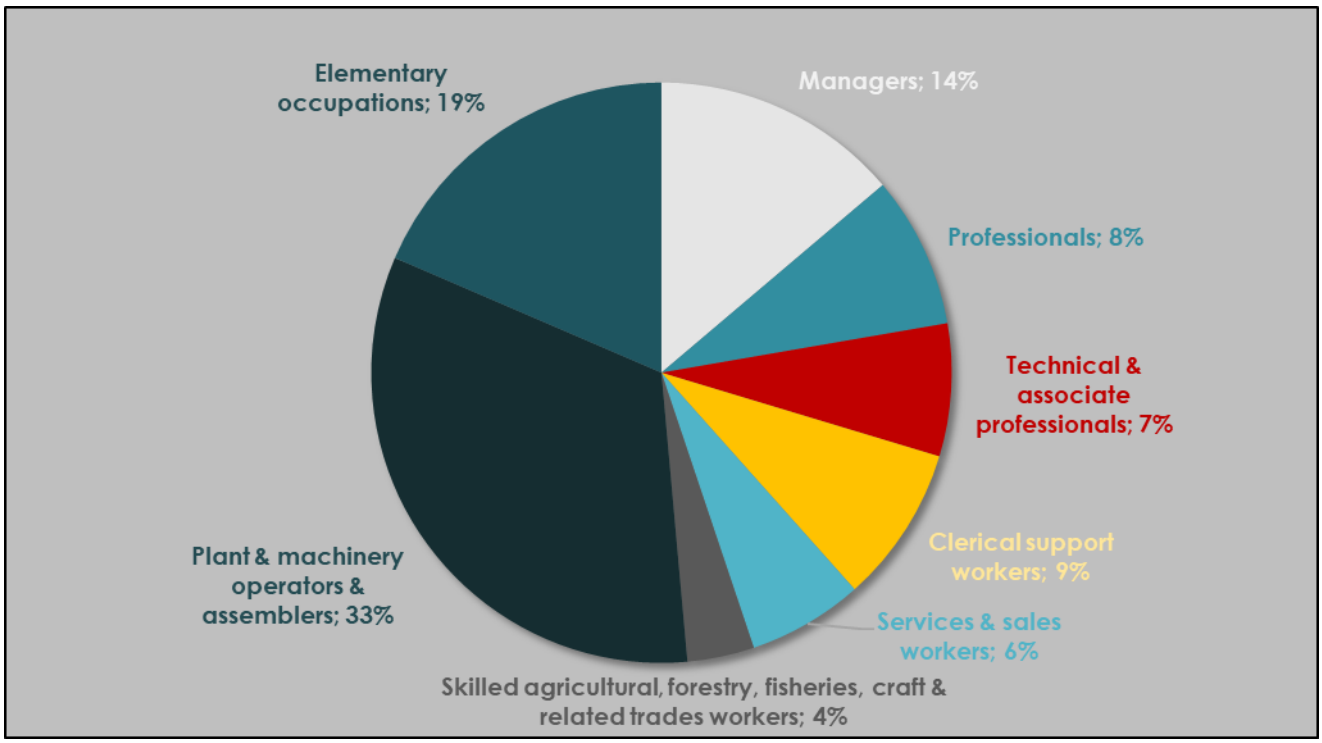

Figure 6-35: Road Freight Business average occupation group distribution

Source: UE 2018

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PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Responding businesses were asked to report on employment trends over the past five years, and to give an indication of what the expected employment trends for the next five years will be. These results are contained in Figure 6-36 and Figure 6-37.

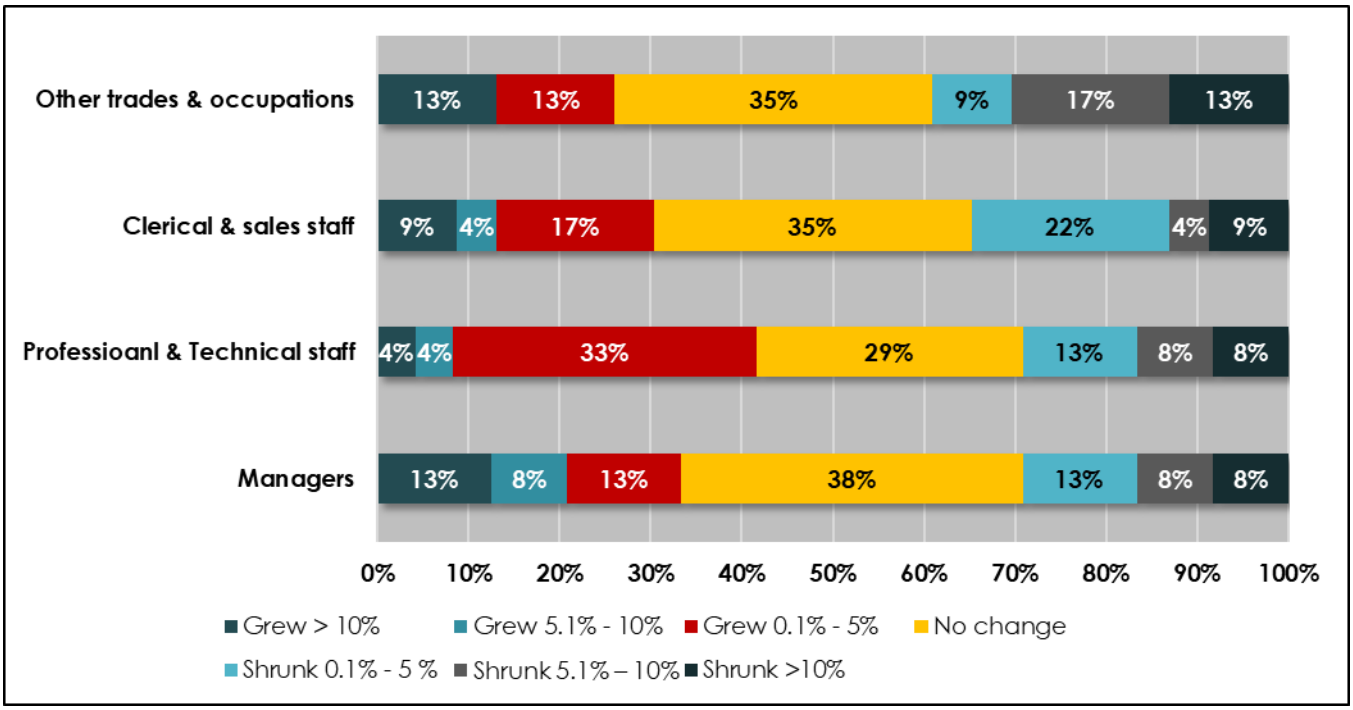

Figure 6-36: Road Freight Businesses employment trends over last 5 years

Source: UE 2018

From the figure above, it is observed that clerical and other trades and occupations experienced greater decline over the last five years (39% and 35% respectively) than managers and professional and technical staff (29% respectively).

Approximately 34% of responding businesses experienced some degree of growth for managerial positions, while 38% reported no change. About 41% indicated growth for professional and technical staff and 29% experienced no change. For clerical and sales staff, 30% of businesses reported growth and 35% reported no change in employment figures. Twenty six percent (26%) of businesses experienced growth for other trades and occupations, while 35% indicated there was no change over the past five years.

Figure 6-37 below reveals that in general, Road Freight businesses are cautiously optimistic about the future employment growth. For most occupation groups the majority of responding businesses believe that there will be no change in employment numbers.

Responding businesses, in general, are less optimistic about growth in managerial positions compared to the other occupation groups. Other trades and occupations are anticipated to grow the most, with 41% of businesses foreseeing an increase in the number of individuals employed.

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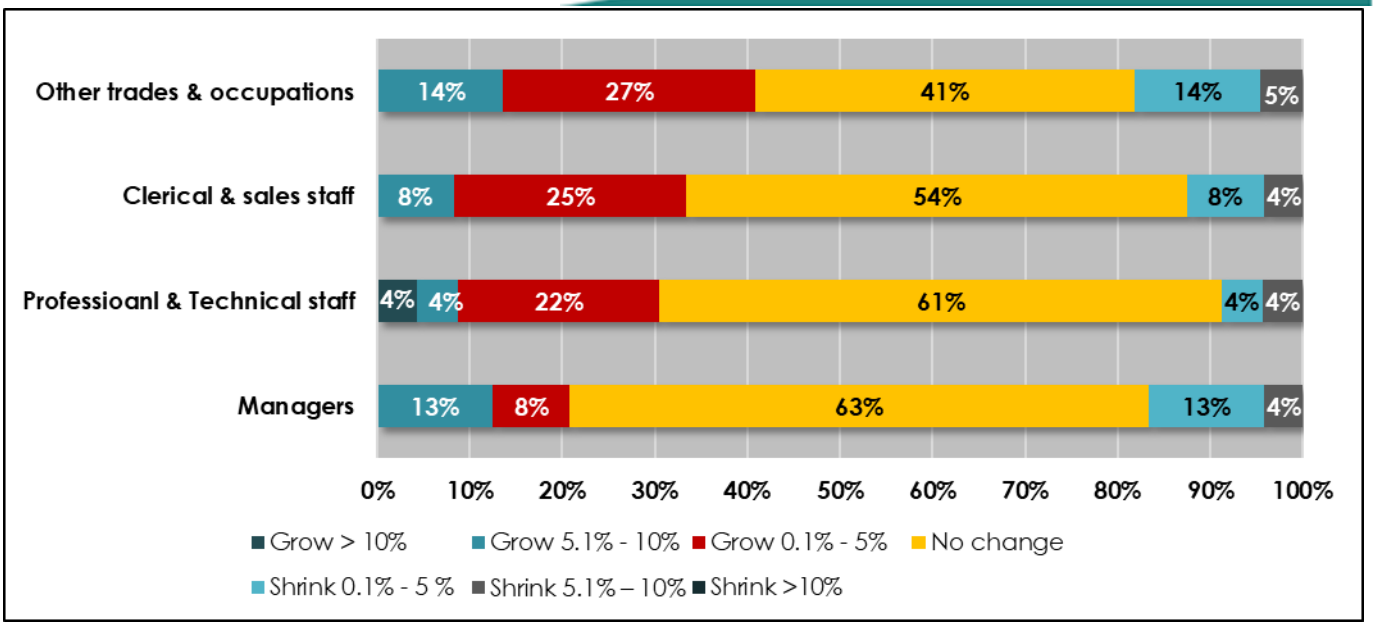

Figure 6-37: Road Freight Business anticipated employment trends for the next 5 years

Source: UE 2018

ROLE PLAYERS

There are a number of role players that impact the Road Freight sub-sector, and this includes statutory or authority bodies, industry associations or representative bodies, labour unions and representatives, and a number of other entities that have an indirect but crucial role in the workings of the sub-sector.

Some of the other state departments or body associations identified in the stakeholder engagements as having an impact on the Road Freight industry's skills development viability is TETA; the National Skills Authority; regional municipalities, with Ekurhuleni coming up as key; the Department of Labour as far funding is concerned for learnerships and MOU/MOA development; the Department of Trade and Industry (DTI) in terms of B-BBEE Codes of Good Practice. Other industry associations during the interviews identified the relevance of other SETAs' relationship to the Road Freight sector, such as those that the Bargaining Council (NBCRFLI) pays levies to, the Wholesale and Retail Sector Education and Training Authority (W&RSETA), the Health and Welfare Sector Education and Training Authority (HWSETA), and the Manufacturing Engineering and Related Services (MerSETA).

The role of a legislative or regulatory environment in the economic growth and skills development of the sector were brought up as significant in the following issues:

- The bureaucracy around funding and grants results in the malfunction of many SETAs, in particular where discretionary grants are concerned.
    - Business Unity of SA (BUSA) challenged the previous structure grant and funding structure, since employers were not seeing the benefits of their investments.
- TETA's system is not user-friendly or effective; monies cannot always be accessed and are not attributed to the relevant SETAs as prescribed.
    - Although most companies pay their 1%, a very small number completes their WSP/ATRs.
    - Nobody from TETA approaches the organisations to find out what the SETAs can do to improve their skills development facilitation.
- The B-BBEE Scorecard. These three elements were highlighted as particular concern:
    - The 1st one says an employer can spend 5% of the levy bill; however, this is not possible with the current economic climate. Employers are finding it difficult to meet annual targets, which is more difficult without proper support from funding authorities.

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  - The 2nd element is about disability or people with disabilities (PwD). Employers do not know how to sustain PwD and how to do so without discrimination. The Road Freight business involves many trucking and warehousing related jobs which are not easy fits for PwD. When PwD are given jobs in the above capacities it could seem insensitive or discriminatory in nature. Employers do not know how to work around this and still reach targets according to the B-BBEE Scorecard.
  - The 3rd element is about learnerships and internships. SETAs are trying to offer support from a workplace development experience. The current mandate states that 6-12 months learnerships be extended to permanent employment upon completion. However, this is not always feasible. For example, Imperial Logistics train a large number of learners and it is not reasonable to put all of the learners into employment as prescribed.
- The Transformation Agenda:
  - In terms of black women with or without disability in employment and leadership, equitable transformation is yet to transpire in the sector.
  - Although the BEE Act and IDC are good vehicles to push the transformation agenda, they are not enough for real change to be realised, particularly because the current system is not conducive to implementing *real* change.
- Their legislative environment hinders small businesses from finding success in the industry.
- Compliance issues:
  - In terms of how funds are measured and mandated to be spent, it is not always realistic. Industries cannot always comply to the various laws around the various initiatives because there are not enough enabling causes to complement the objectives of government bodies.
  - Many companies are not interested in real transformation. They stick to the compliance measures and tax laws, and rarely do enough to impact absorption rates or affect real transformative change.

The key role-players in the Road Freight sub-sector as identified through the stakeholder engagements are as follows:

STATUTORY AND AUTHORITY BODIES

- *The Department of Transport (DoT)*
  The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities and other levels of government, regulating through setting norms and standards, and monitoring implementation (National Government, 2018).

- *The Department of Trade and Industry (DTI)*
  The DTI encourages structural transformation in order to create a dynamic industrial and globally competitive economy. It achieves this through the creation of an environment that is conducive to investment, trade and enterprise development which thereby broadens participation in the economy and ultimately strengthens economic development (NBCRFLI, 2015).

- *South African Revenue Services (SARS) – Customs and Excise Department*
  SARS is an organ of state outside the Public Service collecting and administering all national taxes, duties and levies imposed under national legislation, such as the Skills Development Levy (SDL) that is used for employee training and skills development (National Government, 2018).

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *Road Freight Association (RFA)*

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RFA supports its members who are in main road service providers. RFA is a facilitating body and influences state of industry, rates, road infrastructure, road safety, freight security, driver's interests, cross border transport, education, health, etc. (Transport Forum, 2018)

- *South African Express Parcel Association (SAEPA)*
  SAEPA is a non-profit organisation representing the interests of the express parcel transport industry by communicating positions to legislative and regulatory officials and promoting the use of express delivery services (Transport Forum, n.d.).

- *The South African Association of Freight Forwarders (SAAFF)*
  SAAFF liaises closely with many government departments and parastatal institutions, dealing with matters such as customs, port health, trade permits, border controls, export control of perishable products, cargo handling and security at harbour terminals and airports, plant quality, Railway services and Road Freight legislation (Transport Forum, n.d.).

- *The Chartered Institute of Logistics and Transport SA (CILTSA)*
  CILT is the international professional body for Logistics and Transport professionals with Sections in over 30 countries. The SA Section (CILTSA) was established in 2002. CILTSA maintains the professional standing of its members so that they are recognised for their superior ability and expertise to create world-class logistics and transport value (Transport Forum, n.d.).

- *SAPICS – The Association for Supply Chain & Operations Management Professionals*
  SAPICS is a professional knowledge-based Association that enables individuals and organisations to improve business performance (Transport Forum, n.d.).

- *Cross-Border Road Transport Agency (C-BRTA)*
  C-BRTA was formed to regulate cross border transport though law enforcement. It is playing an important role by so doing in terms of promoting economic development in South African Development Community (SADC) by facilitating access to markets at cross border level (Anon., 2016)

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018).

- *National Bargaining Council for the Road Freight and Logistics Industry (NBCRFLI)*
  Governed by the Labour Relations Act of 1995, the NBCRFLI allows for employer and employee organisations to establish a bargaining council for an industry and area. Through collective bargaining, trade unions and employer organisations, which are party to the Council, the NBCRFLI are able to negotiate matters that are of mutual interest to the Road Freight and Logistics Industry (NBCRFLI, 2015).

- National Employers Association of South Africa (NEASA)
  Established in 1996, NEASA provides all *employers* access to affordable top-quality labour law representation and industrial relations services (NEASA, n.d.).

- *Motor Industry Bargaining Council (MIBCO)*

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MIBCO is a Bargaining Council as envisaged in the Labour Relations Act whose mission is to create and maintain industrial peace and stability in the Motor Industry (MIBCO, 2018).

- *Motor Transport Workers Union (MTWU)*
- *Professional Transport & Allied Workers Union (PTAWU)*

OTHER ROLE-PLAYERS

- *SANRAL*
  SANRAL's mandate is to maintain and finance road networks in South Africa (SANRAL, 2018).

- *Arrive Alive*
  Aims to develop an effective road safety information portal to save lives on roads (Arrive Alive, 2018).

- *Department of Labour (DoL)*
  The Department of Labour publishes legislation that regulates labour practices and activities. It plays a significant role in reducing unemployment, poverty and inequality through a set of policies and programmes developed in consultation with social partners (NBCRFLI, 2015).

- *Department of Higher Education (DHET)*
  The Department's mission is to develop capable, well-educated and skilled citizens who can compete in a sustainable, diversified and knowledge-intensive international economy, which meets the development goals of the country. TETA and many other transport related entities report to the DHET (National Government, 2018).

- *Truckers Association of South Africa (TASA)*
  Assists emerging truckers in the road transport sector.

- *Barloworld*
- *UniTrans*
- *Imperial Logistics*
- *APICS - The provider of supply chain, logistics and operations management research*

GROWTH TRENDS

Despite its nature of high costs, safety and regulation issues, and facing traffic congestion, the Road Freight transport sector is fast becoming a major player in the economy. It appears to be a more flexible and speedier alternative to Rail freight transport (WSP, 2018). However, forecasts indicate a surge in demand for freight transport over the next two decades where high volume transport routes will increase at a rapid rate. Thus, the county's economy will come to rely even more on stable transport infrastructure. An upsurge in Road Freight traffic as well as cross-border traffic is estimated to rise to over one million respectively in 2050 (Department of Transport, 2017). The infrastructure and arrangements to handle such heavy traffic volumes is currently vastly inadequate. These projections also suggest that the approach in the future should probably shift from freight traffic to Rail, despite the many benefits road transportation currently offers, such as relative cost-efficiency and point-to-point or door-to-door services. In the long run, higher volume freight would be better suited to Rail traffic given that it progresses to be a competitive segment of transport with respect to efficiency and technology.

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The evolving trends and shifts that were highlighted during the primary research phase emerged under three reoccurring themes, namely technology, transformation and occupations. The trends are thus highlighted under these three themes as follows:

Technology

The Road Freight sector will be affected by advancements in technology and digitisation trends, much like those in the Forwarding & Clearing sector, including:

- Blockchain technology
- Driverless-ness
- E-hailing for driving/transportation and warehousing
- The Internet of Things (IoT) will allow for trucks to be tracked digitally
- Drones which will result in a virtual supply chain
- Robotics which means less man labour, reduced costs, reduced risks
- 3D printing which would change production and distribution
- Eco-friendly systems, such as 3D printing, which is less industrial and hazardous to the environment
- Engine related advancements
- Simulation for training of drivers
- Cameras, surveillance and security have already become prominent within the sector

Transformation/Equity

The Road Freight industry is looking to transform its industry to one that is attractive to the youth and women. This is more imminent since the driver pool is aging and the industry will face a lack of replacement workers. The industry will furthermore undergo a change in terms of skill requirements due to the advancements in technology. However, when looking at transformation with regards to ownership, there are limited women-owned businesses.

Truck drivers earn a relatively good salary, and this is used to lure younger generations into the industry and to make employment attractive and a prospective profession for them. However, the industry is careful about hiring the correct people for the job, since drivers tend to carry large amounts of assets in their freight. The older generation tend to receive more trust in this regard. So, although the industry is looking to transform its age demographics, it gives much care to such appointments.

The industry is also looking to place more female drivers and women in leadership positions. Some organisations are grooming people toward this end but there is much room for improvement. The transformation objectives outlined here can be advanced by the involvement of TETA in such areas.

Projected Economic Performance

The stakeholder engagements revealed that the Road Freight industry's economic performance is likely to be impacted by current technology-related advancements and trends. This was depicted as both positive and negative depending on how the sector responds, as follows,

- E-hailing for driving/transportation and warehousing will result in the increased usage driverless trucks where companies can afford them. Other alternatives to this trend will involve an increase in contracted trucks, outsourced work, and even non-employment in the industry for specific companies who are not unable to keep up with the trends both in infrastructure and financially. This trend will impact on smaller companies as well as big business.
- The IoT allowing for trucks to be tracked on an ongoing basis will likely increase efficiency, productivity and turnaround time between warehouse distribution and customer delivery. The result will be higher profits and customer satisfaction that will expand business in the industry for the companies who get this right.

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- Technology via tablets is already being used for ease of communication and real-time updates. The drivers are taught to use the tablets for briefing and debriefing, communicating estimated time of arrival (ETA), and so forth. Again, the digital age is more demanding on satisfying customers and this adds to the revenue accrued by companies that applies this approach to their operations and services.

Other factors that could have a bearing on the economic performance of the sub-sector include:

- The Transport industry contributes about 8% to the country's GDP, which the stakeholders consider to be a very low margin; the industry often has to 'sweat its assets' to see a good profit. The low margin can be attributed to the Transport industry's tendency to be easily affected by the external environment and macro-economic factors such as those captured in the PESTLE framework, i.e., political, economic, social, technological, environmental and legal factors.
- Fuel and gas increases contribute to the loss of jobs; productivity slows down; freight volumes go down and fewer trucks are then needed, which means fewer drivers are needed, and these end in lay-offs.
- The B-BBEEE Scorecard negatively affects the economic performance of the sector since it adds to an already monopolised industry. The industry is not growing as expected and is currently sitting in a technical recession.
- South Africa does not have a sustainable imports/exports system; it is not adaptive to changing environments and practices and the economy tends to suffer as a result.

KEY CHALLENGES

The need exists to maintain and upgrade South Africa's road infrastructure. A major result of the ailing road infrastructure is because 78% of the network is estimated to be older than it was designed to be. Increased heavy vehicle traffic also affects the condition of the roads, which is already a problem as roads keep deteriorating. In addition, a backlog is building in maintenance and rehabilitation despite a surge in funding and resources to capacitate efforts to upgrade and maintain road systems (PWC, 2013).

The road transport system's inability to handle rising passenger and freight demand comes as a result of less Rail utilisation. There are also demands from the industry for a multi-modal freight model for road-Rail transportation to ensure that both transport forms are optimally used. Along with this, the industry is also encumbered by labour-related issues, an unskilled workforce and growing environmental regulations, which are not being addressed at a fast enough rate (Department of Transport, 2017).

Other challenges likely to affect the economic performance and skills development of the industry identified through the stakeholder engagements include:

- Lack of skills transfers in the sector
- The demands of an increasingly digitally motivated environment
- The modernisation of fleets against current skills and capacity; skills need to be re-engineered to accommodate the growing needs and capabilities of technology advancement
- Road freight transport consumes more energy, and fuel price increases along with e-tolling means that it is fast becoming a very costly mode of business in the sector
- The vulnerability of long-distance truck drivers exposed to crime while travelling. Many are also exposed to sexually-transmitted diseases as they partake in sexual activities while on the road. They never report or uncover their illnesses, until they are too ill to continue working, which leads to sudden job termination.
- International legislations have significant impact on practices within the sub-sectors
- Industry buy-in

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- An aging workforce
- Labour unrests and xenophobia
- Communities blocking roads, strikes and service delivery protests
- The green economy; there is a legislated tax on fuel and carbon emissions in some parts
- Driver safety (cash-in transit heist falls under this Chamber) and the safety of trucks on the road
- Drivers sense of unrest and unhappiness
- Research and Development (R&D) is critical to each sub-sector, but more so for those who are especially involved in supply chain and logistics.
- Finally, the emergence of SMMEs are seen as 'disruptors' in the market. They tend to make an impact but are forced to survive under difficult trading conditions. Part of the reason is that bureaucracy issues limit working relationships between bigger and smaller companies; some bigger conglomerates are simply reluctant to make room for SMMEs. Imperial Logistics have developed a **SINAWE** supplier development fund to help small enterprises. The Youth Employment Service (**YES**) programme, a vehicle instituted by the DTI supports the youth in smaller enterprise development.

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6.3.1.3 TAXI INDUSTRY PROFILE

The following sub-section provides insights into matters not necessarily contained within secondary or official data sources. Extensive primary research has been undertaken which informs aspects of the Taxi industry related to:

- The different role-players active within the Taxi industry, and their respective functions
- Growth trends experienced within the Taxi industry
- Specific challenges faced by the Taxi industry

BUSINESS PROFILE

Surveys were distributed to transport businesses in an effort to gain greater perspective on these businesses. Unfortunately, too few businesses from the Taxi industry responded to make any inferences that would be representative of the industry.

The reason for the lack of participation from the Taxi industry is in large due to the fact that the great majority of Taxi businesses (i.e. mini-bus Taxis), are not formally registered as businesses, and as such, it is very difficult to interact with these businesses in the required manner.

ROLE PLAYERS

The Taxi industry has the least amount of institutional role players in the road transport group, since the industry is still largely unregulated and informal. However, according to the stakeholders engaged, the Taxi business is making strides towards becoming more regulated, unionised and commercially viable.

The industry associations addressed during the primary research process indicate that although there are not many representative bodies for the industry, the sector is not unaffected by regulations and legislations that govern the Road Passenger industry. Some of the issues that affect the Taxi sector include:

- Licensing of Taxis
- Lack of enabling legislation with respect to the industry
- Lack of public passenger subsidies or support
- The fact that operating licenses are granted through the DoT, which delays their operations since tax clearance certificates are granted by SARS
- The industry calls for support from
    - the Ministry of Police for increased security;
    - the Ministry of Minerals and Energy in terms of fuel price fluctuations, as well as operating costs in a market where passenger buses and trains are subsidised. The Taxi industry's fares are limited to the no more than 10% of their markets' income.
    - the Ministry of Finance with respect to subsidies
- TETA could do more to skill workers in the industry, and aid managerial and leadership interventions

The key role-players identified through the stakeholder engagements for the Taxi sub-sector are as follows:

STATUTORY AND AUTHORITY BODIES

- *The Department of Transport (DoT)*
  The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities

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and other levels of government, regulating through setting norms and standards, and monitoring implementation (South African Government, 2018).

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *South African National Taxi Council (SANTACO)*
  Founded in 2001, SANTACO serves as an umbrella body governing and acts as the principal mouthpiece for Taxi industry (Transport Forum, n.d.).

- *National Taxi Alliance (NTA)*
  NTA is a Taxi association. Its objective is to promote and defend its members for economic and social inclusion into the mainstream economy of SA (National Taxi Alliance, 2017).

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018).

OTHER ROLE PLAYERS

- *SANRAL*
  SANRAL's mandate is to maintain and finance road networks in South Africa (SANRAL, 2018).

- *Arrive Alive*

Aims to develop an effective road safety information portal to save lives on roads (Arrive Alive, 2018).

- *Suppliers of vehicles (Toyota and Nissan)*
- *Taxi Scrapping Administrator (TSA)*
- *Taxi Finance Houses (Taxi SA and SA Taxi)*
- *Taxi insurance companies (VUM and Scottfin)*
- *Department of Transport*
- *TOPICA*

GROWTH TRENDS

The Taxi industry is present everywhere and is a key component of the country's passenger transportation. It has become a 'formalised' structure in an informal industry over the years but is very much still considered an informal and unregulated economy. However, the industry is increasingly becoming well-regulated by internal structures, with its most common regulator being Taxi associations (as discussed previously).

Economically, the Taxi industry has a stimulating effect on the national economy. There are estimated to be more than 200 000 Taxis on the SA's roads, and each Taxi creates about 2 new jobs related to the industry (SA Taxi, 2018).

The evolving trends and shifts that were highlighted during the stakeholder engagements in the Taxi industry is characterised by three reoccurring themes, namely technology, transformation and projected economic performance:

Technology

- Free Wi-Fi at Taxi ranks are becoming commonplace, with some Taxis equipped with Wi-Fi on board.

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- Technology is fast penetrating the industry with more IT-related skills needed at administrative and management level.
- Apps are also being developed for the industry, which will involve such activities as those that allow operators to monitor drivers through live tracking; communicating information to commuters about queue lengths at ranks; notifying commuters of Taxis in their vicinity; and cashless solutions such as in-app paying, Zapper, PayFast, and SnapScan, amongst others.
- Smart cards that will make use of tap-and-go paying services are also on the horizon.

Transformation

- Not much has been said about transformation in the Taxi industry; however, there are talks to develop cooperative banking as a financial services institution for the industry. A cooperative banking institution will provide participants in the industry access to centralised and automated operations. It will also address skills issues, improve governance and management, and bring the Taxi industry into mainstream financial activity (Ujuh, 2018). The industry is looking to transform itself towards following more formalised approach, and this is how it begins that process. Addressing issues in the national transformation agenda will follow, it is hoped.

Projected economic performance

- E-hailing services were expected to have a major impact on the mini-bus Taxi sector, however its greatest impact is on metered Taxis. The metered Taxi sector is remarkably smaller than the mini-bus sector, and only operates around airports and Gautrain stations, serving a more affluent market. Thus, the presence of e-hailing services which is app-based is a quicker and more convenient way for people to book and catch lift services. An expected downgrade in profits is expected for metered Taxis in the coming years, until its absolution, possibly. At present, the Taxi industry is not economically impacted by new passenger transportation services. Taxis currently still provide cheaper services to most of the public transport market. However, it should adapt to the changing environment to ensure economic viability in the long term.
- While Uber and Taxify boost car sales for the economy, it is believed that this will not be sustainable in the long run as the current road infrastructure does not cater to the rising number of cars on the road. People will be forced to make use of public transport again when "highways become parking lots" due to heavy congestion.
- Modal integration could positively impact the industry since it will work alongside other key passenger transportation services instead of in silos and in competition against everyone.

KEY CHALLENGES

The core objective of the Taxi industry is to ensure that the vast majority of South Africans get to and from their destinations at a relatively low cost. The public transport system in SA is a huge industry and supports the development and sustainability of the working classes and smaller businesses, and it is through these dynamics where the Taxi industry runs into a number of challenges.

The challenges that the Taxi industry faces include the following:

- Taxis not entitled to subsidies compared to other modes of passenger transportation.
- Drivers work long hours
    - Not being subsidised plays a role here since two drivers should be assigned to a Taxi, but this is unaffordable – particularly for long-distance routes
- Increasing congestion on the roads will impact the turnaround times of Taxi trips.

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- Without better road infrastructure and consideration of all the players in the passenger transport system, the efficiency of the Taxi industry will suffer.

- The ongoing Taxi violence across the country gives it a heavily negative connotation. People are less likely to make use of its services when they fear their safety and their lives are at threat since shootouts are occurring more commonly.
- Lack of education and knowledge plays a role in the Taxi industry's violence and intolerance towards different groups of people and against the evolving environment.
- Driver behaviour and driver license fraud resulting in unlawful use of the road and high incident occurrences.
    - Drivers lack an awareness of sharing roads with other uses, sensitivity and safety.
- The increasing price of fuel, levies and tolls will turn out to be costlier for passengers and Taxi fares increase to keep up with the demands of the economy. In the future, Taxi fare prices will likely compete with those of e-hailing services, which could lead to the demise of its popularity.
- The Taxi Recapitalisation Programme (TRP) is coming to an end. The procurement of a new contractor is underway; however, new specifications stipulate that at least 40% of the work must be done by the Taxi industry.
    - The previous intervention aimed to have safer, more effective, affordable and accessible Taxi operations. Taxi drivers tend to hold onto their Taxis even if they are no longer safe or roadworthy. The Taxis are their livelihoods and if not on the road, they lose money. Moreover, the money they receive for scrapping is not enough to by a new Taxi.
    - It is important that the essence of the safety requirements and other enforcements are not lost in the process.
- At present, it was revealed that the BRT systems have both positive and negative effects on the Taxi industry. For those Taxi operators that have been incorporated as shareholders and/or that have been absorbed as bus drivers, the BRT has had a positive effect. However, there are those that feel that the BRT are negatively affecting their business as they feel they have less clients and thus their business is reduced (South African Cities Network, 2016).

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6.3.2. RAIL TRANSPORT STATUS QUO

Figure 6-38: Rail Transport sub-sector breakdown

The status quo section describes the status of the Rail Transport industry. The section defines the Rail mode of transport, and gives insight into its networks and passenger and freight volumes. The section also gives an overview of the Rail industry's economic activities and GVA/GDP contribution. These major sections are followed by a profile of the industry where its business profile, role-players, growth trends and key challenges are described. The profile section is informed by the various primary research collected through online surveys and stakeholder engagements conducted in the three major economic provinces in the country (for greater detail on the primary data collection, please refer to Section 2: Research Approach).

RAIL TRANSPORT DEFINITION

The Rail transport industry can be described as the movement of freight and passengers by way of vehicles running on and guided by fixed Rail tracks.

Worldwide, passenger Rail services fulfil two main functions, namely regional, long-distance transport linking cities and rural areas with one another; or daily movement of suburban commuters to and from work. Freight Rail services involve the movement of various types of goods and commodities using freight wagons specifically designed for the various types of goods. This includes the transport of dry bulk, liquid bulk, break bulk (bags, cartons, crates, parcels, etc.), containers; and unitised goods (pallets, bulk bags, etc.). This includes commodities such as road vehicles, fuel, agricultural produce and fertilisers, minerals such as coal, chrome and manganese, and consolidated consignments.
South Africa has an extensive Rail network that covers large parts of the country, linking cities and the various ports and also connecting with the Rail networks of other countries in sub-Saharan Africa.

RAILWAY NETWORKS AND VOLUMES (PASSENGER & FREIGHT)

South Africa's Rail network, at present, is ranked eleventh largest in the world at approximately 22 387 route-km or 30 400 track-km. It comprises 12 801km of national network, 7 278km of branch lines and 2 228km of narrow-gauge urban network, as well as 80km of standard gauge regional rapid transit network (Department of Transport, 2017b). Cape Town, eThekwini and Gauteng have larger-scale urban Rail networks compared to the rest of the country.

The Rail network is managed by the Department of Public Enterprises via Transnet SOC Ltd. Transnet Freight Rail (TFR), the largest division of Transnet SOC Ltd, is the largest Railroad and heavy haulier in Southern Africa, with about 21, 000km of Rail network, of which about 1, 500km are heavy haul lines (Transnet, 2017, 2012). Additionally, TRF maintains an extensive Rail network across South Africa that connects with local ports and other Rail networks in the sub-Saharan region, with its Rail infrastructure representing about 80% of Africa's total (Transnet, 2012).

Passenger Rail transport is managed by the SOE Passenger Rail Agency of South Africa (PRASA[12]), which is responsible for most passenger Rail services in the country. Around 2 million people travel by train every

[12] PRASA consists of four branches: Metrorail, which operates commuter rail services in urban areas; Shosholoza Meyl, which operates regional and intercity rail services; Autopax, which operates regional and intercity coach services; and Intersite, which manages the property owned by PRASA.

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day in South Africa (PRASA, 2016). The existing Rail network is currently being upgraded to take advantage of the new coaches' technological features. The former Minister of Transport Joseph Maswanganyi announced in 2017 that there was R173 billion investment towards the modernisation of South Africa's Railway system (Parliament, 2017). Improved passenger safety and energy efficiency are critical components of the modernisation programme and part of PRASA's mandate.

Rail transport in the Pretoria-Johannesburg area entered a new era in 2011 with the opening of the Gautrain Rapid Rail Link managed by the Gautrain Management Agency and implemented by the Gauteng Department of Roads and Transport (Gauteng Department of Roads and Transport, 2017). The project serves the Gauteng area with a rapid transport service, providing a safe, efficient and reliable service to both commuters and airport travellers.

The volumes of freight and passengers for Rail transport give an indication of the demand for such services. The demand figures for both freight and passenger Rail transport are described below, in accordance with the *Statistics SA P7162 Statistical Release: Land Transport* from 2013 to 2017.

Table 6-13: Rail transport volumes and passengers

Rail transport	2013	2014	2015	2016	2017	Annual growth
Freight (Volumes '000 tonnes)	215 615	224 374	223 444	219 367	229 831	**2 771**
Passengers (Journeys '000 persons)	542 999	528 564	475 120	394 439	319 621	**-54 610**

Source: Stats SA, 2014; 2015; 2016; 2017; 2018

Since 2013, the volumes of freight transported via Rail increased by approximately 14 million tonnes, from 215 million tonnes in 2013 to 229 million tonnes in 2017. The average annual growth is calculated at approximately 2,8 million tonnes per year over the five-year period in question.

Passenger journeys has seen a major decrease of approximately 223 million persons from approximately 542 million in 2013 to 320 million in 2017. This translates to an average decrease of approximately 55 million passengers/journeys per year from 2013 to 2017.

ECONOMIC CONTRIBUTION

As explained under section 6.1, Rail transport falls together with road transport under 'land transport, transport via pipelines', and as such, no disaggregated economic data for the Rail industry exist.

GVA and employment contribution for the Rail industry can therefore not be presented. The *Statistics SA P7162 Statistical Release: Land Transport* provides some insights on the national income derived from Rail freight and Road Passenger enterprises (Stats SA, 2018). These are set out in Table 6-14 below:

Table 6-14: Rail transport income for freight and passengers (current prices)

Rail transport	2013	2014	2015	2016	2017
Freight (Income Rand 'million)	33 146	36 478	37 208	37 843	42 270
Passengers (Income Rand 'million)	2 844	3 090	3 042	2 936	2 729
Total	**35 990**	**39 568**	**40 250**	**40 779**	**44 999**

Source: Stats SA, 2014; 2015; 2016; 2017; 2018

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From the table it is revealed that Rail freight dominates, with 94% of income from Rail derived from freight, with only about 6% derived from passengers.

As was the case with road transport, the GVA and employment figures of land transport and transport via pipelines can give an indication of the economic performance of the Rail transport industry. For an overview of GVA and employment contribution of land transport and transport via pipelines, please refer to section 6.1.

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6.3.2.1 RAIL PROFILE

In order to profile the Rail industry, extensive primary research was undertaken. Insights gained informed specific aspects of the Rail Industry related to:

- The profile of Rail businesses
- The different role-players active within the Rail industry, and their respective functions
- Growth trends experienced within the Rail industry
- Specific challenges faced by the Rail industry

BUSINESS PROFILE

Results gained from the surveys conducted (please refer to ***Section 2.2***) provides focussed insights into the different Chambers and the business environment evident.

Insights into Rail businesses, as derived from responding Rail businesses, are discussed according to the following aspects:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

Business size in this context refers to the number of people employed. Businesses are classified as follows:

- Small: Business employing no more than 49 people
- Medium: Businesses employing between 50 and 149 people
- Large: Businesses employing 150 or more people

All the responding Rail businesses are classified as large.

GEOGRAPHIC DISTRIBUTION

Responding businesses were asked to indicate their head office location. All of the responding businesses indicated that the head office is located in Gauteng.

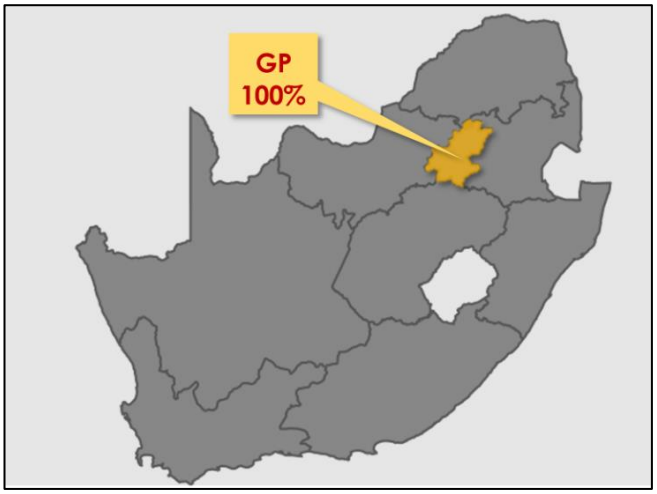

Figure 6-39: Geographic distribution for Rail Businesses (head office)

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EMPLOYMENT PROFILE

Responding businesses were asked to estimate the number of employees per occupation according to the OFO Major Groups. These results are illustrated as percentage distribution across the occupation groups in Figure 6-40 below.

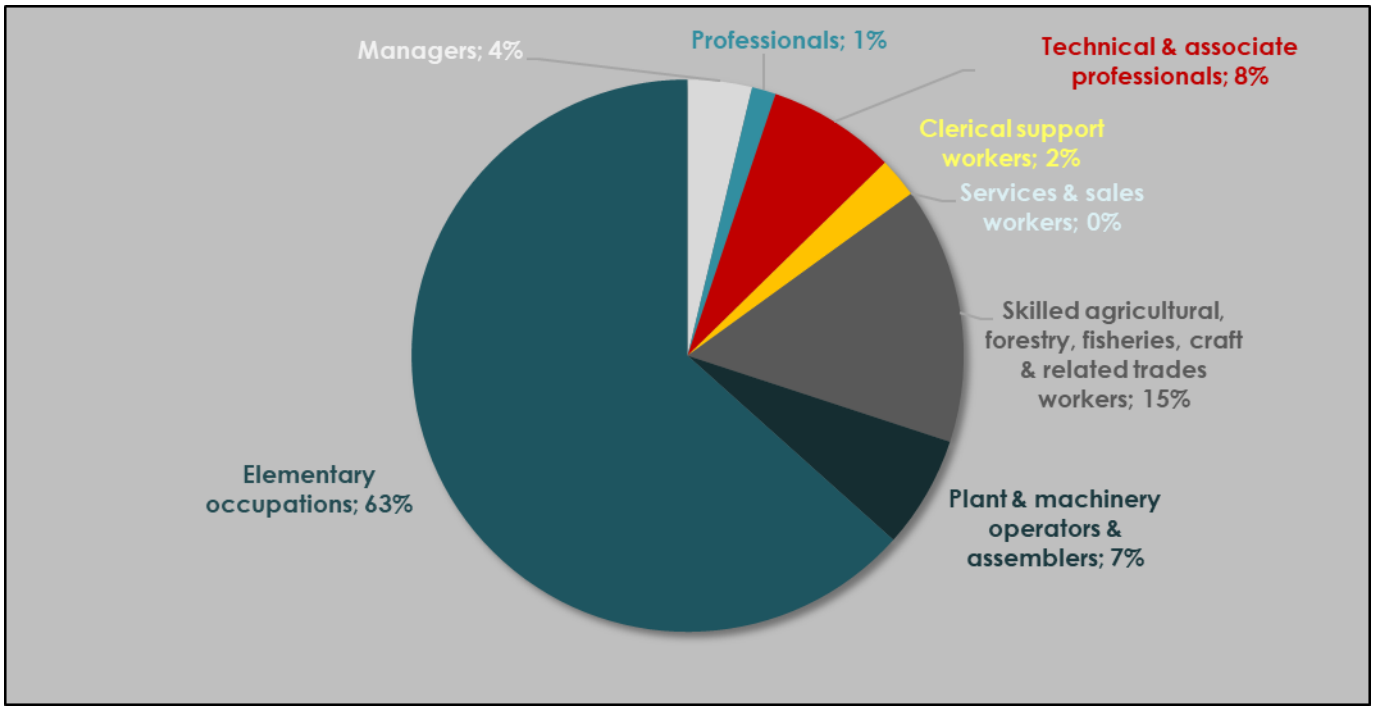

Figure 6-40: Rail Business average occupation distribution

Source: UE 2018

According to responding Rail businesses, elementary occupations dominate the industry, consisting of 63% of all employees. Skilled agricultural, forestry, fisheries, craft and related trades workers hold the second most employees (15%), followed by technical and associate professionals (8%). Plant and machinery operators make up about 7% of employees, managers 4%, clerical support workers 2% and professionals only 1%.

PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Responding Rail businesses were asked to reflect on the past five years and provide an indication of how each employment group faired over the last five years in terms of growth. Responding businesses indicated that employment declined for managers, clerical & sales staff and other trades and occupations, while professionals experienced no change. This is illustrated in Figure 6-41 below:

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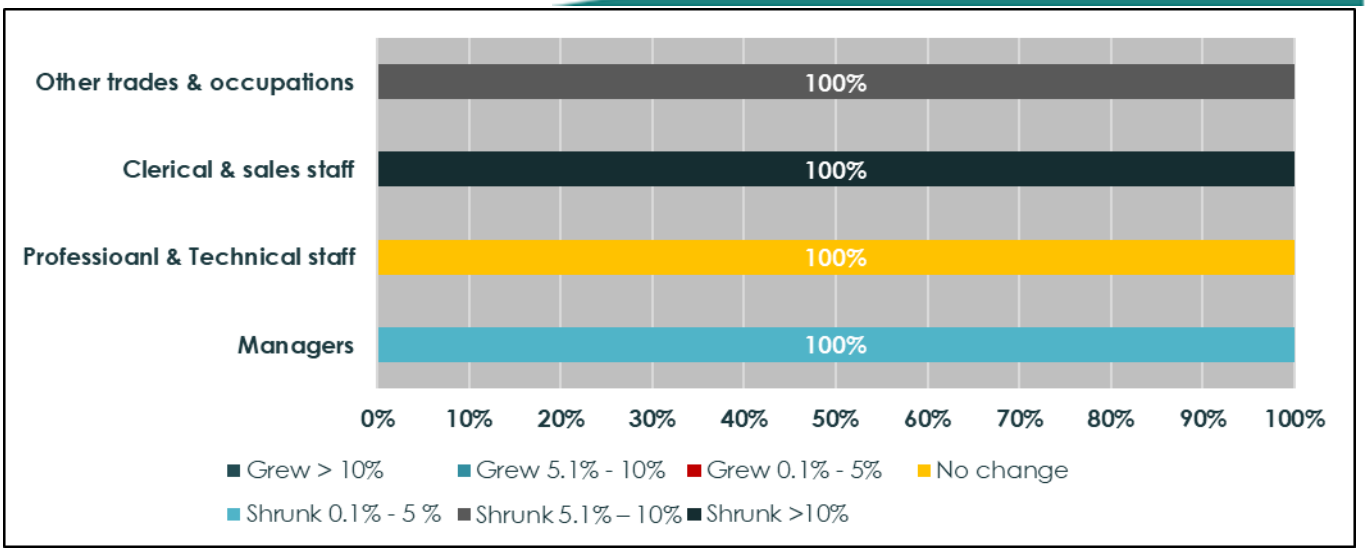

Figure 6-41: Rail Business employment trends over last 5 years

Source: UE 2018

When asked to indicate the anticipated employment growth for the next five years, responding businesses indicated that managerial positions, professional and technical staff and clerical & sales staff should see no change, while other trades & occupations are anticipated to grow with more than 10%. This is illustrated in Figure 6-42 below:

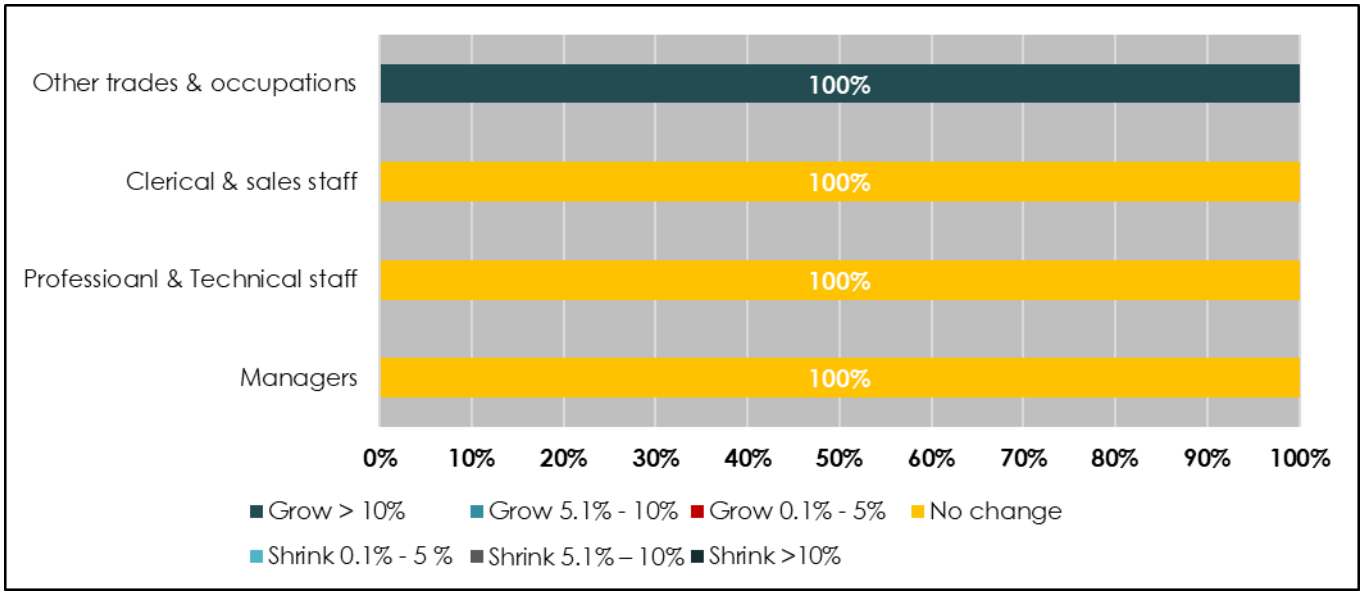

Figure 6-42: Rail Business anticipated employment trends for the next 5 years

Source: UE 2018

ROLE PLAYERS

There are a number of role-players that impact the Rail transport sub-sector, and this includes statutory or authority bodies, industry associations or representative bodies, labour unions and representatives, and a number of other entities that have an indirect but crucial role in the economic and skills development activities of the sub-sector.

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The key role-players identified through the stakeholder engagements for the Rail sub-sector consist of both passenger and freight transport. Where a distinction occurs, it will be noted as such. The Rail sub-sector's biggest employers are state-owned enterprises, PRASA and Transnet. Bombela (Gautrain) is also considered one of the biggest employers but is not state-owned. The stakeholders who were interviewed cited the ministries of education, both basic and higher departments, as having an influential role in the skills development trajectory of the Rail industry.

Further, it is important for South Africa to upgrade the mathematics, science and technology curriculums taught in primary and secondary school. It has been observed that trainees find it difficult to cope with the demanding nature of technical and engineering aspect of the Rail industry. Quality assurance bodies such as the Council on Higher Education (CHE), UMALUSI Council for Quality Assurance in General and Further Education and Training, Quality Council for Trades and Occupations (QCTO), and TETA could all play a leading role in ensuring that what is taught at school level is in line with the demands of the industry and where it is heading, with particular regard to the 4th Industrial Revolution (4IR). This agenda could probably be furthered with the new bill that the Railway Safety Regulator (RSR) wants to pass. It is believed that the new bill will endow the Regulator with more control and active participation responsibilities in the licensing and accreditation of training programmes in the Rail sub-sector.

The major role-players in the Rail transport industry include the following:

STATUTORY AND AUTHORITY BODIES

- *Passenger Rail Agency of South Africa (PRASA)*
  PRASA is a state-owned enterprise responsible for most passenger Rail services in the country, and consists of four branches, namely MetroRail, Shosholoza Meyl, Autopax and Intersite (National Government, 2018).

- *Railway Safety Regulator (RSR)*
  The RSR oversees and promotes safe Railway operations through support, monitoring and enforcement guided by an enabling regulatory framework (National Government, 2018).

- *Engineering Council of South Africa (ECSA)*
  ECSA is a statutory body established in terms of the Engineering Profession Act (EPA), 46 of 2000. Its core functions are the accreditation of engineering programmes, registration of persons as professionals in specified categories, and the regulation of the practice of registered persons (ECSA, n.d.).

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *Railroad Association of South Africa (RRA)*
  RRA lobbies relevant stakeholders for independent, sound, objective and technical information to enable decision makers to make sound decisions regarding the environmental impact of transport (Transport Forum, 2018).

- *Transnet*
  Formed in 1990, Transnet is the custodian of ports, Rail and pipelines in the country and operates as an integrated public freight transport company. Transnet is made up of five complementary operating divisions, namely Transnet freight Rail, Transnet Rail engineering, Transnet national ports authority, Transnet port terminals, and Transnet pipelines (Transnet, n.d.).

  Transnet Freight Rail (TFR)

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The TFR is a heavy haul freight Rail company that has approximately 25 000 employees spread throughout the country. The company is active in 17 countries and its Rail networks in the sub-Saharan region represents about 80% of Africa's Rail infrastructure (Transnet, n.d.).

- *Institution of Railway Signal Engineers (IRSE)*
- *South African Railway Association (SARA)*
- *General Electric (GE)*
- *International Heavy Haul Association (IHHA)*
- *South African Electronic Communications Association (SAECA)*

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018).

- *National Union of Metalworkers of South Africa (NUMSA)*
  Formed in 1987, NUMSA is the biggest metalworkers trade union in South Africa affiliated with the following sectors: engineering, motor, auto/tyre, and electronics (NUMSA, 2013).

- United National Transport Union *(UNTU)*
  UNTU is one of the largest unions in the Transport industry. UNTU is a non-profit organization (NPO) and is affiliated with the Federation of Unions of South Africa (FEDUSA), the second largest national Trade Union centre in South Africa (UNTU, 2018).

- *Transport and Logistics Employers Association (TLEA)*
- *Solidarity/Solidariteit*

OTHER ROLE PLAYERS

- *The Transnet School of Engineering, Koedoespoort*
- *Transnet School of Rail, Esselenpark*
- *All Chamber Committee members [vague]*
- *Locomotive industries such as China North Rail (CNR) and China South Rail (CSR) that recently merged to form CRR Corporation*

GROWTH TRENDS

South Africa has the most extensive Rail network in the continent. Presently, the continued boost of investment into the sector promises to revitalise SA's Rail system as well as increasing its Rail capacity. Capital investments from financial institutions and local and international funders into the country's Rail systems are part of ongoing and future development schemes. Projects include boosting national freight volumes with particular interest in key mining industries such as iron ore and coal. This funding is also geared toward re-balancing the Rail/road transport sector. In 2013, 71% of freight in SA was moved by road even though Railways make up to 80% of infrastructure.

A shift from road to Rail freight will significantly decrease logistical costs and carbon emissions since Rail transport is the most environmentally friendly compared to the other modes of transport. Toward this end, the National Infrastructure Plan (NIP) aims to greatly improve the Rail corridor between key industrial centres: Gauteng and Durban, by 2020 at least (Grey, 2015). Moreover, a significant amount of investment

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is going into skills and development training as major players in the industry are looking to bolster the South African Rail industry to the fifth largest in the world in coming years.

The evolving trends and shifts that were highlighted during the primary research phase in the Rail sub-sector for both passenger and freight is characterised by three reoccurring themes, namely technology, transformation and projected economic performance:

Technology

- The 4.0 strategy or the Transnet strategy
  - It is linked to the 4IR wave, meaning that major players in the Rail sector, like Transnet, are moving towards introducing more digitalised training and skills development. The strategy is currently in the infant stage and looking for funding since it is an expensive endeavour.
  - The current dominant occupations in the industry (call operations, train drivers, engineers, technicians and artisans) will be impacted in the way they do things, which demands that they adapt and re-skill in order to comply to the new environment.
- Automation, which will demand workers in the sector to be reskilled in order to become multi-skilled. However, the roll-out of this in SA will be informed by the priorities of government with respect to various aspects, such as job creation, for example.
- A move towards online activities, such as tracking of consignments, quotations, etc.

Transformation

The Rail industry is a highly safety regulated environment and this means rapid change of occupations and skills are not likely to happen. The same goes for prescribing to the transformation agenda. It is very difficult and sensitive to employ PwD in the sector, for example.

Projected Economic Performance

The stakeholders engaged agree that the Rail sector's contribution to the transport industry has significantly decreased in recent years. The sector faces competition from the road transport industry due to a variety of factors; among them, the failure to invest towards Rail infrastructure; the failure to appoint the right people with the right skills; and the failure to identify priority future skills for the sector.

However, there is some optimism too. Growth is foreseen for the sub-sector due to the roll-out of SIPs or the development and revitalisation of operating lines and corridors, as well as the expansion of commuter trains as suburban and intercity demand for passenger movement grows. The performance of the Rail growth path until 2023 is projected at 3.1% growth rate, with a stretch target of 300 million tons of freight moved for 2018/19.

Other factors that have a bearing on the economic performance of the sub-sector include:

- Major players in the freight Rail sector are looking to expand their brand and operations beyond the SADC region to secure a higher market share in freight or cargo volumes. This will not only reinvigorate the sector, but it will create more jobs, and tackle issues such as poverty.
- The development of a road-to-Rail initiative looks to create a one-stop Rail freight service, which should re-open the land transportation market to Rail services. Whether this will negatively impact on the Road Freight sector is difficult to say; however, there is space for both road and Rail operations as well as expansion.
- Government level decisions and implementable policies are necessary to direct the sector and to source investments into Rail and Rail infrastructure.

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- The public and private sector should integrate to ensure that Rail infrastructure development responds to the needs of the future. For example, linkages between north and south corridors cannot be established without significant investments.
- Both freight and passenger Rail require improvements with respect to availability, reliability and safety, if the sector wishes to grow its contribution to the economy.

KEY CHALLENGES

In an age where the world is increasingly turning to technology to advance its economic and industrial productivity, South Africa's Rail transport sector has more to consider than just the need to upgrade its ageing infrastructure or to circumvent continued labour strikes. According to recent studies, the South African Rail sector faces systemic shortcomings as its biggest challenge. These shortcomings have caused the sector to become fragmented. The state of a fragmented Rail industry has resulted in an increased usage of road transport systems as an alternative to Rail transportation; low Rail asset utilisation, empty Railroads, reduced schedules, and not enough available capital to replenish its infrastructure or to plan for investments. The shortcomings inhibiting the Rail sector from realising true efficiency is attributed to:

- No independent mechanisms for transparent operations and Rail freight rate pricing,
- Rigid management and costing practices,
- Poor communication platforms, and
- Outdated or legacy processes.

These attributes collectively inhibit freight that is viable to be moved by Rail because of poor access to the Rail network. Moreover, the absence of predictability when it comes to scheduling impacts business planning (Coetzee, 2018; WSP, 2018; Department of Transport, 2017). Businesses looking for efficiency and predictability are substituting transport by Rail for transport by road. Amidst a changing industry, the Rail sector in SA is faced with the dual challenge of keeping up with shifting trends and holding onto its share of the transport market in order to remain relevant and competitive.

The challenges that are likely to affect the economic performance and skills development of the Rail freight and passenger sector identified through the stakeholder engagements, include:

- An aging fleet that is outdated and not efficient.
- The introduction of technology in the sector will create a need for up-skilling and reskilling of train drivers and other related occupations in the industry to support new operation of trains, i.e., signalling, maintenance, planning, logistics and so forth.
    - Particular consideration in how digitisation in the sector will be rolled out and made accessible is necessary. For example, data in SA is expansive and to equip every worker with a device for transmission will be costly.
- Change of regulations within the industry, which looks to channel a significant proportion of control to the regulators, particularly where licensing and accreditation of skills programmes are concerned. This will likely have expensive repercussions for training institutions.
- An aging workforce that find it difficult to adapt to evolving trends.
    - A balance has to be established between the current workforce and the emerging, "millennial" one. There is an obvious generational gap when it comes to training and the two groups find it difficult to connect in terms of how the training is conducted or the type of training provided.
- Costs of emissions. SA, on tier 2, is behind the international benchmark of tier 3 and 4.
- The continuing need for mass rapid Rail systems.
- An increasing demand for fail-safe systems.
- Change management will become crucial in the sector.
- The industry too reliant on markets, which is volatile and not sustainable.

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- Lack of industry agility.
- Trains being damaged by commuters (especially an increase in trains being burned).
- Safety for train drivers.
- Overall security issue for commuters – this is a contributing factor for commuters opting to use other modes of transport other than trains.
- Limited opportunities for SMMEs to enter this industry.

6.3.3. AIR TRANSPORT STATUS QUO

The status quo section describes the status of the Air Transport industry. The section defines the air or Aerospace mode of transport; it gives insight into its networks and passenger and freight volumes. The section also gives an overview of the Aerospace industry's economic activities and GVA/GDP contribution. These major sections are followed by a profile of the industry where its business profile, role players, growth trends and key challenges are described. The profile section is informed by the various primary research collected through online surveys and stakeholder engagements conducted in the three major economic provinces in the country.

Figure 6-43: Air Transport sub-sector breakdown

AIR TRANSPORT DEFINITION

Aviation transport involves the moving of goods and passengers by air. The aviation industry caters for both cargo and passenger transport and includes military activities, scheduled flights, charter flights, business operated aircraft and recreational flying. For the purposes of this analysis, focus is placed on scheduled air transport activities for both cargo and passengers.

South Africa has a well-established aviation industry and network, providing world-class international airports in the major cities of the country, as well as a significant number of smaller airports throughout the country. Furthermore, a variety of domestic airlines fly to the main economic centres, as well as a number of smaller destinations. A significant number of international airlines also frequent South African international airports, providing linkages to almost any country in the world.

AIRLINE NETWORKS AND VOLUMES (PASSENGER & FREIGHT)

The SOE Airports Company of South Africa (ACSA) is responsible for managing the country's airports and improving productivity of its airports. The major international airports include the O.R. Tambo International (Johannesburg), Cape Town International (Cape Town) and the King Shaka International (Durban) (ACSA, 2017). The smaller airports are domestic airports, which include Port Elizabeth, East London, George, Kimberley, Upington, Bloemfontein and Pilanesberg. According to the Department of Transport (2016), the country's 10 airports handle more than 98% of commercial traffic, with 200 000 aircraft landings and 10 million departing passengers annually. For example, the O.R. Tambo International Airport is estimated to have 8,9 million departing passengers and 105 700 arriving air traffic movements, followed by the Cape Town International Airport with 3, 7 million departing passengers and 45 600 arriving air traffic movements (ACSA, 2018).

In terms of airline, the SAA is considered one of the largest air carriers in Africa. It flies to 38 destinations worldwide (serving 26 destinations across the African continent) from its hub at the O.R. Tambo International Airport and is the largest of South Africa's airlines (Business Tech, 2015).

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Globally, transporting goods by air account for an estimate of 35% of all global trade value (ACSA, 2017). Locally however, air transport is not playing a significant role in the freight transport arena, with air cargo transported representing only around 0,3% compared to the total volumes transported locally in South Africa.

During 2017, the total **air cargo** that was processed through the O.R. Tambo International gateway was 394 million tonnes. This amount has increased by approximately 18 million tonnes from 2016 (ACSA, 2017).

The following table gives an overview of the number of passengers travelling air for the last five years:

Table 6-15: Number of departing passengers via air in South Africa

Departing passengers	2013	2014	2015	2016	2017	Annual average passenger growth
International	4 914 163	5 116 779	5 198 086	5 360 767	5 680 282	144 475
Domestic	11 963 082	11 701 577	12 036 117	13 401 807	13 692 647	327 486
Regional	487 569	518 989	531 211	540 530	565 804	14 730
Unscheduled	73 072	81 838	79 136	71 225	63 228	-2 084
Total	**17 437 886**	**17 419 183**	**17 844 550**	**19 374 329**	**20 001 961**	**484 606**

Source: ACSA, 2017

From the table above, it is clear domestic flights carry the most passengers, making up 68% of all departing passengers via air. The total number of passengers that departed from an airport in South Africa in 2017 added up to more than 20 million. Over the last five years, the number of passengers has grown on average by about 484 606 per year since 2013.

ECONOMIC CONTRIBUTION

The following table gives a break-down of the air transport industry and its contribution towards the transport and storage sub-sector GVA and employment contribution.

Table 6-16: Contribution of Air Transport to the Economy, 2016

Aviation transport	GVA (Rand 'million)	GVA contribution to sector	Contribution to National GVA	Employment	Employment contribution to sector	Contribution to national Employment
Air Transport	**R 19 055**	**100%**	**0,5%**	**35 298**	**100%**	**0,2%**
Transport & storage sub-sector	R 319 033	6%	8%	689 449	5%	5%
Transport, storage & communication sector	R 389 178	5%	10%	833 550	4%	4%

Source: Quantec 2018

From the table, it is evident that the air transport industry contributed a total of R19 billion towards the national GVA in 2016. The majority of the GVA was derived from passenger transport. The air transport contributes approximately 6% towards the transport and storage sub-sector and is responsible for only about 0,5% of the national GVA. Compared to the road and Rail transport industries, the contribution of air transport to GVA is limited.

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The aviation industry as a whole contributes some 5% to employment in the transport and storage sub-sector. Approximately 4% of jobs in the Transport, Storage and Communications sector are derived from air transport. The contribution of this industry to national employment is very limited, with only 0.2% of all jobs in South Africa being in air transport.

The following figure illustrates the provincial GVA share for air transport, to give some perspective on where air transport is dominant within our country.

From Figure 6-44, it is clear that Gauteng accounts for the majority of air transport GVA at approximately 62%, outnumbering all other provinces combined. This, however, is not surprising considering that Gauteng boasts the busiest and biggest airport in Africa, O.R. Tambo International Airport (Jackson, 2012). The other two provinces with a substantial share are Western Cape (15%) and Kwazulu-Natal (11%). These provinces are often tourist destinations, and as such their proportional share is also to be expected.

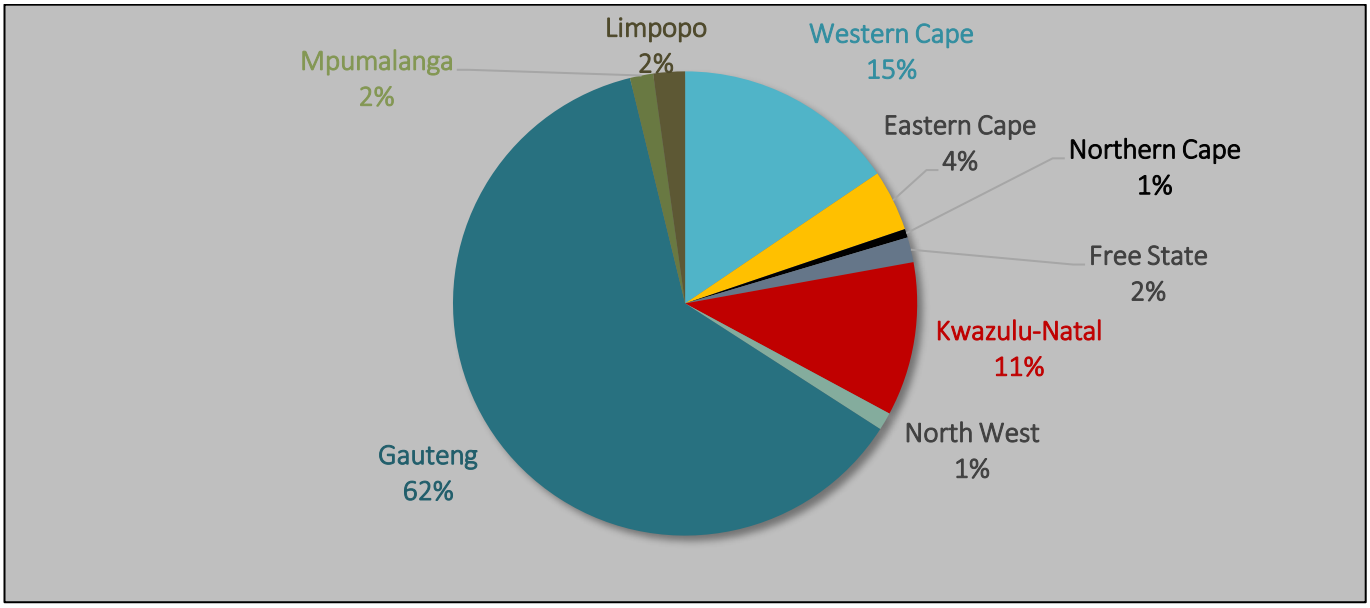

Figure 6-44: Provincial Contribution to Transport Sector by Air Transport, 2016

Source: Quantec 2018

Figure 6-45 below gives a breakdown of the employment share. Approximately 53% of the air transport labour force consists of formal employment. A total of 29% are semi-skilled, 18% are skilled and 6% are low skilled. Approximately 47% of the air transport labour force consists of informal employment.

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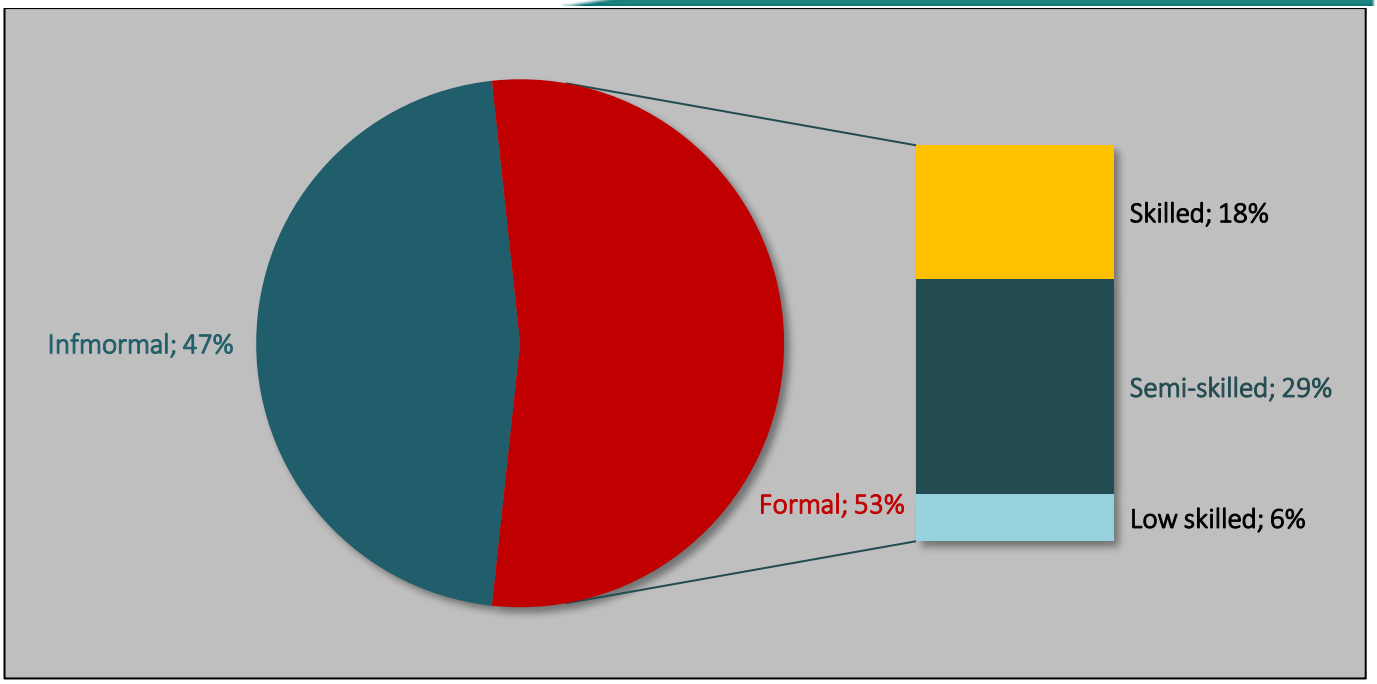

Figure 6-45: Air transport employment share, 2016

Source: Quantec 2018

The table below gives the provincial share of land transport and pipeline transport, which clearly highlights the fact that Gauteng holds the greatest share of employment.

Table 6-17: Provincial share of employment for air transport

Province	Formal		Informal		Total	
Western Cape	2 780	15%	2 290	14%	5 070	14%
Eastern Cape	559	3%	658	4%	1 217	3%
Northern Cape	80	0%	80	0%	160	0%
Free State	238	1%	389	2%	627	2%
KwaZulu-Natal	1 372	7%	1 193	7%	2 565	7%
North West	144	1%	431	3%	575	2%
Gauteng	12 986	69%	10 243	62%	23 229	66%
Mpumalanga	278	1%	419	3%	697	2%
Limpopo	416	2%	742	5%	1 158	3%
Total	**18 853**	**100%**	**16 445**	**100%**	**35 298**	**100%**

Source: Quantec 2018

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6.3.3.1 AEROSPACE PROFILE

The following sub-section provides insights into matters not necessarily contained within secondary or official data sources. Extensive primary research has been undertaken which informs aspects of the Aerospace Chamber related to:

- The profile of Aerospace businesses
- The different role-players active within the Aerospace industry, and their respective functions
- Growth trends experienced within the Aerospace industry
- Specific challenges faced by the Aerospace industry

BUSINESS PROFILE

Surveys were distributed to transport businesses to form a greater understanding of the dynamics of transport businesses (please refer to ***Section 2 Research Approach***

The results for businesses that fall within the Aerospace Chamber are discussed according to the following aspects to provide greater insights:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

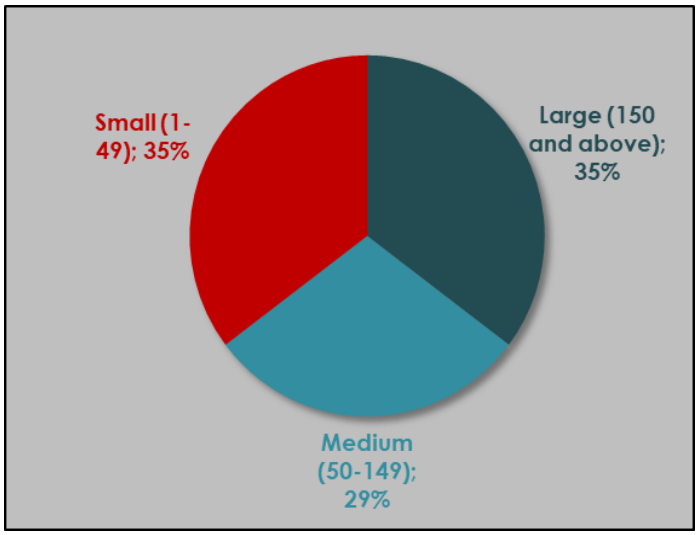

Figure 6-46: Aerospace Business Size

Responding businesses were classified according to the number of people employed. Approximately 35% of responding businesses employ 1 to 49 people (small), 29% employ 50 to 149 people (medium) and 35% employ 150 or more people. These results are illustrated in Figure 6-46.

GEOGRAPHIC DISTRIBUTION

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The survey results revealed the location of the head offices of Aerospace businesses. Approximately 71% of responding businesses have head offices in Gauteng, followed by 12% in Mpumalanga. Approximately 6% of responding businesses have head offices in Limpopo, Free State and the Eastern Cape, respectively.

Further investigation shows that approximately 83% of large, 20% of medium and 100% of small Aerospace businesses are located in Gauteng.

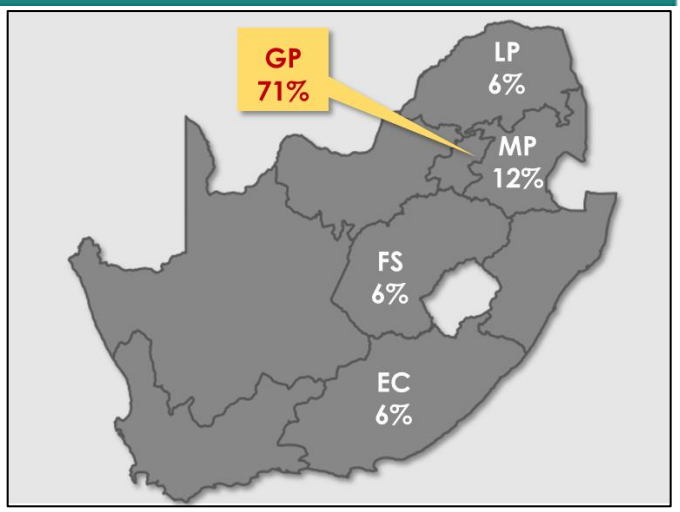

Figure 6-47: Geographic distribution for Aerospace Businesses (head office)

EMPLOYMENT PROFILE

Responding businesses were asked to indicate the number of estimated employees per occupation according to the OFO Major Groups. These results are illustrated as percentage distribution across the occupation groups in Figure 6-48.

The greatest concentration of Aerospace employees falls within the technical and associate professional category (30%), followed by professionals (22%). Clerical support workers, plant and machinery operators and assemblers and elementary occupations each hold 11% of employees, and managers and service and sales workers each hold 6%. Skilled agricultural, forestry, fisheries, craft and related trades workers only hold 3%.

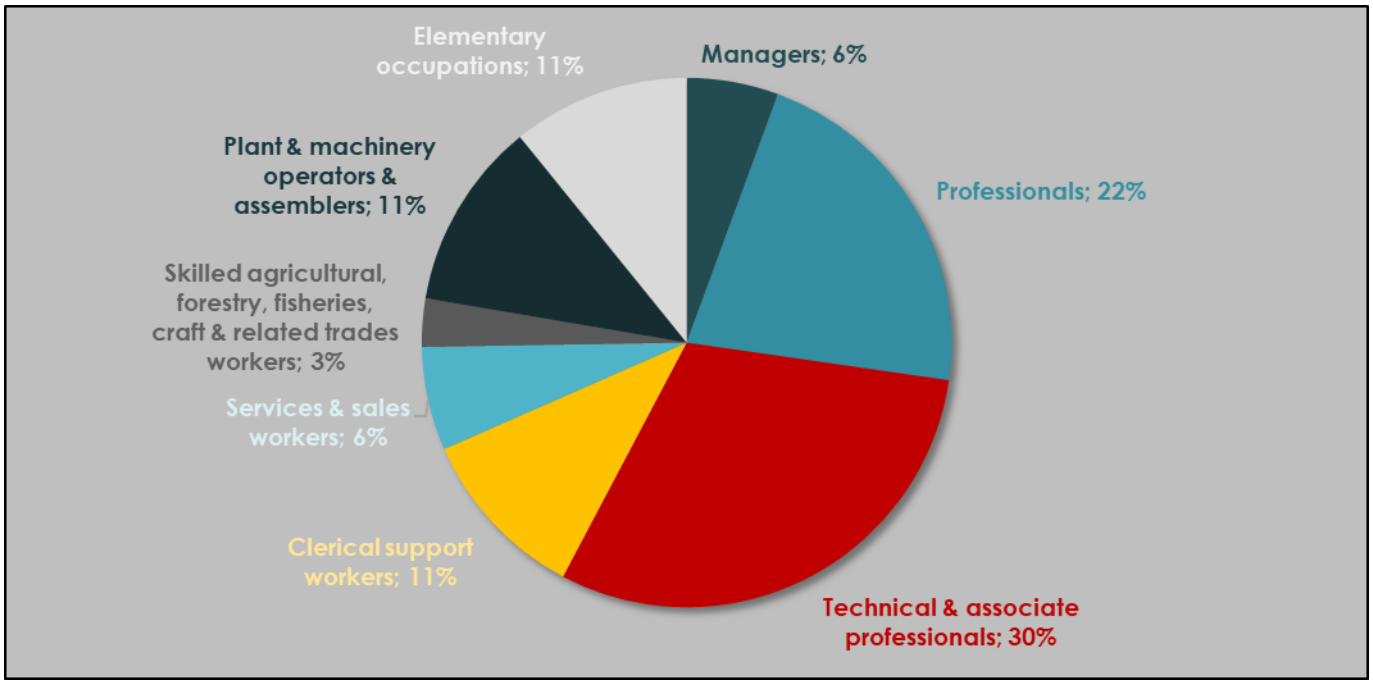

Figure 6-48: Aerospace Business average occupation group distribution

Source: UE 2018

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PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Responding Aerospace businesses were asked to reflect on the past five years and provide an indication of the growth experienced for each employment group over the last five years. This is illustrated in the figure below:

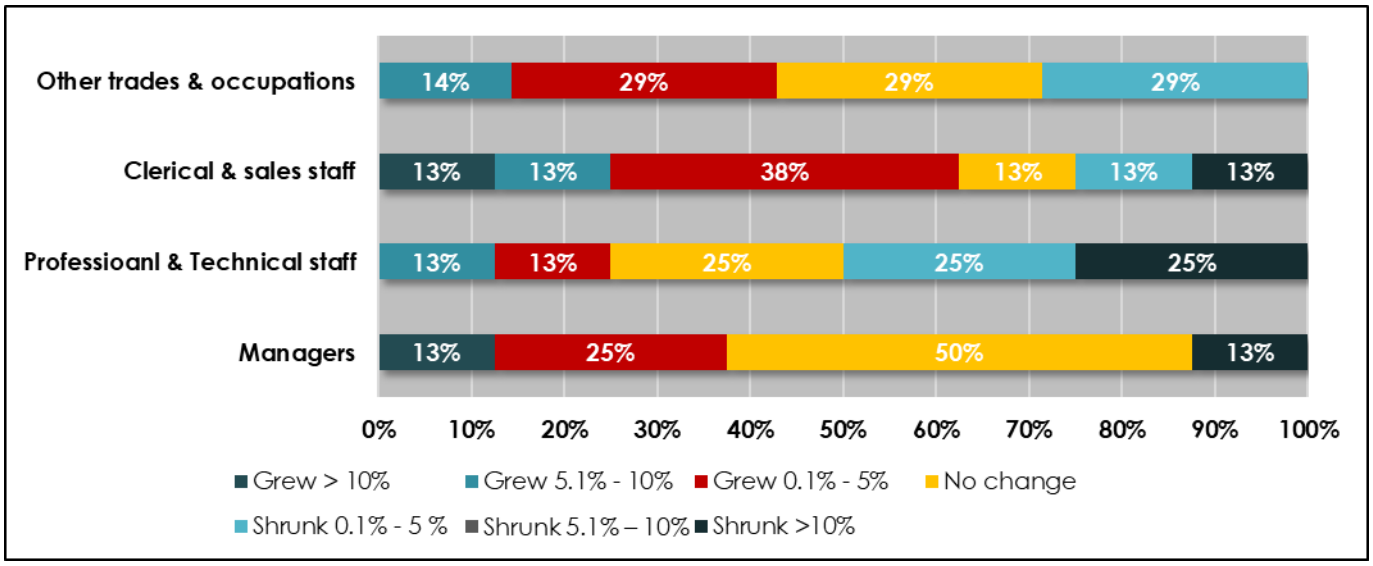

Figure 6-49: Aerospace Business employment trends over last 5 years

Source: UE 2018

The occupation that reportedly experienced the most growth is clerical sales and report staff, while professional and technical occupations experienced the least growth, with approximately half of responding businesses reporting a decline in employment over the last five years. Managerial positions remained constant for half of the responding businesses, while 38% of businesses saw the number of managers increase.

When asked to give an indication of the expected growth for the next five years, the following results, as illustrated below, were gained:

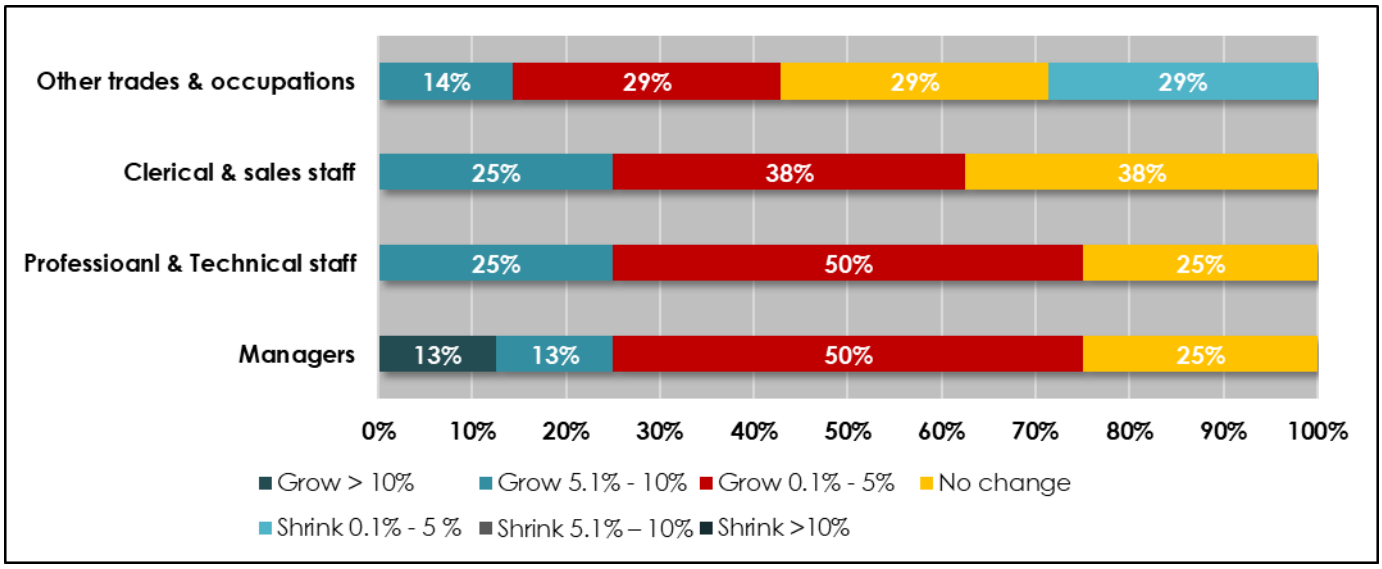

Figure 6-50: Aerospace Business anticipated employment trends for the next 5 years

Source: UE 2018

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Approximately three quarters of responding businesses anticipate employment growth for managers and professional and technical staff. Approximately 63% of businesses believe clerical and sales staff will grow, while just less than 58% foresee other trades and businesses will decline.

ROLE-PLAYERS

A number of role-players have a bearing on the Aerospace transport sub-sector, comprising both government parastatals, non-government organisations, training institutions, and aviation agencies. There are also a significant number of peripheral entities that may also indirectly have a bearing on the sector, its economic activities and skills development agenda.

During the stakeholder engagements it was established that representation in the industry is skewed in favour of bigger organisations versus smaller or more specialised companies. The skewed representation influences Chamber committees and the issues that are addressed and prioritised. There seems to be a lack of representation in the engineering side of the industry too, and as a result this segment is not well-organised. There is also little to no representation for pilots, cabin crews or air staff on board committees. This could mean that the needs of these constituencies are not met or are properly developed, particularly in terms of skills development and training. If nobody knows where the strengths and weakness are with air staff, particularly cabin crews and pilots, it cannot be expected that the appropriate measures are instituted to continue or improve upon the good, or to correct the weaknesses.

Similar to other sub-sectors, the B-BBEE Scorecard requirements are a challenge for the Aerospace sub-sector too. The transformation agenda is not satisfied insofar as the placement of black pilots. A lot of this is due to the fact that it is expensive to obtain a commercial pilots' licence (CPL), with the price range anywhere between R600 000 and R1 000 000, which is not affordable for most people, more so for people considered previously disadvantaged.

Another issue is that the CPL does not guarantee employability. A CPL holder only has 200 flight hours, while airlines require an Air Transport Pilots' Licence (ATPL), the highest level of aircraft pilot certificate issued to a pilot that has accumulated at least 1500 flight hours. Young black pilots, it is found, do not always have the opportunity to achieve the highest amount of certification, or flight hours. This impedes on the number of transformative placements within the industry. Industry and education authority bodies have not figured out how to deal with this yet.

The key role-players in the Aerospace sub-sector are as follows:

STATUTORY AND AUTHORITY BODIES

- *South African Civil Aviation Authority (SACAA)*
  SACAA is mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry (Anon., 2016)

- *Air Services Licensing Council (ASLC)*
  The ASLC is responsible for overseeing complaints of non-compliance and for issuing air services licences to new applicants, ensuring the safety and reliability of air services operated within South Africa (Comair Limited, n.d.).

- *International Civil Aviation Organisation (ICAO)*

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- *Independent Communications Authority of South Africa (ICASA)*
  ICASA's strategic objectives are linked to the government outcomes-based approach, which is to ensure that all South Africans have access to a wide range of high-quality communication services (National Government, 2018).

- *International Air Transport Association (IATA)*
  IATA is the trade association for the world's airlines. It represents 290 airlines or 82% of total air traffic (IATA, 2018).

- *Health Professions Council of South Africa (HPCSA)*
  - Aviation Healthcare Assistance Course
  - Aviation Health Care Provider Course

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *Airports Company South Africa (ACSA)*
  ACSA owns the nine airports in SA. ACSA aims to provide safe and secure services and infrastructure for passengers and airlines to transport people and goods. It plans to achieve this through infrastructure improvements (Anon., 2016)

- *Airlines Association of South Africa (AASA)*
  Formed in 1970, AASA represents the mutual interests of its members, which are all airlines based in countries in the global South. Association members include infrastructure service providers, oil companies, major aircraft manufacturers, ground handling companies, service providers, and other industry associations and partners (AASA, 2018).

- *Air Traffic and Navigation Services (ATNS)*
  The ATNS provides air traffic, navigation, training and associated services within South Africa and a large part of the Southern Indian and Atlantic Ocean. The ATNS is responsible for air traffic control in approximately 10% of the world's airspace (National Government, 2018).

- *South African Airways (SAA)*
  SAA's core business is the provision of passenger airline and cargo transport services together with related services, which are provided through SAA and its four wholly owned subsidiaries: SAA Technical; Mango, its low-cost carrier; Air Chefs, the catering entity of SAA; and South African Travel Centre (South African Government, 2018).

- *South African Airways Technical (SAAT)*
  SAAT is the sole technical and maintenance provider to SAA, Mango and ComAir (South African Airways, 2018)

- *Business Aviation Association for Southern Africa (BAASA)*
  BAASA aims to serve, promote, watch and protect the interest of the general and commercial aviation industry. It also serves as a link between the industry and government (Sky Guide, 2018)

LABOUR REPRESENTATIVES/UNIONS

- *Aviation Union of South Africa (AUSA)*

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AUSA strives to be the single union in aviation with members possessing skills and professionalism. It promotes the right to work, associate, collective bargain, withhold labour, protection and develop (AUSA, 2010).

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers' standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018).

- *National Union of Metalworkers of South Africa (NUMSA)*
  Formed in 1987, NUMSA is the biggest metalworkers trade union in South Africa affiliated with the following sectors, engineering, motor, auto/tyre, and electronics (NUMSA, 2013).

- *UASA (labour union for crew members)*
  The UASA is a membership-driven association of trade unions with over 80 000 members and incorporates 34 different trade unions. The UASA is registered with the DoL and represents workers in the following industries: minerals and mining, metal and engineering, transport, agriculture, communication, sport and recreation, and media and catering services (UASA, 2016).

- *South African Airways Pilots Association (SAAPA)*
- *Air Line Pilots' Association South Africa (ALPA-SA)*
- *Solidarity/Solidariteit*

OTHER ROLE-PLAYERS

- *Department of Labour*
  The Department of Labour publishes legislation that regulates labour practices and activities. It plays a significant role in reducing unemployment, poverty and inequality through a set of policies and programmes developed in consultation with social partners (NBCRFLI, 2015).

- *The Department of Transport (DoT)*
  The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities and other levels of government, regulating through setting norms and standards, and monitoring implementation (National Government, 2018).

- *The Department of Trade and Industry (DTI)*
  The DTI encourages structural transformation in order to create a dynamic industrial and globally competitive economy. It achieves this through the creation of an environment that is conducive to investment, trade and enterprise development which thereby broadens participation in the economy and ultimately strengthens economic development (NBCRFLI, 2015).

- *TVET Colleges*
- *National Aerospace Centre (NAC)*
- *Specialist Schools (Rhodesfield High School)*
- *Local and provincial government (infrastructure)*
- *Maintenance, Repair and Overhaul (MRO) maintenance organisations - South African Airways Technical (SAAT)*
- *Airlines as employers*

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South Africa's Air transport network is the strongest in Africa. It continues to be a critical link for the country's international trade, foreign direct investment and tourism. It is estimated that the industry contributed about 7.4 billion USD valued added gross to SA's GDP. The Air transport industry supports approximately 3.5% of the country's GDP and provided at least 70 000 people with employment in 2014. In addition, by buying products and services from local suppliers, the Air transport sector supported a further 130 000 jobs in 2014 (IATA, 2016).

The evolving trends and shifts that were highlighted during the primary research phase in the Aerospace sub-sector is characterised by three reoccurring themes, namely, technology, transformation and projected economic performance:

Technology

Technology is closely interlinked to the aviation industry. The industry is constantly on the lookout for opportunities to advance efficiency and increase turnover rates, and technology plays a key role in achieving those outcomes. For example, Comair in 2012 introduced a reservation and billing system to pick up where profit leakages were. The trends impacting the technology space in the sector include the following:

- Artificial Intelligence (AI) and automation or pilotless aircraft
- Emergence of analytics, coding and possibly robotics in the industry
- Drone technology
- The Fourth Industrial Revolution (4IR) and digitisation
    - People may choose not to travel due to the comfort and convenience of virtual conference programmes and virtual conference centres.
- The evolution of energy and fuel emissions in the form of Green energy and biofuel technology

Transformation

The biggest determinant of change in the sector will come out of the PESTLE framework of change drivers, namely political, economic, social, technological, legal and environmental.

Projected Economic Performance

The economic aspect of the Aerospace sector is not easy to quantify, since the sector covers everything that has to do with making air transport possible, not just the transporting of goods and people by air. It involves building, manufacturing, engineering and maintenance of aircraft; it comprises air traffic control, support and infrastructure of airports and runways, as well as the flying aspect. The Aerospace sector is thus the more expensive service to make use of and to maintain.

That said, according to IATA statistics referred to during a stakeholder engagement, SA is positioned as an important international destination due to the exchange rate. The industry has shown tremendous growth in terms of international flights, inbound and outbound. The market shows slow but steady growth domestically as the middle to high income group grows. The following factors are considered to be future determinants of the sector's economic performance:

- The focus towards integrating air-Rail-road in travel which will allow the booking of one ticket instead three to commute using all three modes of transport. Leading international airlines have already adopted this service. A Gautrain and airlines collaboration are also eminent.
- The shift in attitude towards air travel in SA will have a positive impact as more passengers will make use of the transport system, increasing turnover for airlines. The growing middle class is the main contributor to this trend.

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- Legislation, regulation and how the economy performs will always have an impact on its performance.
- International carriers emerging from the Middle East are proving to be fierce competition for most airlines.
- The economic agreements and collaborations between SA and China, however, will ensure steady growth for the industry amidst competition from the East.
- The proposal for a bullet train between Johannesburg and Durban, and other similar alternative transportation methods and routes will pose a threat to the economy of the Aerospace industry.
- Tourism will continue to positively influence the sector.
- The potential of untapped infrastructure in rural areas in the country.

KEY CHALLENGES

The challenges facing SA's Air transport system are the same challenges facing the industry at the global level. The priority areas include safety, security, infrastructure, sustainability and efficiency. Technology and innovation are at the forefront for challenges that most air networks are facing today and in the near future. The requirement is to adapt to evolving methods and ways of transportation by air to make it safer, more secure, to improve its infrastructure and thereby rendering the air transport industry sustainable and efficient. Some of the processes involved in achieving these objectives include:

- Modernising cargo distribution by introducing digital cargo, for example;
- Introducing a standardised electronic language and platform; in other words, digitisation of the supply chain to allow information to be shared instantly and to simplify the transportation process;
- Capitalising on e-Commerce to strengthen the link between air transport capability and profitability;
- Optimisation of end-to-end journeys (IATA Annual Review, 2018).

These global processes influence the challenges that are likely to impact the economic performance and skills development of the South African Aerospace sector. Some of these are identified through the stakeholder engagements as follows:

- The technological advancements and other change drivers noted here will not necessary translate into brand new skills; instead, upskilling is required. However, upskilling is hampered by what is known as "knowledge drain":
    - The workforce is aging and there is no knowledge management process in place to ensure that the expertise and knowledge are not lost but carried over.
    - Skills and labour are also lost from SA due to the uptake from international companies.
    - The Aerospace sector needs a mentoring council or professional body to provide ongoing mentoring to those in training.
    - Leading institutions, the South African Air Force (SAAF) and Denel, do not produce the same amount and calibre of pilots and technicians. There is no perceived threat driving the production of top pilots and aeronautical engineers. There are a number of reasons for this, key amongst them is that aviation institutions are under-resourced.
    - It is a challenge to get apprenticeships signed off. There is a lack of relevantly skilled personnel to sign off on certificates for technical positions and trades.
- Political instability is a major challenge for the Aerospace sector. Stable and sound policies attract foreign direct investment (FDI), whereas political instability, rigorous and onerous rules/policies, and crime scare off investors and business.
- The SAA being linked with gross corruption and mismanagement is highly problematic since it's a national brand and does not reflect positively on the aviation industry of the country. This mostly affects smaller carriers.

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- The ever-growing high costs of fuel prices and aviation operation. The industry is very sensitive to the rand-dollar exchange rate. The maximum profit margin for a carrier is about 5% against the amount of input and investment put into the business.
- The oversupply of CPLs or commercial pilots in the industry, while ATPLs are required:
    - It is estimated that the industry needs an additional 1 000 to 2 000 new pilots at ATPL level in the next 12-15 years.
    - Passenger jet aircraft carriers (Comair, SAA, Safair, Mango) require pilots with at least 1 500 flight hours.
    - The timing is an important consideration too. To not have an oversupply of ATPLs in the near future, the transition from CPL to ATPL certification has to be steady to accommodate all qualified pilots and not render them unable to find employment. Therefore, programmes put in place should be designed with a long-term plan, not to just cater to immediate demands.
- There is no specialised aviation school or academy where the complete value chain can obtain skills and qualifications. If instituted, this can have a positive influence on the economic outlook of the country as it would ensure the continuous production of skilled and certified workers in the Aerospace sector.
    - Specialised vocation schools will also bridge the ten-year gap (leap time) for pilots between primary certification as a pilot to being a trained and competent pilot-in-command employable in air carrier services.

Transformation within the Aerospace sector is also very slow. It was estimated that less than 20 black women hold ATPLs in South Africa – this is estimated to be less than 1% of all ATPL holders.

Above all else, change is the norm in the industry. Political, social and security influences from across the world have a bearing on the policies and regulations that govern the Aerospace sector. This is encompassed in the VUCA framework, known as the current world climate of volatility, uncertainty, complexity and ambiguity. This climate demands that the industry is agile and resilient in the face of change. It should also be dynamic enough to employ diversification strategies where and when necessary.

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6.3.4. WATER TRANSPORT STATUS QUO

The status quo section describes the status of the Water Transport industry. The section defines the water or Maritime mode of transport; it gives insight into its port and shipping networks and passenger and freight volumes. The section further gives an overview of the Water Transport industry's economic activities and GVA/GDP contribution. These major sections are followed by a profile of the Maritime sub-sector where its business profile, role-players, growth trends and key challenges are described. The profile section (6.4.4) is informed by the various primary research collected through online surveys and stakeholder engagements conducted in the three major economic provinces in the country.

WATER TRANSPORT DEFINITION

Figure 6-51: Water Transport sub-sector breakdown

The traditional definition of Maritime transport involves the shipment of goods and people by vessel on either sea or other waterways. Maritime transport of goods includes the transport of containers, passenger and other vehicles, general cargo that is loose-packed (break-bulk), bulk goods in the form of single-commodities such as minerals and grains, and the bulk transport of liquids such as oil. This includes both liner vessels operating on fixed routes and to fixed schedules, as well as charter vessels that are commissioned on demand.

Passenger transport by sea involves transport by ocean liner, ferry and cruise ships, offering round-the-world cruises; repositioning cruises that offer cruises from one home-port to another destination; and area-based or destination cruises, where the ship undertakes cruises within the area of the home-port and returns to the home-port at the end of the cruise.

South Africa is an important player in world sea trade in cargo, with major shipping lines passing along the coastline of the country. South Africa is also of particular importance as a gateway for Maritime cargo to the SADC region. South Africa does not have any navigable inland water ways.

HRDCSA (2014) states that **98%** of South Africa's total trade is carried by ships, which translates into about 13, 000 ship calls handling trade through ports, employing about 60, 000 seafarers. South Africa only has about 3, 500 seafarers and the global demand for seafarers is around 250, 000. As a result, most of South Africa's total import and export trade has been carried by foreign ships employing foreign seafarers. According to the Department of Transport (2017a), the unfortunate loss of South Africa's shipping capacity had an impact of an annual loss of net foreign earnings estimated at over **R40 billion** annual earnings for Maritime transport services, which is paid to foreign owners and operators.

Supply of skills within the sub-sector is very limited. According to HRDCSA (2014), there are still few high schools that offer Maritime studies at basic education level. Maritime training at basic education level presents a huge skills development potential and has assisted in awareness creation about the sub-sector. At higher education level, there are also few Technical Vocational Education and Training (TVET) colleges that offer Maritime related training.

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In recent times, increased emphasis and investment have been placed on the local Maritime industry with initiatives such as Operation Phakisa's Ocean Economy. As such, the expanded definition of the Maritime sector goes beyond simply the transport of goods and people over water bodies.

With the intent of aligning the maritime sector skills with the national skills development agenda, the South African Maritime Safety Authority (SAMSA) has developed a maritime sector model, which incorporates the greater value chain:

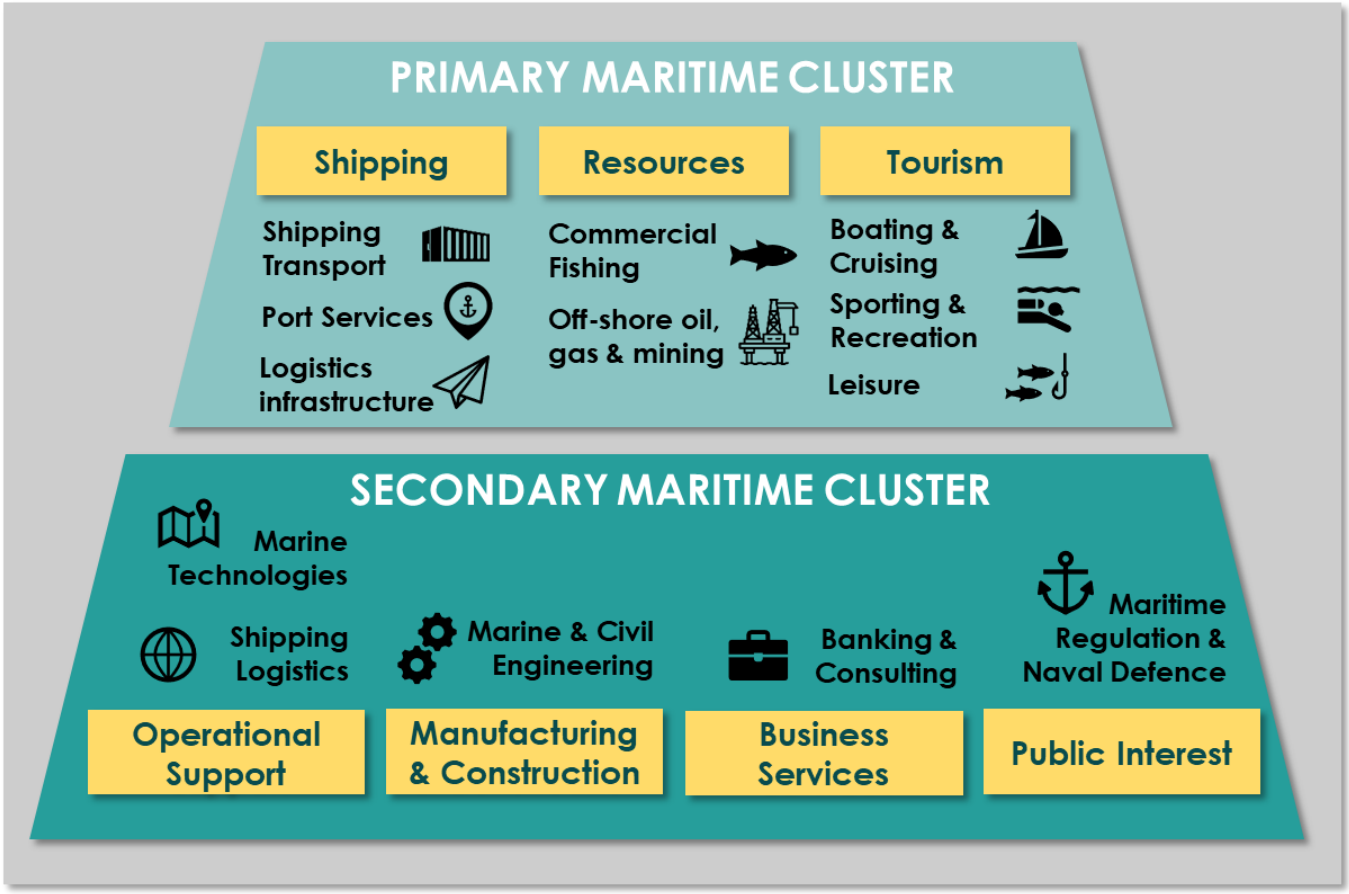

Figure 6-52: South African Expanded Maritime Sector

PORT, SHIPPING NETWORKS AND VOLUMES (PASSENGER & FREIGHT)

According to the Department of Trade and Industry (2013), South Africa is a trans-shipment point between the emerging markets of Central and South America, South East Asia, Europe, the east and west coasts of Africa, as well as the South African Customs Union (SACU) and Southern African Development Community (SADC). Major shipping lanes pass along the South African coastline in the South Atlantic and Indian oceans, and its **eight commercial seaports** form the largest, best equipped and most efficient network on the continent. These commercial ports are (1) Richards Bay and (2) Durban in KwaZulu-Natal; (3) East London, (4) Port Elizabeth and the (5) Port of Ngqura in the Eastern Cape; and (6) Mossel Bay, (7) Cape Town and (8) Saldanha in the Western Cape (SAMSA, Undated(a)).

The main export ports for the South African mines are Richards Bay (e.g. coal) and Saldanha Bay (e.g. iron ore), while the other ports are used more for industrial products (vehicles, oil and grain) and fishery (Transnet, 2016). Furthermore, Saldanha Bay and Richards Bay are designed for the largest bulk carriers in the world (SAMSA, Undated(a)).

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The Transnet National Ports Authority (TNPA) manages the ports, while Transnet Port Terminals (TPT) is responsible for managing port and cargo terminal operations (Transnet, 2010). TNPA and TPT are two of the five operating divisions of Transnet SOC Ltd – a state-owned enterprise (SOE).

In terms of volumes, limited information is available on the number of passenger arrivals that are derived through cruise liners stopping in South Africa. However, it is estimated that approximately 200,000 cruise tourism passengers visit South Africa annually. It is projected that this number could increase to approximately one million passengers by 2025 (PMAESA, 2011).

Table 6-18 below reveals that approximately 5 million containers (twenty-foot equivalent containers) were shipped through South African ports in 2014. This translates to approximately 173 million tonnes.

Table 6-18: Maritime cargo volumes, 2014/15

Water Transport	Twenty Foot Equivalent (TFE)
Containers	5 000 000
Tonnage	172 892 630

Source: (Ports Regulator of South Africa, 2015/16); (South African Market Insight, 2015)

ECONOMIC CONTRIBUTION

The following table gives a breakdown of the water transport industry and its contribution towards the transport and storage sub-sector GVA and employment contribution.

Table 6-19: Contribution of Water Transport to the Economy, 2016

Water transport	GVA (Rand 'million)	GVA contribution to sector	Contribution to National GVA	Employment	Employment contribution to sector	Contribution to national Employment
Water Transport	**R 1 648**	**100%**	**0,04%**	**3 337**	**100%**	**0,02%**
Transport & storage sub-sector	R 319 033	0,7%	8%	689 449	0,5%	5%
Transport, storage & communication sector	R 389 178	0,4%	10%	833 550	0,4%	4%

Source: Quantec 2018

The water transport industry holds less than 1% share of the transport and storage sub-sector and is not a major contributor towards the national GVA or employment.

Figure 6-53 below gives a breakdown of the provincial share of the water transport industry according to GVA distribution.

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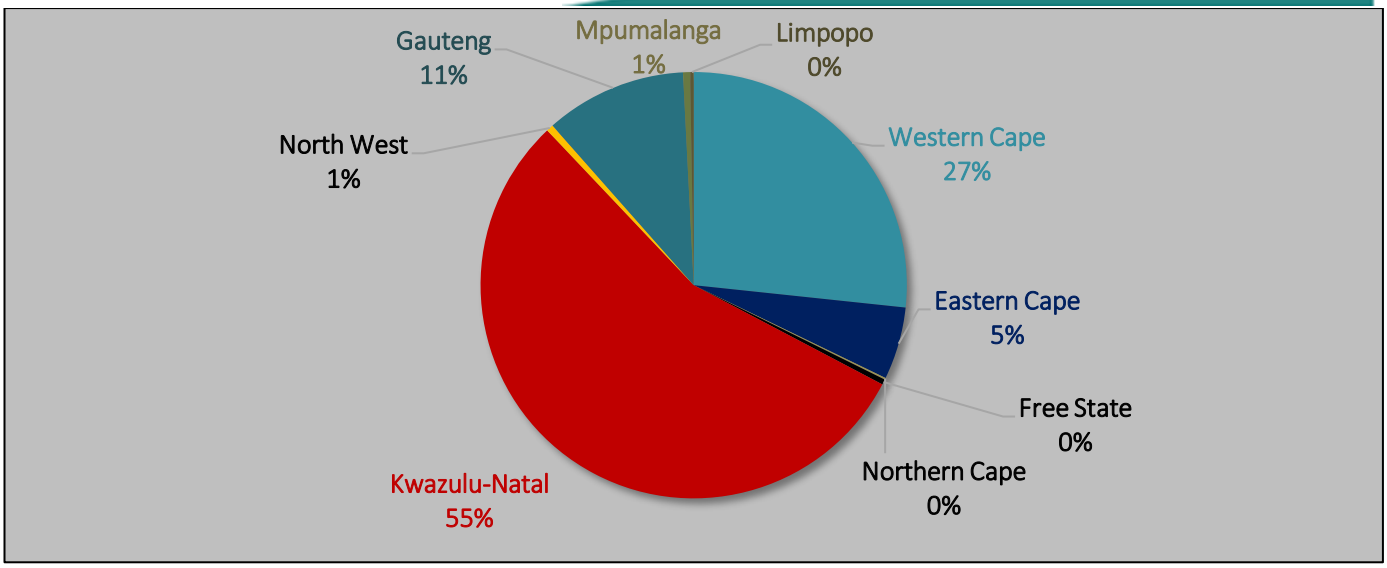

Figure 6-53: Provincial Water Transport Contribution to Transport Sector, 2016

Source: Quantec 2018

As expected, coastal provinces (excluding the Northern Cape) hold approximately 87% of the water transport industry share. KwaZulu-Natal holds approximately 55% of the industry share, with the port of Durban and the port of Richards Bay being the country's busiest ports. Interestingly, Gauteng contributes approximately 11% towards the GVA.

Figure 6-54 below gives a breakdown of the employment share for the water transport industry. Approximately 53% of the labour force consists of formal employment. A total of 29% are semi-skilled, 18% are skilled and 7% are low skilled. Approximately 47% of the water transport labour force consists of informal employment.

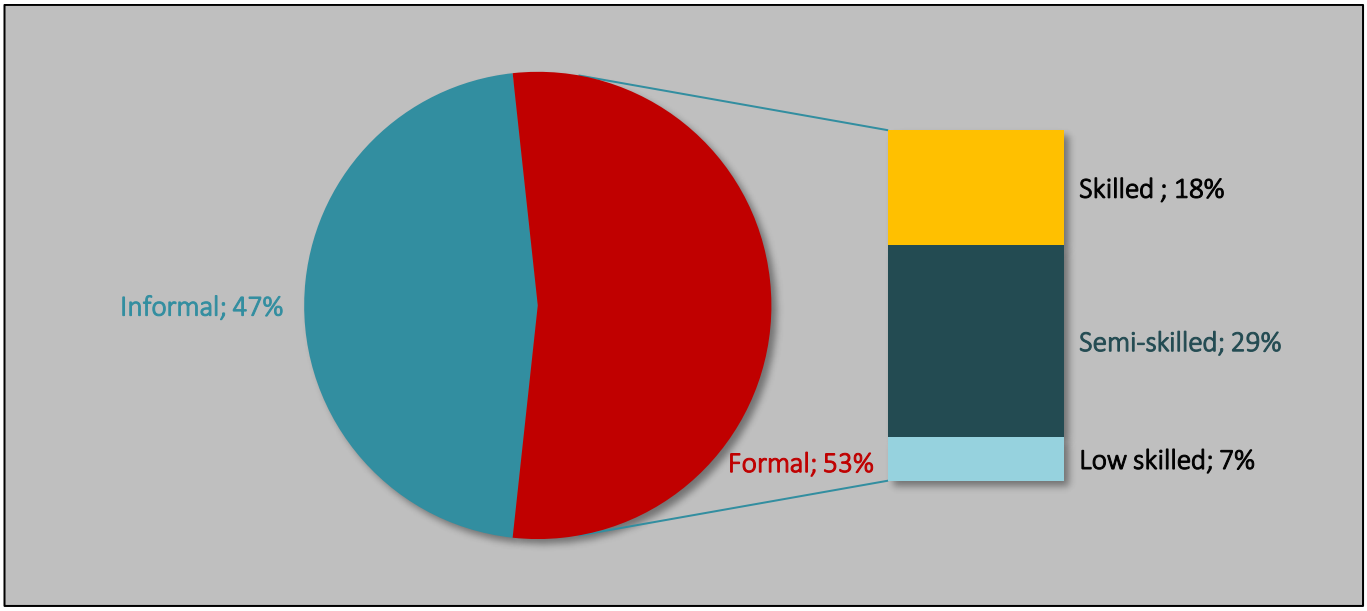

Figure 6-54: Water transport employment share, 2016

Source: Quantec 2018

The table below gives detailed insights into the provincial share of the water transport sector. As expected, KwaZulu-Natal holds the greatest employment share (43%), both formal and informal, followed by the Western Cape (32%). Gauteng holds approximately 15% of the employment share for water transport.

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Table 6-20: Provincial share of employment for water transport

Province	Formal		Informal		Total	
Western Cape	578	32%	497	32%	1 075	32%
Eastern Cape	80	4%	116	7%	196	6%
Northern Cape	3	0%	2	0%	5	0%
Free State	6	0%	11	1%	17	1%
KwaZulu-Natal	833	47%	605	39%	1 438	43%
North West	8	0%	31	2%	39	1%
Gauteng	262	15%	251	16%	513	15%
Mpumalanga	10	1%	35	2%	45	1%
Limpopo	3	0%	6	0%	9	0%
Total	**1 783**	**100%**	**1 554**	**100%**	**3 337**	**100%**

Source: Quantec 2018

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6.3.4.1 MARITIME PROFILE

This sub-section aims to profile the Maritime industry through insights gained during the extensive primary data gathering exercise. Aspects profiled include:

- Maritime businesses
- The different role-players active within the Maritime industry, and their respective functions
- Growth trends experienced within the Maritime industry
- Specific challenges faced by the Maritime industry

BUSINESS PROFILE

Surveys were distributed to transport businesses to form a greater understanding of the dynamics of transport businesses (please refer to ***Section 2 Research Approach***).
The results for businesses that fall within the Maritime Chamber are discussed according to the following aspects to provide greater insights:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

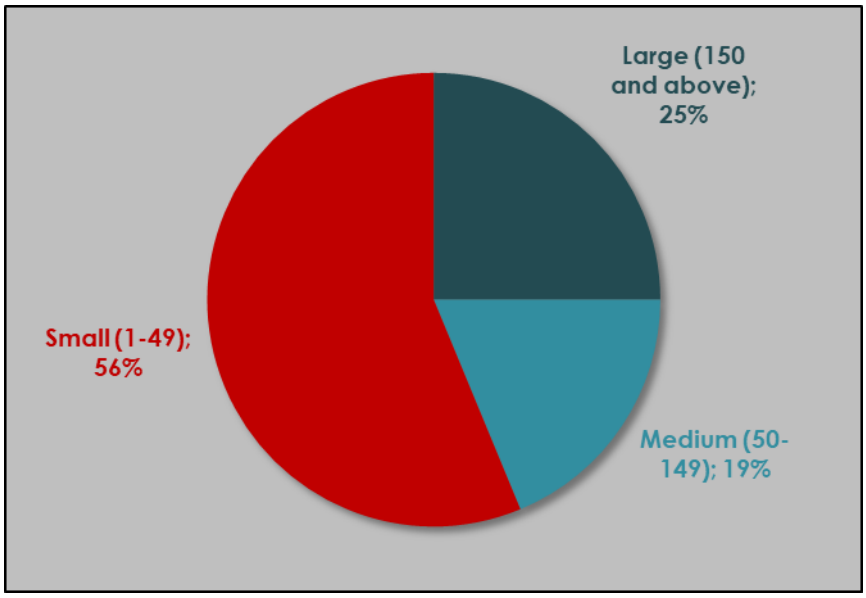

Figure 6-55: Maritime Business Size

Business size in this context refers to the number of people employed.

Approximately 56% of responding businesses are classified as small (1-49 employees), 19% are medium (50-149 employees) and 25% large (150 or more employees).

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GEOGRAPHIC DISTRIBUTION

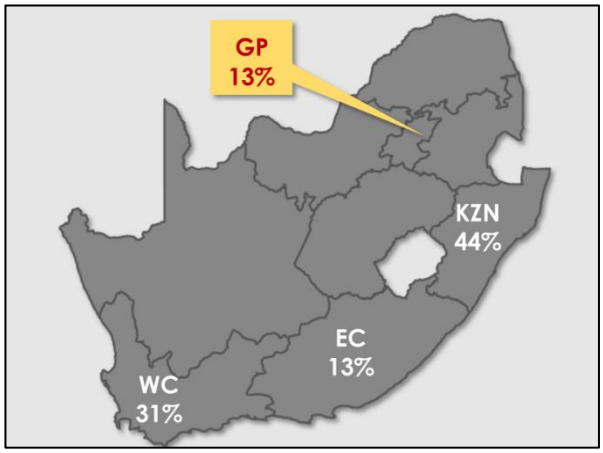

Figure 6-56: Geographic distribution for Maritime Businesses (head office)

Responding businesses were asked to indicate the location of their head office, as illustrated in Figure 6-56.

Approximately 44% of responding businesses are in KwaZulu-Natal, 31% in the Western Cape, 13% in the Eastern Cape and 13% in Gauteng.

These results correlate with the location of South Africa's ports and economic centre, Gauteng.

EMPLOYMENT PROFILE

Responding businesses were requested to give an indication of the number of employees appointed per OFO Major Group. These results are illustrated as percentage distribution across the occupation groups in Figure 6-57 below:

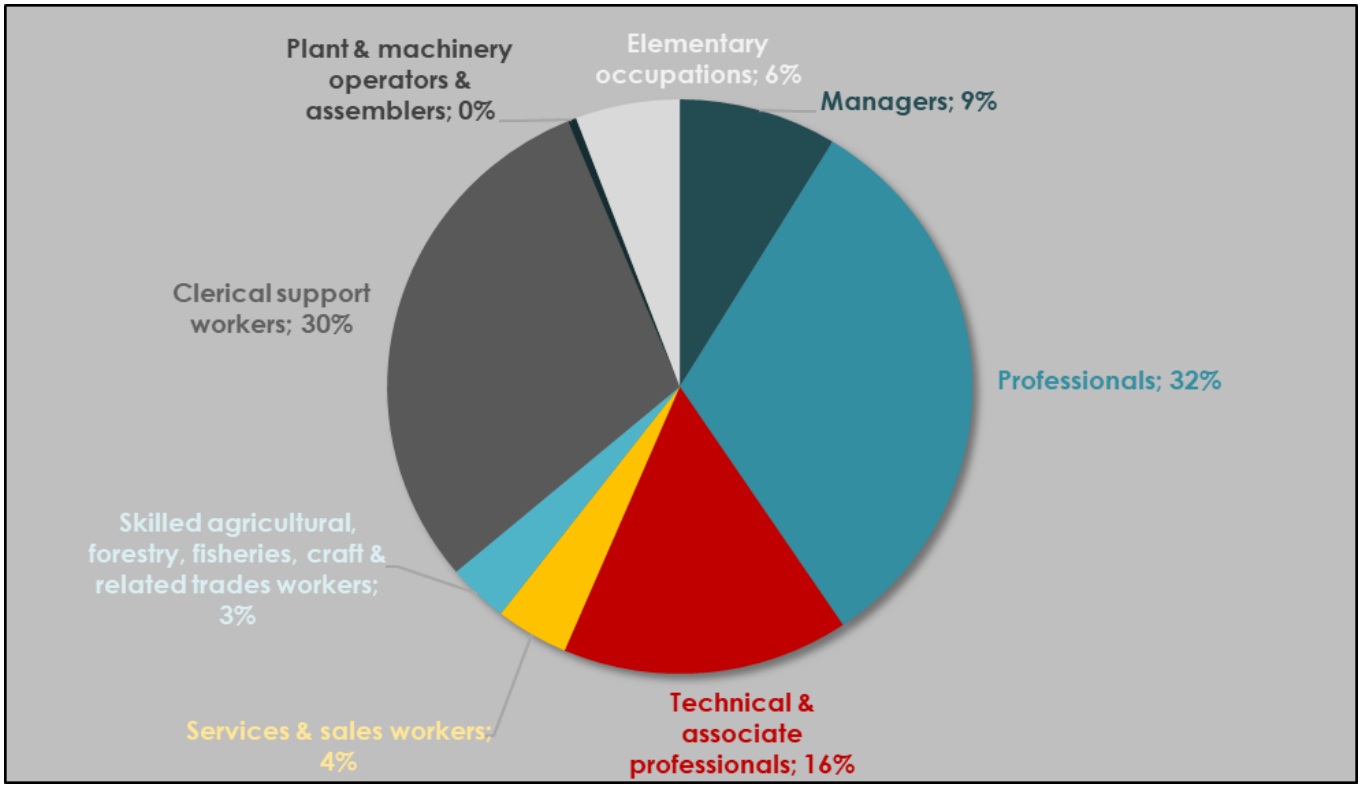

Figure 6-57: Maritime Business average occupation group distribution

Source: UE 2018

The Maritime industry is dominated by Professionals, making up about 32% of all occupations of responding businesses. This is followed closely by clerical support workers at 30%. Technical and associate professionals make up 16% of occupations, managers make up 9%, while elementary occupations make up 6%. The least prominent occupations for the Maritime industry are services and sales workers (4%), skilled

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agricultural, forestry, fisheries, craft and related trades (3%) and plant and machinery operators and assemblers (0%).

PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Responding businesses were asked to report on the employment growth experienced over the past 5 years. This is illustrated in the figure below:

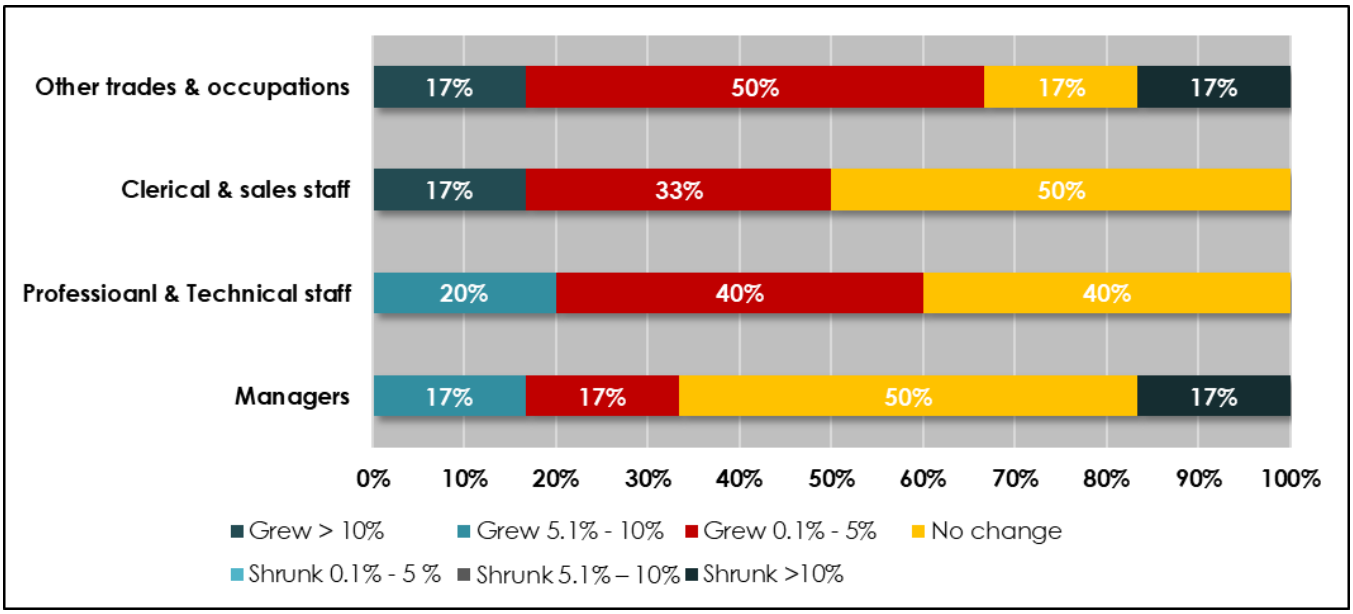

Figure 6-58: Maritime Business employment trends over last 5 years

Source: UE 2018

About half of responding businesses reported growth for clerical and support staff, while the other half experienced no change in employee numbers. The majority of businesses reported growth for professional and technical staff (60%) and other trades and occupations (67%), while 50% believe that there was no change in the number of managers over the last five years.

Responding businesses were also asked to provide an indication of the anticipated outlook for employment growth for the next five years. As illustrated in Figure 6-59, Maritime businesses expect to see the same employment trend for managers and professional and technical staff for the next five years as they experienced in the previous five years. For clerical and sale staff, 60% of businesses expect to see growth.

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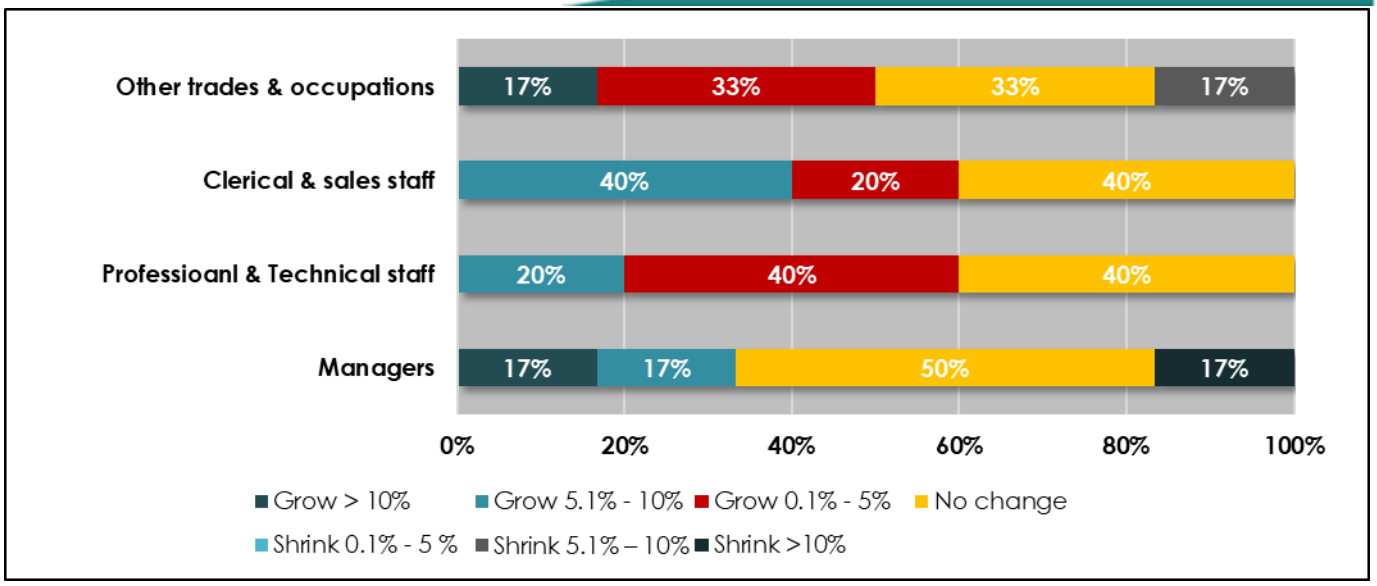

Figure 6-59: Maritime Business anticipated employment trends for the next 5 years

Source: UE 2018

ROLE PLAYERS

A number of role players have a bearing on the Maritime sub-sector, comprising both government parastatals, non-government organisations, training institutions, and associated Maritime or fishing agencies. There are also a significant number of peripheral entities that may also indirectly have a bearing on the sector, its economic activities and skills development agenda.

During the focus group workshop, it was agreed, particularly when it comes to the role players in the industry, that it is more encompassing to refer to the sector as "ocean freight" in discussion which creates a clearer delineation between transport-related activities at sea and all economic activities involving seagoing and fisheries personnel at sea, which is not always easily distinguishable. Identifying key issues and players in the "ocean freight" segment not only narrows down the focus area, but it also directs conversation into the correct channels to achieve the aims of the research, which is sector-specific profiling to inform the skills plan for said sector.

As far as the regulatory environment, laws are slow to be effective; legislation in the industry is not attractive or competitive enough which results in the slow growth and development of the industry. Moreover, the Acts that govern the Maritime sub-sector are outdated and they create problems where references are still made to food allowances for different race groups while at sea, for example. These outdated and outmoded requirements infringe on the human and constitutional rights of seafarers. However, the governing bodies in the industry are yet to amend these laws. This speaks to the neglect of the industry, its laws and operations.

The key role-players in the Maritime transport sub-sector are as follows:

STATUTORY AND AUTHORITY BODIES

- *Ports Regulator of South Africa*
  The key function by the Ports regulator is economic regulation of Ports systems, in line or in sync with development strategies by the State (TETA) in this instance.

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Regulations are around pricing, access, equity, monitoring industry's compliance with regulation and any other queries or complaints lodged. Ports of South Africa is an independent regulator (Transport Forum, 2018)

- *South African Maritime Safety Authority (SAMSA)*

  SAMSA is the authoritative body in the Maritime sector (SAMSA, 2013). It is tasked by DoT
  - To ensure safety of life and property at sea;
  - To prevent pollution from ships in the marine environment; and
  - To promote the country's Maritime interests

  In addition to this, SAMSA is also mandated to: Administer merchant shipping and tracking SA vessels along coast line.

- *Transnet National Ports Authority (TNPA)*

  TNPA, a division of Transnet Limited, is mandated to control and manage all eight commercial ports on the 2954km South African coastline by providing port infrastructure and marine services (Transnet, n.d.).

- *Department of Transport*

  The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities and other levels of government, regulating through setting norms and standards, and monitoring implementation (National Government, 2018).

- *Department of Agriculture, Forestry and Fisheries*
- *Department of Environmental Affairs*

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *South African Association of Ship Operators and Agents (SAASOA)*

  Formed in 2007, SAASOA is a leading organisation in Maritime interests in SA. It represents its membership of professions in the shipping industry, such as ship owners, operators and local agents (Transport Forum, n.d.).

- *South African Maritime Professionals Associations (SAMPA)*

  Serves the interest of professionals in master marines, deck officers, and cadets. SAMPA also promotes Maritime education and training (Society Masters Marine of South Africa, 2018).

- *The Society of Maters Mariners South Africa (SOMMSA)*

  SOMMSA was formed in 1940 and is the only organisation that has represented the professional interests of South African Master Mariners, Deck Officers & Cadets and those carrying out shore-based employment by virtue of their sea-going experience & certification.

- *South African Institute of Marine Engineers and Naval Architects (SAIMENA)*

  SAIMENA was founded in 1975 and is the only technical society in South Africa dedicated to marine engineers and naval architects. It has a total membership of around 400.

- *South African International Maritime Institute (SAIMI)*

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SAIMI facilitates skills development in SA especially in the 'Blue economy', an objective emanating from operation Phakisa (SAIMI, n.d.)

- *Maritime Law Association (MLASA)*
  Aims to ensure that legislation as set out by the government keeps abreast with other laws governing Maritime sector in the world (MLASA, 2018).

- *International Chamber of Shipping (ICS)*
- *Society of Master Mariners South Africa (SOMMSA)*
- *South African Institute of Marine Engineers and Naval Architects (SAIMENA)*
- *Institute of Marine Engineering, Science and Technology (IMarEST)*
- *International Federation of Shipmasters' Associations (IFSMA)*

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018)

- *National Union of Metalworkers of South Africa (NUMSA)*
  Formed in 1987, NUMSA is the biggest metalworkers trade union in South Africa affiliated with the following sectors: engineering, motor, auto/tyre, and electronics (NUMSA, 2013).

- *International Transport Workers Federation (ITF)*
  The ITF is an international federation of transport workers' trade unions, with over 670 trade union federations in 140 countries and representing 19.7 million working men and women in all transport sectors (ITF Global, n.d.).

- *Food and Allied Workers Union (FAWU)*
- *National Union of Mineworkers (NUM)*
- *United National Transport Union (UNTU)*
- *Democratized Transport Logistics & Allied Workers Union (DETAWU)*

OTHER ROLE-PLAYERS

- *National Sea Rescue Institute (NSRI)*
  NSRI tasks itself with saving lives on SA waters. It does work with other emergency services. NSRI does have an education arm called WaterWise, teaching children what to do in an emergency whilst waiting for professional help (Transport Forum, 2018)
- *South African Maritime Training Authority (SAMTRA)*
  Provides international standard, quality professional Maritime short courses, simulator training and Officer, Cadet & Rating training administration services to ensure SA Maritime is abreast with international training of cadets (SAMTRA, n.d.)
- *Durban University of Technology (DUT)*
- *Cape Peninsula University of Technology (CPUT)*
- *Nelson Mandela University (NMU)*
- *The fishing community*
- *Foodbev SETA*

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GROWTH TRENDS

There is an increasing demand for inter-modal facilities and dry ports across the African region in an effort to save money. This calls for an integration of distribution facilities with inter-modal transfer facilities at sea ports to avoid the additional handling of containers and to cut costs. Ports and sea transportation are an important component for major services involving logistics, and oil and gas infrastructure (PWC, 2018). Integrating auxiliary services with those of Maritime or ocean freight would increase the economic performance and sustainability of either industry.

This section highlights the growing trends that may have an influence on the operations, employment and skills needs of the industry as observed in the stakeholder engagements. It should be stated that there is a lot of ambivalence around the current and future conduct and prospects of the Maritime sub-sector across channels and role-players. A significant reason for this is that the ocean freight economy of the sector cannot easily be distinguished from the fisheries segment within it. The sector is also closely linked to the forwarding & clearing sub-sector.

Nevertheless, new change drivers or trends have been identified by a transport and logistics study conducted by PWC (2018) that are sure to have an impact on how Maritime activities happen in the coming future. Some examples include:

- Tracking and digital platforms will become the norm, which will allow for real-time progress tracking along the supply chain using mobile phones.
- Ports are becoming paperless due to the growing use of digital technology and the Internet by customs and excise authorities as a means of processing shipments. Emerging tools in the import and export process are more interactive and thus reduce the need for paper.
- Inland terminals that help consolidate freight flows are increasingly becoming important hubs for where corridors may diverge.
- The emergence of hub ports indicates a shift toward greater Maritime freight consolidation. Global trade has increasingly been making use of trade by container for many higher-value commodities. In many developed parts of the world this has resulted in a reduction of the break-bulk and bulk market.
- Back-of-port logistics facilities have developed into specialised areas for commodities in recent years. In turn, consolidation areas, warehouses, and commercial or retail distribution areas around these areas are growing too, which means that land use and local transport planning has had to or would have to develop accordingly (PWC, 2018).

The trends identified in the PWC 2018 report is affirmed by the stakeholder engagements and, as characterised in the profiles of the other sub-sectors, can be described according to three reoccurring themes, namely technology, transformation and projected economic performance.

Technology

The sector will be affected by advancements in technology and digitisation trends, much like the Road Freight and Forwarding & Clearing sectors, but also:

- The emergence of autonomous ships or vessels in the future, or the use of remote operator's assistance and partial automation where ships can be left unattended for certain amounts of time.
- Blockchain technology
- The Internet of Things (IoT) will allow for consignments to be tracked digitally
- Drones which will affect warehousing and distribution
- Robotics which means less man labour, reduced costs, reduced risks
- 3D printing that will change production and distribution
- Engine and fuel related advancements

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Transformation

The Maritime sub-sector seems to still be making use of very outdated and outmoded laws, policies and practices, such as the Merchant Shipping Act. The stakeholders engaged during the research process could not account for real transformative objectives being outlined or achieved in the sector. Some of the newer laws are slow to be effective since the regulatory environment is not flexible enough. This slow change and ineffective legislative practices impede on the attractiveness and competitiveness of the industry. The outdated laws in the sector also happen to infringe on the human and constitutional rights of seafarers. Therefore, the regulations that govern SA's Maritime industry require updating or repeal. Transformation in terms of the creation of space, jobs and participation for all South Africans in the sector, whether slow or non-existent, demands attention from its governing and authority bodies.

Projected Economic Performance

The Maritime sub-sector may be one of the smaller industries in the Transport economy, but it has a lot of promise in terms of job opportunities. Maritime engineers and navigation personnel are in high demand abroad. SA should look at developing Maritime skills as an export product to earn foreign income. The SA sector has highly regarded learning programmes and institutions; if used strategically this could positively contribute to the industry's economic performance in the future.

The Maritime sector's performance is directly related to international economic growth since it relies largely on imports and exports. Therefore, SA not having its own fleet taking cargo in and out of the country is a lost opportunity for economic expansion and growth for the sector.

The industry sees higher turnover rates and increased efficiency with the size of ships increasing over time. Previously, three ships with 20 crew on-board each were needed to transport tons of containers. Today, only one ship is required to carry the same load, with fewer crew on-board. While this may impact employment numbers, they have a significantly positive impact on the economic viability of the industry. That said, SA seafarers are unable to take advantage of international opportunities. Industry stakeholders consulted believe that the industry globally requires an addition upward of 1500 seafarers. SA has about 23% of certified seafarers who are unemployed. Institutional authorities can step in here to remedy this situation. Many of the seafarers may be certified, but do not have the aptitude to source out and redeem opportunities. Their experience, in turn, could benefit the local industry upon their return.

Methodologies and operating standards such as Operation Phakisa and the recently adopted STCW-F, or International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, will unmask the economic growth potential of the industry. These will ensure that skills and capacity building is prioritised for the Maritime workforce which will positively reflect on the industry in the long run. More jobs will be created through these interventions, and the industry's productivity and efficiency will be enabled too.

KEY CHALLENGES

Sea ports in the Maritime sector are faced with similar arising challenges as the rest of the Transport industry in SA and around the world. How ports are operated and managed are growing concerns for the Maritime industry, among other concerns such as the role ports play in economic development and in the logistics supply chain.

Among the technology-motivated challenges in the Sea transportation space are more traditional challenges that still remain relevant, such as city expansion, congestion and urban encroachment, which means that a greater need for spatial planning in the Maritime sector is prevalent in order to create more

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efficient cargo flows between road and sea transport facilities. Other challenges were highlighted in the stakeholder engagements as follows:

- New regulations and international law
- Carbon taxes
- Seafarers taxes
- Exchange rate's impact on labour
- Export incentives
- Industry buy-in
- Advancements in technology
- Global warming
- Globalisation
- Shortage of fishing skills
- No accelerated training or practical exposure
- Skills need to be re-engineered to accommodate growing needs and capabilities
- Seafarers causing undue labour disruptions that infringe on safety compliances:
    - For example, demands are made with threats to abandon vessels in the middle of the ocean. Ethical and lawful employment practices, however, would instil a sense of tenacity in what is a very demanding environment for these workers.
    - These disruptions are also incited by the interference from authority bodies and government departments with Cadet Training on international vessels. This creates a reluctance on the part of international companies to employ SA seafarers.
- The Maritime sector's policy environment is outdated and inconsistent. Skills qualifications maintenance is critical to ensure workers and the industry's relevance.

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6.3.5. INTER- AND MULTI-MODAL TRANSPORT STATUS QUO

This status quo section describes the status of the Inter- and Multi-modal Transport industry. The industry is often referred to as auxiliary transport activities and consists of the Forwarding & Clearing, and Freight Handling sub-sectors. The section starts off with an overview of the Inter- and Multi-modal Transport industry, including what it comprises and its economic activities and GVA/GDP contributions to the national economy. These major sections are followed by profiles for each sub-sector in auxiliary transport activities.

Figure 6-60: Inter- and Multi-Modal Transport sub-sector breakdown

Thus, the profile sections will detail the business profile, role-players, growth trends and key challenges of the two sub-sectors in the auxiliary activities industry as demarcated to TETA. As mentioned, these are the Forwarding & Clearing (0), and Freight Handling (6.3.5.1) sub-sectors, and these sections are informed by the various primary research collected through online surveys and stakeholder engagements conducted in the three major economic provinces in the country.

INTER- AND MULTI-MODAL TRANSPORT DEFINITION

Inter- and multi-modal transport is classified under supporting and auxiliary transport activities, in accordance with SIC 5th edition. This class includes cargo handling, storage and warehousing, forwarding of freight, the organisation or arrangement of transport on behalf of the shipper or consignee, the receiving and acceptance of freight as well as handling (packing, crating, unpacking, de-crating, inspection, weighing and sampling) of freight.

TETA makes a distinction between Forwarding & Clearing, and Freight Handling:

Freight handling
Freight handling is an important link in the supply chain management system and provides support services to the other transport industries and sectors. This industry focusses on the handling and storage of cargo via ports (air and sea), distribution centres, factories and depots.

Forwarding & Clearing
Forwarding & Clearing, as the name implies, are concerned with two distinct actions, i.e. freight forwarding and freight clearing.

- ***Freight forwarding*** involves the movement of goods on behalf of importers and exporters, applying supply chain management solutions to ensure effective imports and exports and transportation of goods, as well as applying warehousing solutions for goods in transit.

- ***Freight clearing*** are concerned with customs clearing for exports and imports, as well as assistance in implementation and adherence to import/export and related regulations.

The inter- and multi-modal industry is responsible for connecting almost all sectors and industries in the economy and plays a great role with regards to distribution and linkages with other African, and specifically

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SADC countries. The industry involves all the various modes of transport related to freight and cargo, which includes road, Rail and air.

The industry furthermore comprises the warehousing component linked to supply chain management and logistics as well as shipment tracking and management. It is estimated that the national Freight Handling, clearing and forwarding industry handles approximately 75% of all cargo/freight moving in and around the country (SAARFF, 2014)

The importance of the industry cannot be understated, as the industry serves as the catalyst for and facilitates all forms of physical trade.

NETWORKS AND VOLUMES

It is difficult to capture accurate information pertaining to transport networks and volumes carried for the inter- and multi-modal industry. Since the services offered in Forwarding & Clearing and Freight Handling are supportive and auxiliary in nature, they are usually in operation with other activities along the value chain of any business activity.

ECONOMIC CONTRIBUTION

The following table gives a break-down of the auxiliary transport industry and its contribution towards the transport and storage sub-sector GVA and employment contribution.

Table 6-21: Contribution of the auxiliary transport sector to the economy, 2016

Auxiliary transport	GVA (Rand 'million)	GVA contribution to sector	Contribution to national GVA	Employment	Employment contribution to sector	Contribution to national employment
Auxiliary Transport	**R 46 641**	**100%**	**1%**	**240 713**	**100%**	**2%**
Transport & storage sub-sector	R 319 033	15%	8%	689 449	35%	5%
Transport, storage & communication sector	R 389 178	12%	10%	833 550	29%	4%

Source: Quantec 2018

The auxiliary transport industry holds approximately 8% share of the transport and storage sub-sector and contributes about 1% towards the national GVA and 2% towards employment.

Figure 6-61 below gives a breakdown of the provincial share of the auxiliary transport industry according to GVA distribution.

Gauteng province holds the highest share of GVA for the auxiliary transport industry at 36%, followed by KwaZulu-Natal, at 23% and Western Cape at 20%. This is to be expected, considering that the major gateways to our country, our ports (sea and air) and related networks, facilities and warehouses are situated in these provinces.

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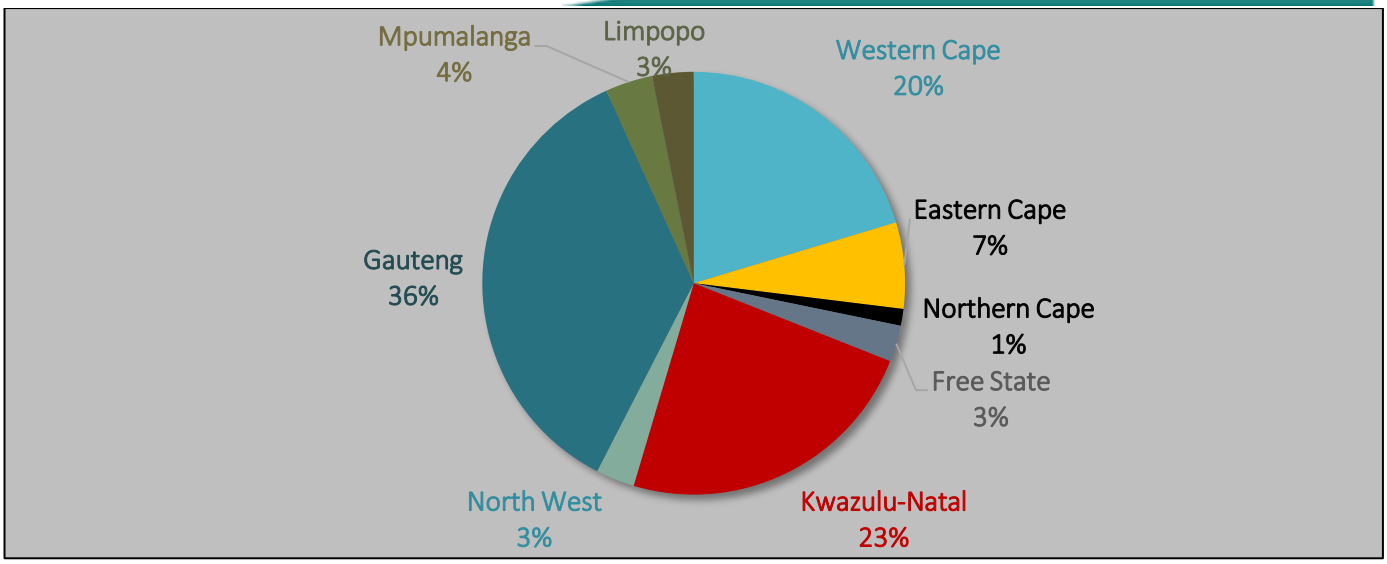

Figure 6-61: Provincial Contribution of Auxiliary Transport, 2016

Source: Quantec 2018

The figure below gives a breakdown of the employment share for the auxiliary transport industry. Approximately 53% of the labour force consists of formal employment. A total of 30% are semi-skilled, 14% are skilled and 10% are low skilled. Approximately 47% of the water transport labour force consists of informal employment.

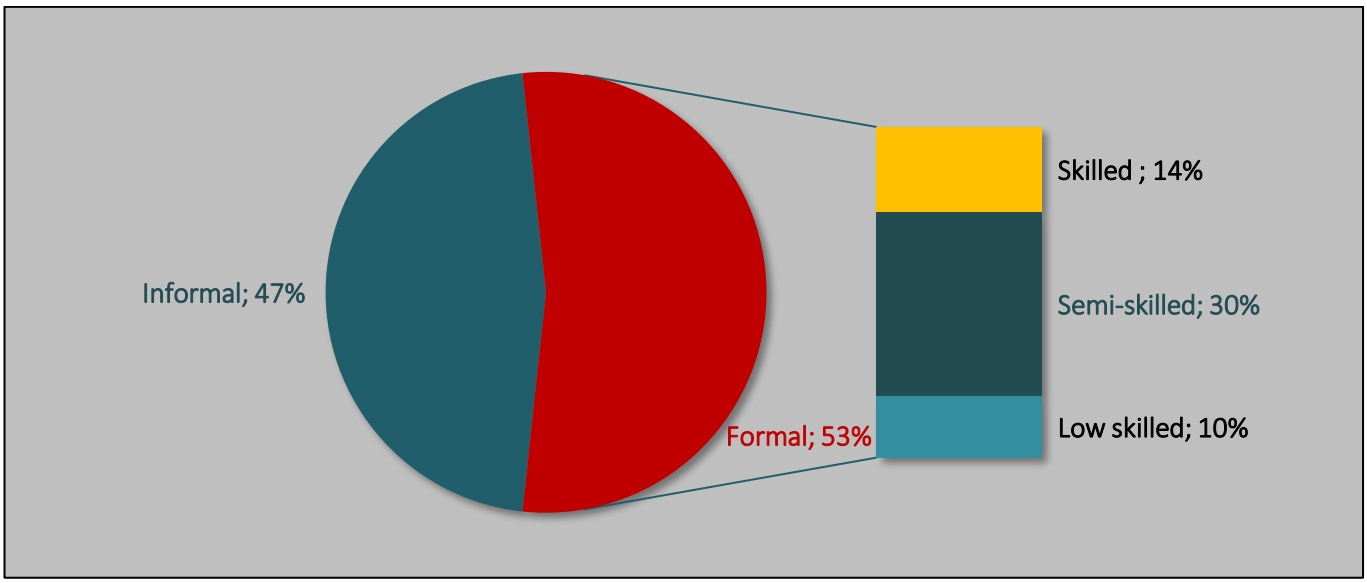

Figure 6-62: Auxiliary transport employment share, 2016

Source: Quantec 2018

The table below gives detailed insights into the provincial share of the auxiliary transport sector. Gauteng holds the greatest employment share (41%), followed by the Western Cape (20%) and KwaZulu-Natal (17%). The Northern Cape holds the lowest employment contribution for the auxiliary transport sector.

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Table 6-22: Provincial share of employment for auxiliary transport

Province	Formal		Informal		Total	
Western Cape	26 742	21%	21 370	19%	48 112	20%
Eastern Cape	6 860	5%	7 371	7%	14 231	6%
Northern Cape	1 152	1%	1 541	1%	2 693	1%
Free State	3 126	2%	3 480	3%	6 606	3%
KwaZulu-Natal	22 974	18%	17 848	16%	40 822	17%
North West	3 394	3%	3 877	3%	7 271	3%
Gauteng	54 868	43%	43 242	39%	98 110	41%
Mpumalanga	5 069	4%	6 900	6%	11 969	5%
Limpopo	4 362	3%	6 537	6%	10 899	5%
Total	128 547	100%	112 166	100%	240 713	100%

Source: Quantec 2018

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6.3.5.1 FORWARDING & CLEARING PROFILE

Extensive primary research was undertaken in order to profile the Forwarding & Clearing Industry. Insights gained informed specific aspects of the Forwarding & Clearing Industry related to:

- The profile of Forwarding & Clearing businesses
- The different role-players active within the Forwarding & Clearing industry, and their respective functions
- Growth trends experienced within the Forwarding & Clearing industry
- Specific challenges faced by the Forwarding & Clearing industry

BUSINESS PROFILE

Surveys were distributed to transport businesses to form a greater understanding of the dynamics of transport businesses (please refer to ***Section 2*** Research Approach*)*.

The results for businesses that fall within the Forwarding & Clearing Chamber are discussed according to the following aspects to provide greater insights:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

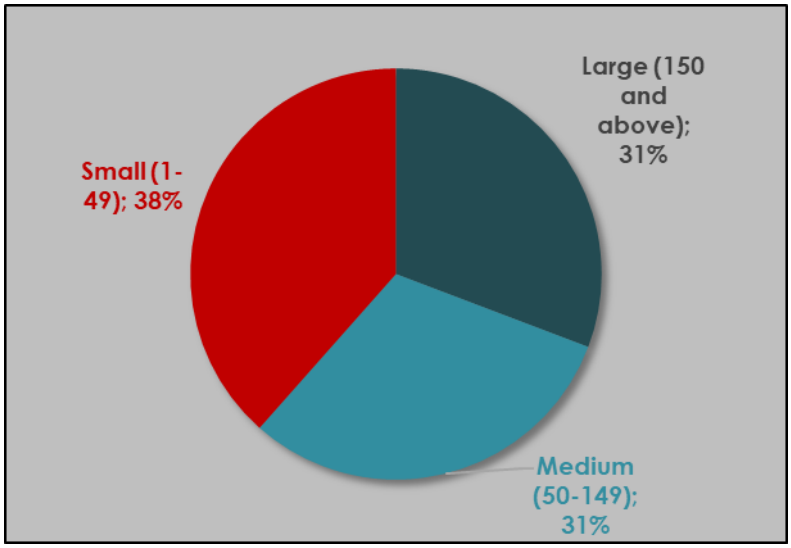

Figure 6-63: Forwarding & Clearing Business Size

Responding businesses were classified according to the number of people they employ.

Approximately 38% of responding businesses employ 1 to 49 people (small), 31% employ 50 to 149 people (medium) and 31% employ 150 or more people. These results are illustrated in Figure 6-63

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GEOGRAPHIC DISTRIBUTION

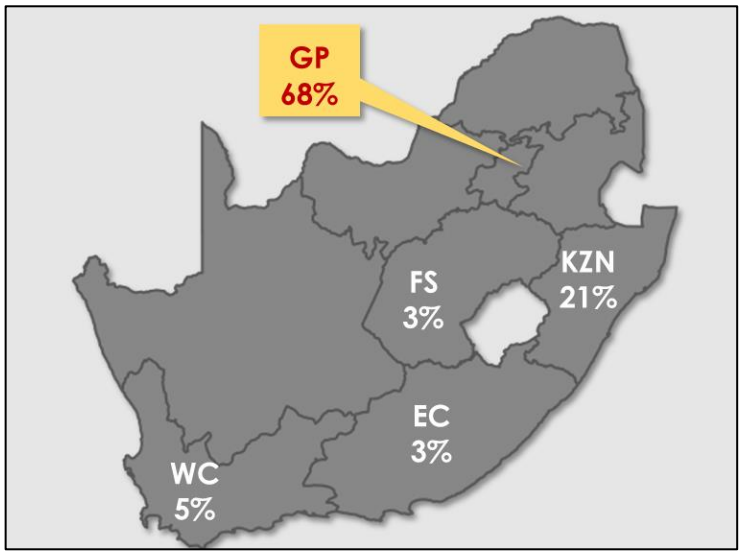

Figure 6-64: Geographic distribution for Forwarding & Clearing Businesses (head office)

The geographic distribution of Forwarding & Clearing businesses is based on the head office location of the businesses.

The greatest concentration of Forwarding & Clearing businesses is in Gauteng (68%), followed by KwaZulu-Natal (21%). Approximately 5% of businesses are located in the Western Cape, with 3% located in the Free State and Eastern Cape, respectively.

The location of head offices of responding businesses correlate with the location of economic centres and major harbours in South Africa.

EMPLOYMENT PROFILE

The average employment composition for Forwarding & Clearing businesses, according to the OFO Major Groups, are set out below:

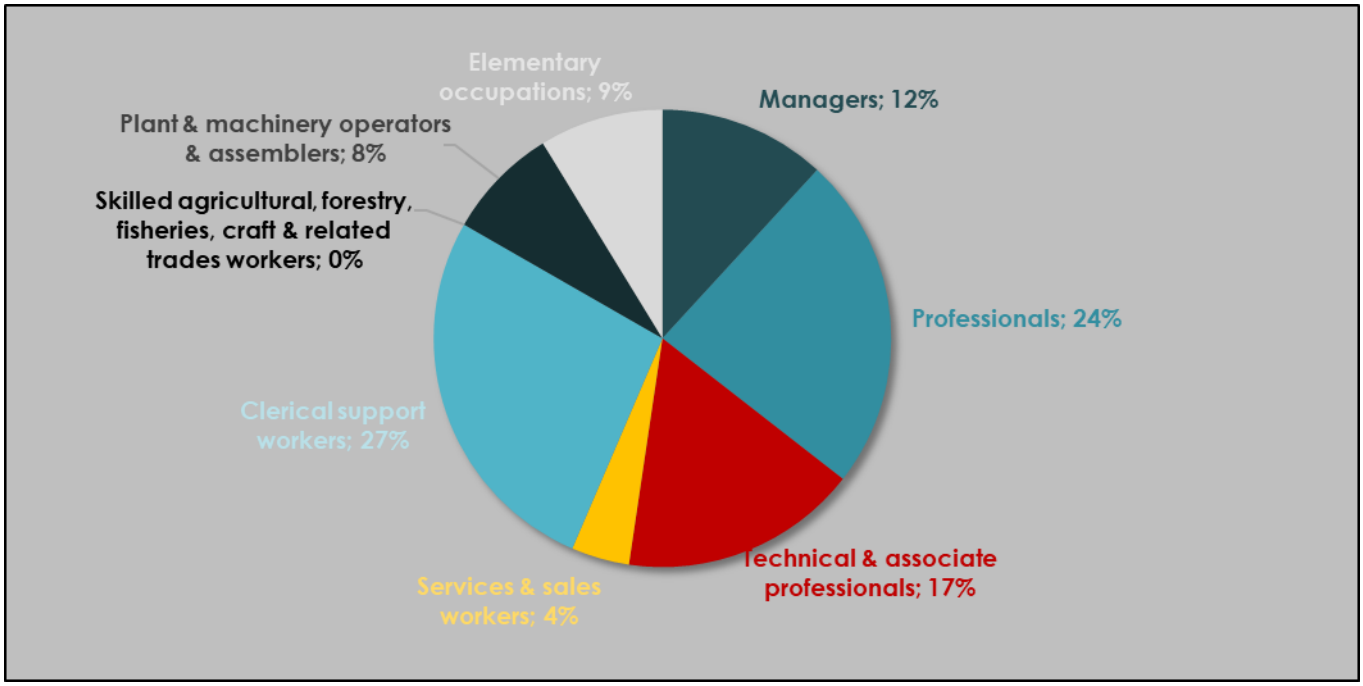

Figure 6-65: Forwarding & Clearing Business average occupation group distribution

Source: UE 2018

Approximately 27% of employees within the Forwarding & Clearing industry are classified as clerical support workers, while 24% are professionals. Technical and associate professionals and managers also make up a considerable portion of employees at 17% and 12% respectively. Services and sales occupations only hold 4% of the employment, while there are no skilled agricultural, forestry, fisheries, craft and related trades workers reported under responding businesses.

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PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Forwarding & Clearing businesses were asked to reflect on employment growth over the past five years. This is reflected in Figure 6-66.

Approximately 69% of businesses reported no change in growth for managerial positions over the last five years, with 23% indicating that these positions have declined by more than 10% over the last year, and 8% reporting that it had grown between 5.1% and 10%. It is worth noting that businesses reported the greatest growth for clerical and sales staff overall.

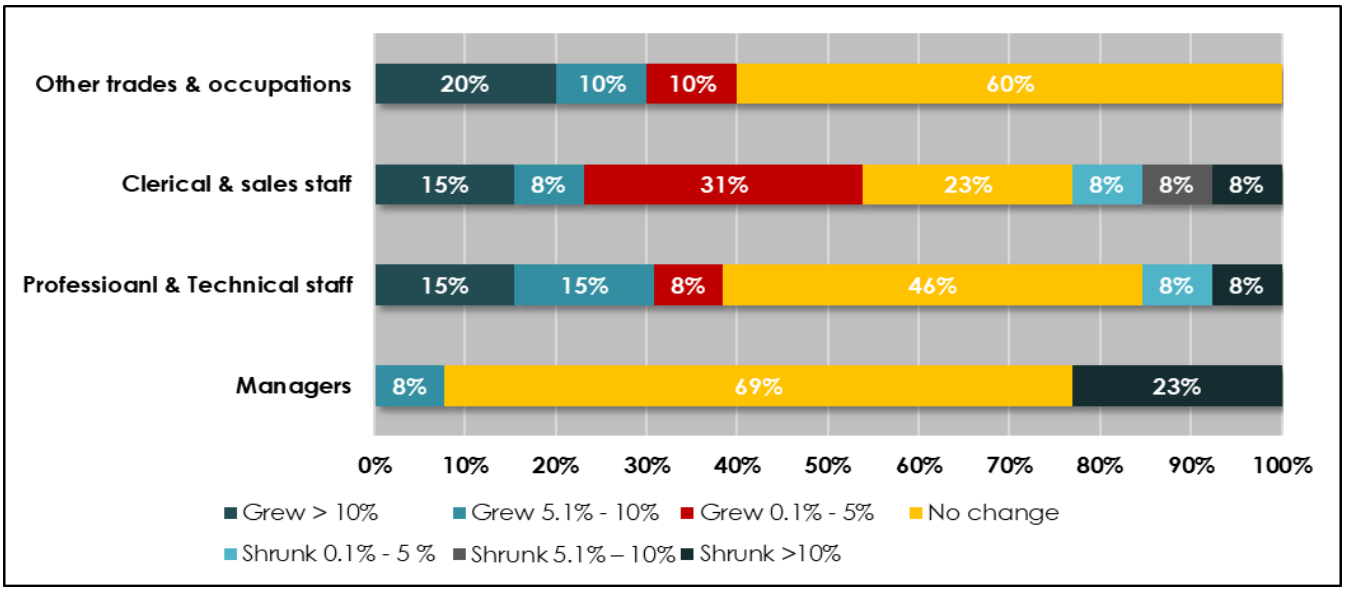

Figure 6-66: Forwarding & Clearing Business employment trends over the last 5 years

Source: UE 2018

The responding businesses were asked to give an indication of the anticipated growth for each occupation for the next five years.

As illustrated in **Error! Reference source not found.**, 70% of businesses felt that managerial positions will experience no change, which echoes the trends reported on for the past five years. Overall, the occupation most anticipated to grow is clerical and sales staff (54% of businesses anticipate some level of growth).

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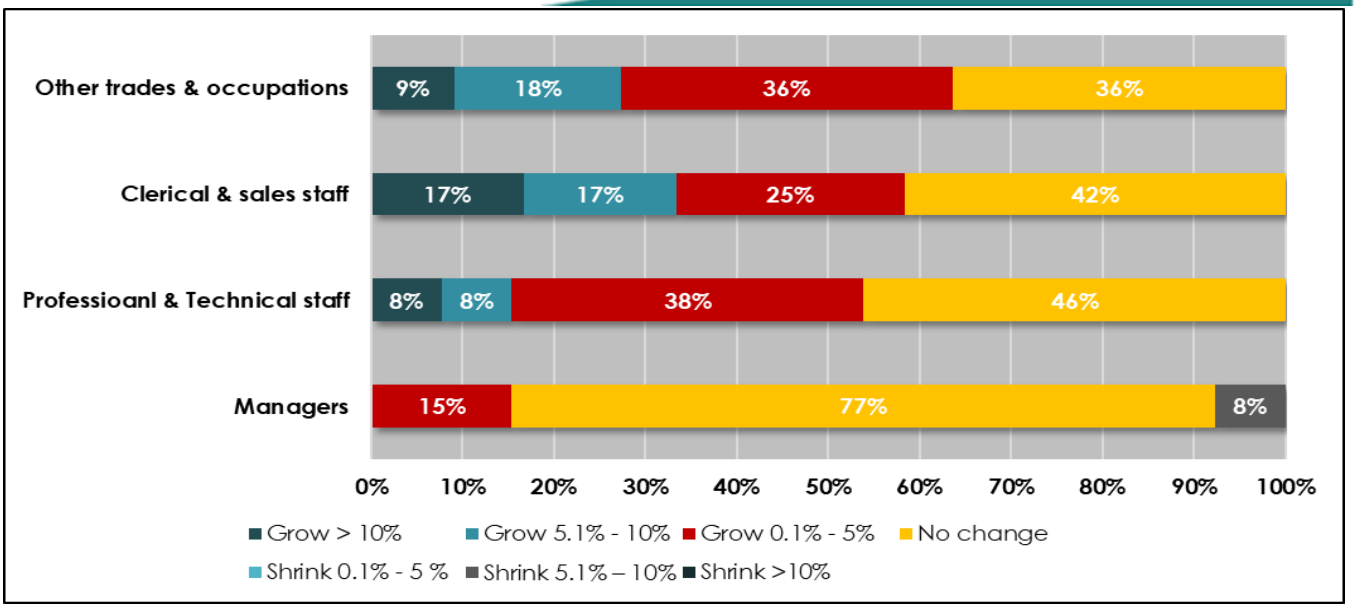

Figure 6-67: Forwarding & Clearing Business anticipated employment trends for the next 5 years

Source: UE 2018

ROLE-PLAYERS

There are a number of role-players that impact the Forwarding & Clearing sub-sector, and this includes statutory or authority bodies; industry associations or representative bodies; labour unions and representatives; as well as a number of other entities that have an indirect but crucial role in the workings of the sub-sector.

The observations made around the sector's legislative and regulatory environment involves issues such as the inefficient turnaround time of skills development levies between application and pay out. It is perceived that political interference affects the efficacy of grants paid out for skills development and how companies can make use of them effectively. It is suggested that transparency from training authorities, such as TETA, could remedy constraints such as that of skills funds not reimbursed timeously. The stakeholders engaged throughout suggest that Board Minutes from TETA should be made public since they are a public entity. This will ensure that companies are well aware of events and developments being discussed and addressed.

The Forwarding & Clearing sector have the least labour union representatives, but it is one of the eight sub-sectors with the most industry associations or bodies. The key role-players identified in the forwarding and cleaning sub-sector are as follows:

STATUTORY AND AUTHORITY BODIES

- *South African Association of Freight Forwarders (SAAFF)*
  SAAFF liaises closely with many government departments and parastatal institutions, dealing with matters such as customs, port health, trade permits, border controls, export control of perishable products, cargo handling and security at harbour terminals and airports, plant quality, Railway services and Road Freight legislation (Transport Forum, n.d.).

- *South African Express Parcel Association (SAEPA)*

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SAEPA is a non-profit organisation representing the interests of the express parcel transport industry by communicating positions to legislative and regulatory officials and promoting the use of express delivery services (Transport Forum, n.d.).

- *Transnet National Ports Authority (TNPA)*
  TNPA, a division of Transnet Limited, is mandated to control and manage all eight commercial ports on the 2954km South African coastline by providing port infrastructure and marine services (Transnet, n.d.).

- *Department of Trade and Industry (DTI)*
  The DTI encourages structural transformation in order to create a dynamic industrial and globally competitive economy. It achieves this through the creation of an environment that is conducive to investment, trade and enterprise development which thereby broadens participation in the economy and ultimately strengthens economic development (NBCRFLI, 2015).

- *Department of Transport (DoT)*
- The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities and other levels of government, regulating through setting norms and standards, and monitoring implementation (National Government, 2018).

- *Department of Higher Education and Training (DHET)*
  The Department's mission is to develop capable, well-educated and skilled citizens who are able to compete in a sustainable, diversified and knowledge-intensive international economy, which meets the development goals of the country. TETA and many other transport related entities report to the DHET (National Government, 2018).

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *South African Association of Ship Operators and Agents (SAASOA)*
  Formed in 2007, SAASOA is a leading organisation in Maritime interests in SA. It represents its membership of professions in the shipping industry, such as ship owners, operators and local agents (Transport Forum, n.d.).

- *National Bargaining Council for the Road Freight and Logistics Industry (NBCRFLI)*
  Governed by the Labour Relations Act of 1995, the NBCRFLI allows for employer and employee organisations to establish a bargaining council for an industry and area. Through collective bargaining, trade unions and employer organisations, which are party to the Council, the NBCRFLI are able to negotiate matters that are of mutual interest to the Road Freight and Logistics Industry (NBCRFLI, 2015).

- *National Employers' Association of South Africa (NEASA)*
  Established in 1996, NEASA provides all *employers* access to affordable top-quality labour law representation and industrial relations services (NEASA, n.d.).

- *Intelligent Transport Systems South Africa (ITSSA)*
  ITS represents public and private sector to ensure that intelligent transport systems are kept up to date with technology aiming to make transport operation more efficient (Transport Forum, 2018).

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- *Chartered Institute of Logistics and Transport SA (CILTSA)*
  CILT is the international professional body for Logistics and Transport professionals with Sections in over 30 countries. The SA Section (CILTSA) was established in 2002. CILTSA maintains the professional standing of its members so that they are recognised for their superior ability and expertise to create world-class logistics and transport value (Transport Forum, n.d.).

- *SAPICS – The Association for Supply Chain & Operations Management Professionals*
  SAPICS is a professional knowledge-based Association that enables individuals and organisations to improve business performance (Transport Forum, n.d.).

- *The International Federation of Freight Forwarders Associations (FIATA)*
  Founded in 1926, FIATA is a non-governmental organisation representing an industry that covers about 40 000 forwarding and logistics firms and employs around 8-10 million people in 150 countries (FIATA, n.d.).

- *Companies and Intellectual Property Commission (CIPC)*
  The CIPC is organ of state within the public administration and oversees the registration of companies, co-operatives and intellectual property rights as well as the disclosure of information on its business registers. The CIPC also promotes education and awareness of Company and Intellectual Property Law and enforces the efficient and effective compliance with relevant legislation (CIPC, 2018).

- *The Council of Supply Chain Management Professionals (CSCMP)*
  Formed in 1963, the CSCMP provides networking, career development and educational opportunities to the logistics and supply chain management community. The Council represents over 8 500 members in nearly all industry sectors, government and academia from 67 countries (CSCMP, 2018).

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018)

OTHER ROLE-PLAYERS

- *SAPICS - The Association for Supply Chain & Operations Management Professionals*
  SAPICS is a professional knowledge-based Association that enables individuals and organisations to improve business performance (Transport Forum, n.d.).

- *The University of North West*
- *Private training providers:*
  - *Metro Minds*
  - *KLM (Bruma)*
  - *School of Shipping in Cape Town*
  - *Skills Development Specialists in Durban*
  - *The Da Vinci Institute*
  - *ALTO Training*
  - *DB Schenker academy*
  - *Bidvest Panalpina Logistics (BPL) academy*

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A well-developed multi-modal or inter-modal transport system in South Africa is crucial to establishing dynamic and long-term transport infrastructure supply facilities. There is an active national effort to fully integrate transport system networks to promote increased efficiency and productivity in the economy for the Transport sector. Activities of combined or integrated freight continues to reduce cargo handling, thereby saving costs and reducing the risks of security, damages and loss.

As mentioned previously, Forwarding & Clearing is increasingly being linked with Maritime activities. The demand to integrate the activities and services of the two sub-sectors is to save money and increase efficiency of operations. Ports and sea transportation are important components for major services involving logistics and supply chain. The world of transportation is shifting towards integration of services at varied modes of transport and their related activities. There is a drive to see a large-scale (virtual and global) supply chain at the centre for most of these developments.

According to a transport and logistics study conducted by PWC (2018), there are several change drivers defining this new era of the transportation economy. Some examples relevant to the Forwarding & Clearing sector include real-time tracking and digital platforms; paperless ports as customs and excise authorities use digital technology and the Internet to process shipments; inland terminals that help consolidate freight flows; Maritime freight consolidation; and back-of-port logistics to increase port capacity.
The change drivers identified through the stakeholder engagements affirm those presented in the PWC study. The trends and growth trends derived from the primary research will be described according to three reoccurring themes, namely technology, transformation and projected economic performance.

Technology
The Forwarding & Clearing sector will be affected by advancements in technology and digitisation trends characteristic to the Fourth Industrial Revolution (4IR), such as:

- Data usage or smart information
- Blockchain technology (cryptocurrencies)
- Emergence of shipping and equipment technology
- The Internet of Things (IoT) will allow for cargo to be tracked digitally
- Drones which support a virtual supply chain, changing the nature of warehousing and distribution
- Robotics which means less man labour, reduced costs, and reduced risks
- 3D printing that will change production and distribution
    - For example, imports of steel and iron will decrease as 3D printing makes use of polytech materials, which is both cheaper and faster to produce/manufacture
- Eco-friendly systems that are less industrial and hazardous to the environment
- Cameras, surveillance and security have already become prominent within the sector

Transformation
According to the stakeholder engagements, not much improvement is seen in a transformation sense for the sector since it is not fully and effectively understood. Many comply with taking in the targeted numbers, but people are never placed in full-term employment. Regulations and the B-BBEEE Scorecard makes it easy for companies to comply at surface level without affecting any real organisational or employment change for women, black women and people with disabilities in the industry. The sector remains largely male-dominant, with white males at the helms of management and black males making up the numbers for the non-managerial/professional occupations.

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Projected Economic Performance

- The sector is currently in a downscale since return on investments are extremely low. This affects costs in retail segments; employees receive "adjusted" salaries which are not proper increases. There are no real rewards in the sector, at present. Everything is measured against inflation and this impedes growth prospects where both workers and customers are concerned.
- Against the above, companies that can afford to do so will turn to robotics and automation, resulting in a quicker state of joblessness for many workers. Many companies have already instated more cost-effective ways of doing business.
    - In SA, however, machines and humans will create complementary environments for a longer time, since the social, political and economic climate of the country does not allow for a complete automated overhaul.

Other change drivers and trends that will impact the nature of the industry in coming years:

- The advancements in international supply chain, currently happening at an incredible pace.
    - FIATA, CIPS and other internationally accredited transportation courses are setting the tone for the industry.
    - SA looks to Australia and similar developed countries as benchmarks; this is a positive influence as the standards the country has to match are of high regard.
- The demands on the industry to become dynamic and flexible to the changing economic and technological environment; this includes re-skilling workers.

KEY CHALLENGES

Multi-modal or Inter-modal transport systems are also challenged to become more flexible and digitised. As industries are becoming more advanced, customers are increasingly seeking new and higher-level solutions. Therefore, transportation services, such as Forwarding & Clearing, that makes use of a complex network of supply chain and distribution operations, would have to integrate ICT into their systems to ensure efficiency and sustainability.

The challenges influenced by emerging change drivers in the sector through the stakeholder engagements are as follows:

- The need to re-engineer skills to accommodate the growing demands and capabilities of the evolving environment
- The demands of an increasingly digitally-motivated environment
- The ability to afford new technologies
- Changes in processes of systems and operations are increasingly necessary
- The need to update and maintain skills qualifications to ensure they are relevant to the industry:
    - Skills are becoming more strategic and multi-purposed. Due to due-processes that need to be followed in implementing new qualifications and skills programmes, SETAs struggle keep up with the requirements forcing many occupations to become redundant.
- SARS custom legislations:
    - SA is party to the global customs organisations that make the rules; SARS customs are not "up to scratch" in this regard
- Compliance with ever-changing international legislation and conventions
- Improving infrastructure for better operational efficiency:
    - This is a land side challenge. Corrosion of materials and equipment is a major problem. If equipment is not properly maintained and upgraded, they affect the efficacy of business and the ability to perform activities.
- Competition from African countries enhancing their ports and containerships:

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- Kenya are digging deeper harbours for larger containers which will increase business/supply into central Africa;
- Namibia has developed newly dredged harbours, which are an earlier port stop against SA's;
- The development of inter-regional Railways is also likely to see SA being bypassed as a trade and business stop.

- Competition from virtual supply chain companies such as Amazon and Fedex are a threat to the industry since they have the capacity to do everything in-house.
- Terrorism and terrorist threats
- Global trade demands:
  - Ports are becoming hubs for use of trade by container for high-value commodities. In many developed parts of the world this has resulted in a reduction of the break-bulk and bulk market.
- Research and Development (R&D) becoming critical to keep up with international benchmarks established by the EU, China and the Middle East as the current international trade gatekeepers.

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6.3.5.2 FREIGHT HANDLING PROFILE

This sub-section aims to profile the Freight Handling industry through insights gained during the extensive primary data gathering exercise. Aspects profiled include:

- Freight Handling businesses
- The different role-players active within the Freight Handling industry, and their respective functions
- Growth trends experienced within the Freight Handling industry
- Specific challenges faced by the Freight Handling industry

BUSINESS PROFILE

In order to gain perspective on the businesses that operate within the Transport Sector, surveys were distributed to transport businesses (for more detail on data collection, sample sizes and confidence levels, please refer to ***Section 2*** Research Approach).

Results pertaining to Freight Handling Businesses are discussed according to the following aspects:

- Business size
- Geographic distribution
- Employment profile
- Past employment trends and future employment outlook

BUSINESS SIZE

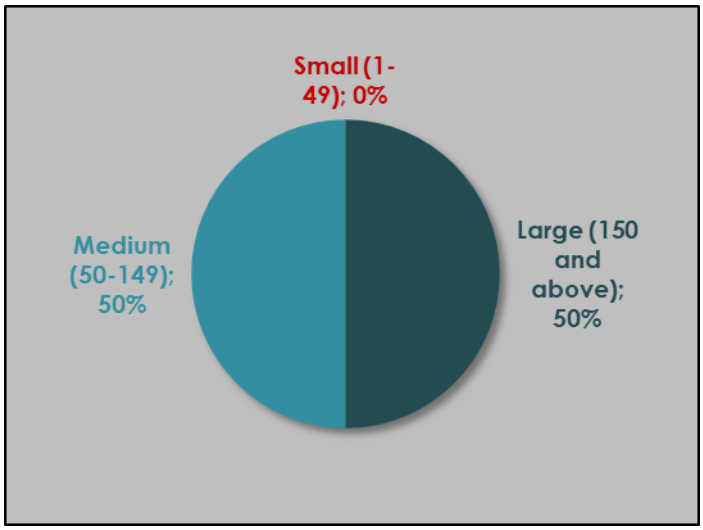

Figure 6-68: Freight Handling Business Size

Responding businesses were classified according to the number of people employed.

Figure 6-68 shows that half of responding businesses are classified as large (employing 150 or more people) and half are medium (employing between 50 and 149 people).

None of the responding businesses are classified as small (employing between 1 and 49 people). This however does not mean that no small businesses are active in the Freight Handling sector, only that there were no small businesses taking part in the survey.

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GEOGRAPHIC DISTRIBUTION

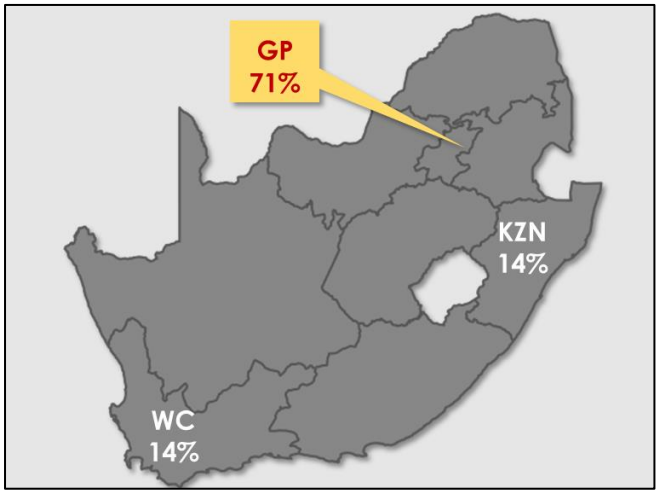

Figure 6-69: Geographic distribution for Freight Handling businesses (head office)

The geographic distribution of responding businesses were determined by the location of the businesses' head offices.

Approximately 71% of responding businesses are based in Gauteng, with 14% located in KwaZulu-Natal and the Western Cape respectively.

EMPLOYMENT PROFILE

Error! Reference source not found. below illustrates the average occupation distribution for responding Freight Handling businesses. The results show that 24% of people employed in this industry are clerical support workers, followed by 21% who are plant and machinery operators and assemblers. These two occupations groups make up almost half of the industry.

Skilled agricultural, forestry, fisheries, crafts and related trades make up 15% of the industry, while elementary occupations make up approximately 14%. Approximately 10% of employees are classified as technical and associate professionals, 8% are managers and 4% are professionals and services and sales workers respectively.

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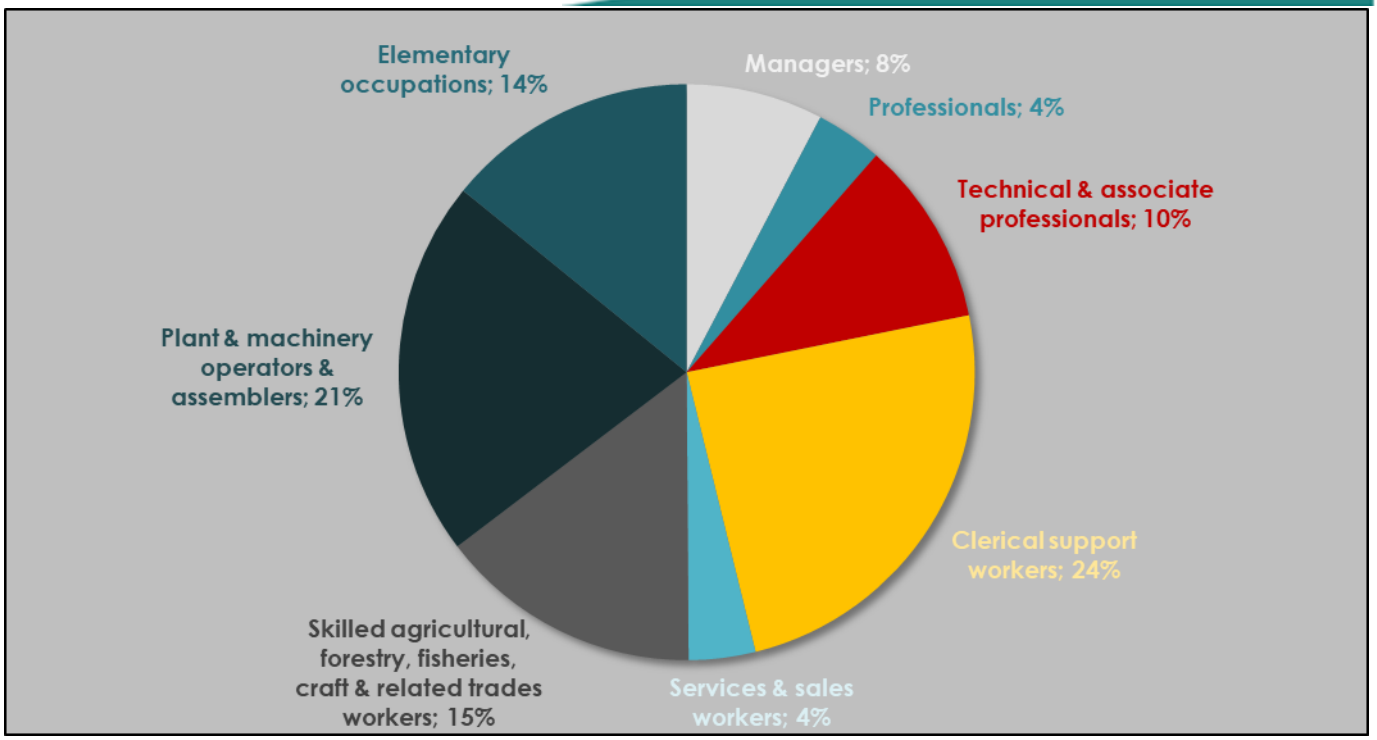

Figure 6-70: Freight Handling Business average occupation group distribution

Source: UE 2018

PAST EMPLOYMENT TRENDS AND FUTURE EMPLOYMENT OUTLOOK

Responding businesses were asked to reflect on the employment trends experienced over the past five years and to give an indication of employment trends expected for the next five years. The number of Freight Handling businesses that responded to this question was not adequate to be representative.

Responding businesses did however indicate that for them, employment did not decline over the past five years, and the future outlook is very positive, with no declines in employment numbers expected for any of the occupation groups.

ROLE-PLAYERS

There are a number of role-players that impact the Freight Handling sub-sector, and this includes statutory or authority bodies; industry associations or representative bodies; labour unions and representatives; as well as a number of other entities that have an indirect but crucial role in the workings of the sub-sector.

In the Freight Handling sector, SARS has been identified as a major role player, with the implementation of the new Customs Act. SARS, being the custodian of the new act, is identified as a constituent that impacts skills development by slowing down progress. It appears that key departments within SARS work in silos and this results in a stop-and-go approach as far as interventions with transport associations and organisations go. The Tactical Intervention Unit (TIU) specifically seems to fall prey to the practices described. Moreover, in-depth knowledge of the needs of the transport industry and its skills and training development agenda is expected from the people who interact with training providers and organisations in the industry.

A lack of skills and knowledge across the board, both by people working the industry and those employed in the industry as workers, impedes economic growth and the development of skills. Government legislation, it is suggested, should enable skills development agendas that cater to everyone on the spectrum that can contribute to the overall economic health of the country. This means offering the

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appropriate level of training to those who have a qualification, the semi-skilled with some formal education, and not neglecting the unskilled with little to no formal education.

The key role-players identified in the Freight Handling sub-sector are as follows:

STATUTORY AND AUTHORITY BODIES

- *Transnet National Ports Authority (TNPA)*
  TNPA, a division of Transnet Limited, is mandated to control and manage all eight commercial ports on the 2954km South African coastline by providing port infrastructure and marine services (Transnet, n.d.).

- *Department of Transport (DoT)*
  The Department of Transport is responsible for conducting sector research, formulating legislation and policy to set the strategic direction of sub-sectors, assigning responsibilities to public entities and other levels of government, regulating through setting norms and standards, and monitoring implementation (National Government, 2018).

- *South African Chamber of Commerce and Industry (SACCI)*
  The SACCI is a Chamber movement consisting of almost 50 constituent Chambers for business people. The SACCI membership comprises about 20 000 small, medium and large enterprises across the county and across economic sectors (SACCI, n.d.)

INDUSTRY ASSOCIATIONS/REPRESENTATIVE BODIES

- *The South African Institute of Materials Handling (SAIMH)*
  The SAIMH is a non-profit organisation that provides education in materials handling, warehousing and logistics (SAIMH, 2012).

- *National Bargaining Council for the Road Freight and Logistics Industry (NBCRFLI)*
  Governed by the Labour Relations Act of 1995, the NBCRFLI allows for employer and employee organisations to establish a bargaining council for an industry and area. Through collective bargaining, trade unions and employer organisations, which are party to the Council, the NBCRFLI are able to negotiate matters that are of mutual interest to the Road Freight and Logistics Industry (NBCRFLI, 2015).

- *South African Express Parcel Association (SAEPA)*
  SAEPA is a non-profit organisation representing the interests of the express parcel transport industry by communicating positions to legislative and regulatory officials and promoting the use of express delivery services (Transport Forum, n.d.).

- *Road Freight Association (RFA)*
  The RFA supports its members who are in main road service providers. RFA is a facilitating body and influences state of industry, rates, road infrastructure, road safety, freight security, driver's interests, cross border transport, education, health, etc. (Transport Forum, 2018)

- *Rail Road Association (RRA)*
  RRA lobbies relevant stakeholders for independent, sound, objective and technical information to enable decision makers to make sound decisions in the enters of the environmental impact by transport (Transport Forum, 2018).

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- *National Stevedoring Association*
- *Transport and Logistics Employer Association*
- *The Cape Port Producers' Association (CAPPA)*

LABOUR REPRESENTATIVES/UNIONS

- *South African Transport and Allied Workers Union (SATAWU)*
  SATAWU aims to defend rights of workers and aims to ensure that workers standards of living are improved. It guards against unfair labour practices (Transport Forum, 2018)

- *National Union of Metal Workers of South Africa (NUMSA)*
  Formed in 1987, NUMSA is the biggest metalworkers trade union in South Africa affiliated with the following sectors: engineering, motor, auto/tyre, and electronics (NUMSA, 2013).

- *Democratised Transport Logistics and Allied Workers Union (DETAWU)*
  Formed in 2015, DETAWU is a single global partnership trade union that fights for equitable redistribution of the economy and genuine economic empowerment of workers in various economic sectors (DETAWU, 2018).

- *The Congress of South African Trade Unions (COSATU)*
- *South African State and Allied Workers' Union (SASAWU)*
- *Southern African Confederation of Agricultural Unions (SACAU)*

OTHER ROLE-PLAYERS

- *Business Unity South Africa (BUSA)*
  Formed in 2003, BUSA is a representative and unified organisation for cross-cutting organised business interests in SA and consists of about 35 organisational members. BUSA has a subcommittee dedicated to Trade, Transport & Logistics (BUSA, 2018).

- *SPAR Distribution Group*
- *JCC Transport*

GROWTH TRENDS

The demand for transportation services that are efficient and economical is continually growing as technology is at the forefront of management and organisational systems. Multi- and inter-modal transport systems will therefore grow to be a favourable business option as it leverages on some of the emerging practices such as reduced costs, and integrated systems, for example. The movement and supply of freight (commodities and cargo) is important to the both the Transport industry and the economy. Inter-modal activities constitute a large component of the country's overall GDP. Auxiliary transportation services various business sectors across the economic sectors; the importance of auxiliary services cannot be overstated.

The change drivers identified through the stakeholder engagements can be described according to three reoccurring themes, namely technology, transformation and projected economic performance.

Technology
The Freight Handling sector, much like Road Freight and Forwarding & Clearing, will be affected by advancements in technology and digitisation trends characteristic to the Fourth Industrial Revolution (4IR).

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Many activities in the sector are already being done electronically including scheduling. Emerging trends include the following:

- Data usage or smart information
- Blockchain technology
- The Internet of Things (IoT) for tracking and communication purposes
- Drones and robotics to support a virtual supply chain, warehousing and distribution
- Eco-friendly systems that are less industrial and hazardous to the environment
- Cameras, surveillance and increased security

Transformation

The Freight Handling industry is mostly male dominated, comprising a mostly aging workforce (50+) with a labour profile of low to semi-skilled people. The sector appears to be slow to rectify the skewed demographics in the industry, nor does it have programmes or facilities in place to transfer skills from the older generation to younger people, (black) women, and PwDs. This is probably because there are not many youths or previously disadvantaged groups employed in the industry. Those that are, are on rotational or cyclical temporary contracts. They are trained, hired for contracting jobs, but never placed long enough to absorb real skills and experience necessary to ensure the industry's longevity.

Projected Economic Performance

Freight handling is an off-shore inter-modal transportation activity that links the Maritime sector with other freight-related activities throughout the supply chain. Major players in the sector include companies such as Imperial Logistics that will remain profitable throughout evolving changes, while most stevedoring companies are shrinking. Many companies cannot keep up with labour wages increases and port tariffs fluctuations. According to industry stakeholders consulted, many international companies are also choosing to export and import through neighbouring Mozambique, which offers cheaper port tariffs as there is less congestion on routes and harbours compared to those SA's major ports, such as Durban, for example. Other ports that are dominating the market and SA is losing out to is Dar es Salaam in Tanzania and Vavish bay in India. Another limiting factor on the economic performance of the industry is the exchange rate, with the Rand doing very poorly in recent years.

The sector already employs mostly casual labour, since employment in the industry mostly relies on the availability of ships and the quantities of trade happening at any given moment. The new labour law states that workers employed for at least three months should be considered for permanent employment. The Freight Handling sector perceives this as not realistic considering the nature of the work, which is of a temporary nature. However, the expenses involved in cyclical employment far outweighs its benefits, since employees constantly need to undergo training. Looking forward, it seems that the use of technological and digital advancements would aid in the economic viability of the sector, since these can be instated periodically at a once-off cost. Whether the South African sector can make use of the new developments advantageously is yet to be seen.

KEY CHALLENGES

There is space in the market for multi- or inter-modal transport to become competitive as projections indicate that freight will be moved by higher volumes in the future and it is already established that road transport will not be able to carry the load, while Rail transport requires somewhat of an infrastructure revival to compensate for its ailing systems in recent years.

The challenges influenced by emerging change drivers in the sector identified through the stakeholder engagements are as follows:

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- The biggest employers in the sector is in Richards Bay, due to the demand for coal exports. However, the rural areas in the KZN have a lot of potential to see the industry develop and expand. These areas do not receive a lot of attention and are failed due to:
    - The absence of training providers
    - Not all TVETs offer transport and logistic related courses
    - In many cases, TVET lecturers themselves require upskilling
    - Lack of capacity in local municipalities to absorb the required 30% into on-the-job training
    - Political interferences; the objectives of training and skills development in these areas are motivated by political agendas and who gets the credit. The learners get the short end of the stick because their needs, or the industry's, are never sufficiently met.
- Lack of skills in the sector is a major issue in an evolving environment. There is a need to update and maintain skills qualifications to ensure they are relevant to the industry.
- The demands of an increasingly digitally-motivated environment
- Competition of African and international countries with more efficient ports and less expensive tariffs
- Lack of skills transfers
- An aging workforce

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7. THE TRANSPORT SECTOR LABOUR AND SKILLS PROFILE

This Section considers the labour and skills profile for the Transport Sector. This section is largely informed by the primary data inputs gathered combined with the results gained from the skills demand forecasting model.

7.1 SECTOR-WIDE OVERVIEW

Inputs gathered from role-players, as well as secondary data sources, estimate the number of people employed within the Transport Sector at approximately 800 000. It was further highlighted that most occupations contained within the Transport sector relate to low and semi-skilled occupations.

The table below gives an indication of the 2018 employment figures used as the baseline for the skills demand forecasting. Figures were used based on a combination of official, reported data (StatsSA, Quantec), as well as inputs from industry stakeholders and alternative data sources to verify the figures (such as eNatis, annual reports etc.). For additional information on the methodology and moderation of these figures, Annexure A can be consulted.

Table 7-1: Forecasted employment estimate for the Transport Sector

Chamber	Employment estimate 2018	Distribution
Road Passenger	40 931	5%
Road Freight	74 480	9%
Taxi	368 382	46%
Rail	91 681	11%
Aerospace	43 083	5%
Maritime	4 021	0.5%
Freight Handling	147 427	18%
Forwarding & Clearing	36 553	5%
Total	**806 558**	**100%**

Source: UE 2018

Overall, the transport sector acts as a catalyst for the rest of the economy. As such, it was communicated that the transport sector is very sensitive to changes in the economy, and vice versa. The transport industry is influenced by international trends, specifically related to automation. However, in South Africa, the industry and the economy face many challenges such as high unemployment, underfunding of infrastructure and political pressure that technological advancements take longer to manifest.

Stakeholders did, however, indicate that although the South African transport industry lags behind international trends, upskilling and reskilling of staff is an important aspect. The risk of jobs becoming redundant in the near future and the threat of potential retrenchments are however a possibility that the industry is trying to mitigate.

Another concern that was highlighted by role-players and stakeholders in the transport industry, is the aging workforce, and the potential institutional knowledge that will be lost. At present, there is no formal

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institutional knowledge transfer programme, or mentorship programme run by an industry institution such as TETA. The table below gives an indication of the age dynamics of those employed within the Transport Sector, as reported by StatsSA:

Table 7-2: Age dynamics for the transport sector

Sub-Sector	15-34 (Youth)	35-49	50-59 (nearing retirement age)	60 and older (eligible for retirement)	Total
Maritime	51%	22%	18%	9%	100%
Aerospace	28%	51%	21%	0%	100%
Rail transport	40%	39%	16%	5%	100%
Road transport	38%	44%	13%	5%	100%
Support & Auxiliary transport services	41%	47%	10%	2%	100%
Total	**39%**	**44%**	**13%**	**4%**	**100%**

Source: StatsSA Quarterly Labour Force Survey 2016(Quarter 1) - Revised 2016

Although the greatest concentration of the transport workforce falls within the 15-34 and 35-49 age groups, the distribution of those nearing retirement age is significant. The sectors with the greatest concentration of those in the nearing retirement age category is Aerospace, Maritime and Rail.

7.1.1 OVERALL OCCUPATION DEMAND OVERVIEW

Urban-Econ has developed a sound skills demand forecasting model. The ultimate purpose of this model is to forecast the skills demand for the different occupations evident in each of the eight Chambers of TETA (for further details on the model, please refer to ***Section 2: Research Approach***).

The model provides a demand forecast for all occupations within the eight Chambers. These occupations were divided into priority occupations and non-priority occupations, as informed by TETA's career guide and WSP/ATR Hard-to-Fill Vacancy (HTFV) data.

The table below reveals the total anticipated jobs for each Chamber, as well as the net jobs (additional new jobs) that are anticipated between 2019-2023. The model provides three possible scenarios, i.e. low scenario (conservative growth), median scenario (most-likely growth) and high scenario (extreme growth).

Table 7-3: Projected Net and Total labour demand per Chamber

Chamber	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
		Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Aerospace	5%	49 838	50 890	51 942	7 496	7 807	8 118
Forwarding & Clearing	5%	42 285	43 177	44 070	6 360	6 624	6 888
Freight Handling	18%	170 543	174 143	177 743	25 652	26 716	27 780
Maritime	0,5%	4 652	4 750	4 848	700	729	758
Rail	11%	106 056	108 295	110 533	15 952	16 614	17 276
Road Freight	9%	86 159	87 977	89 796	12 959	13 497	14 035
Road Passenger	5%	47 349	48 349	49 348	7 122	7 417	7 713
Taxi	46%	426 142	435 138	444 134	64 097	66 756	69 415
Total	**100%**	**933 022**	**952 719**	**972 415**	**140 339**	**146 161**	**151 982**

Source: UE 2018

The overall projected jobs to be reached in 2023 is between 933 022 and 972 415, with the most likely number of jobs to be around 952 719. This means that the additional jobs to be created between 2019 and 2023 is projected to be between 140 339 and 151 982, with the most probable anticipated number of additional jobs to be about 146 161.

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Table 7-3 also indicates the overall occupation distribution between the eight Chambers. The table above reveals that the Taxi industry is projected to hold the greatest concentration of occupations for all the Chambers, with 46%. The Chamber projected to hold the smallest concentration of occupations is Maritime, with less than 1% share.

Table 7-4: Forecasted annual growth rate

Annual growth rate	
2019	3,6%
2020	3,5%
2021	3,4%
2022	3,3%
2023	3,2%
Average	**3,4%**

Source: UE 2018

The results from the labour demand model can be presented to provide a forecast of the annual growth rate for employment within the Transport Sector. These results are presented in the table to the left.

The annual average growth rate (based on the median scenario) between 2019 and 2023 are estimated to be approximately 3.4%.

The forecasted employment growth gives a good indication of the forecasted economic growth – as economic performance and employment are closely related, and in fact, economic performance are factored in employment and occupation forecasts, as presented through this model.

The results can also be displayed to give the percentage distribution of the anticipated share per OFO group. These are set out in the table below, which reveals that overall, the greatest concentration of anticipated jobs fall within the Plant and Machine Operators and Assemblers Group.

Table 7-5: Total labour demand distribution by occupation (2019-2023)

OFO Group	Aerospace	Forwarding & Clearing	Freight Handling	Maritime	Rail	Road Freight	Road Passenger	Taxi	Overall
Managers	4%	19%	8%	8%	5%	6%	3%	4%	**6%**
Professionals	2%	5%	4%	6%	5%	4%	2%	10%	**7%**
Technicians and Associate Professionals	16%	26%	11%	24%	8%	6%	3%	0%	**9%**
Clerical Support Workers	14%	30%	9%	6%	4%	14%	11%	10%	**10%**
Service and Sales Workers	28%	1%	3%	5%	4%	2%	10%	14%	**9%**
Skilled Agricultural, Forestry, Fishery, Craft and Related Trades Workers	10%	0%	12%	9%	12%	1%	6%	0%	**5%**
Plant and Machine Operators and Assemblers	5%	13%	36%	19%	52%	58%	62%	55%	**43%**
Elementary Occupations	21%	5%	16%	22%	9%	9%	4%	5%	**11%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: UE 2018

Figure 7-1 below graphically illustrates the total anticipated labour demand for all occupations between 2019-2023, as contained in Table 7-3.

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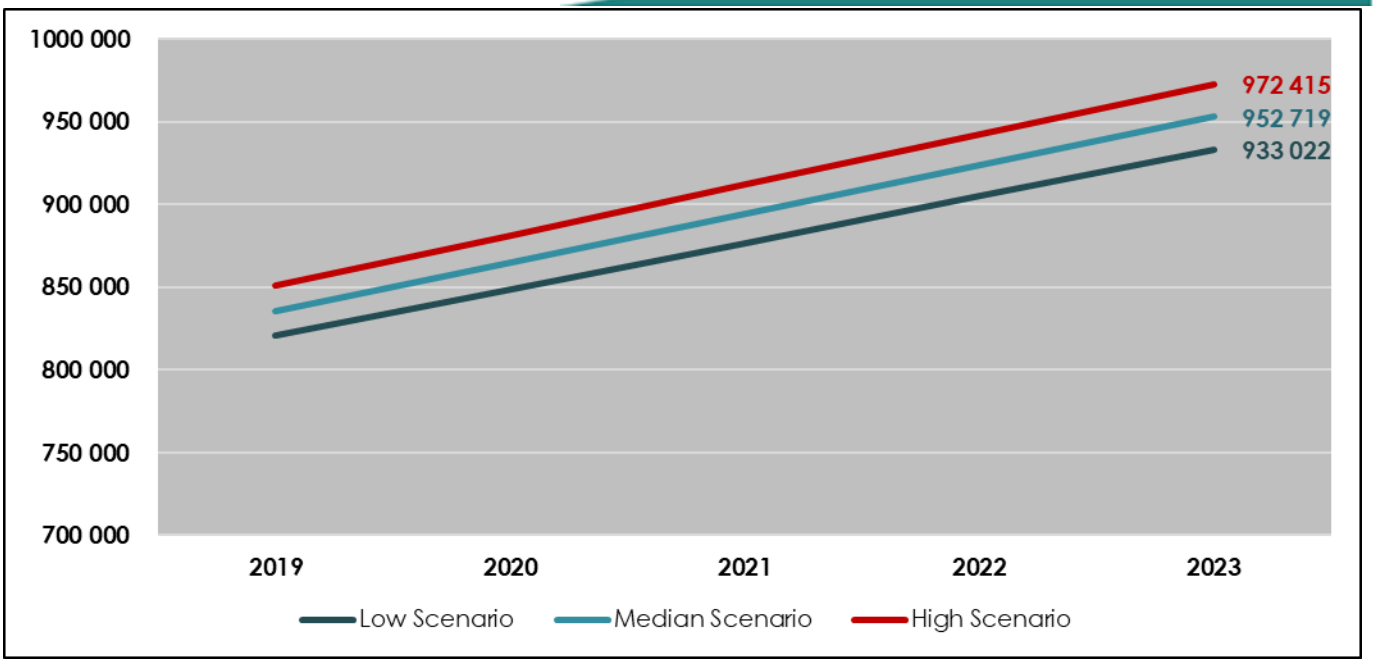

Figure 7-1: Projected total labour demand for all occupations (2019-2023)

Source: UE 2018

The graph above gives the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 820 582 jobs and 850 998 jobs in 2019 to between 933 022 and 972 415 jobs in 2023.

Figure 7-2 illustrates the anticipated additional jobs for each year from 2019 to 2023 for each scenario. The high scenario sees a slight decrease in the number of additional jobs each year, while the low scenario sees a slight increase in the number of additional jobs each year. The median scenario sees the anticipated number of additional jobs increasing by the same amount each year. The total number of additional jobs, as stated in Table 7-3, are derived by adding the additional jobs together for each year.

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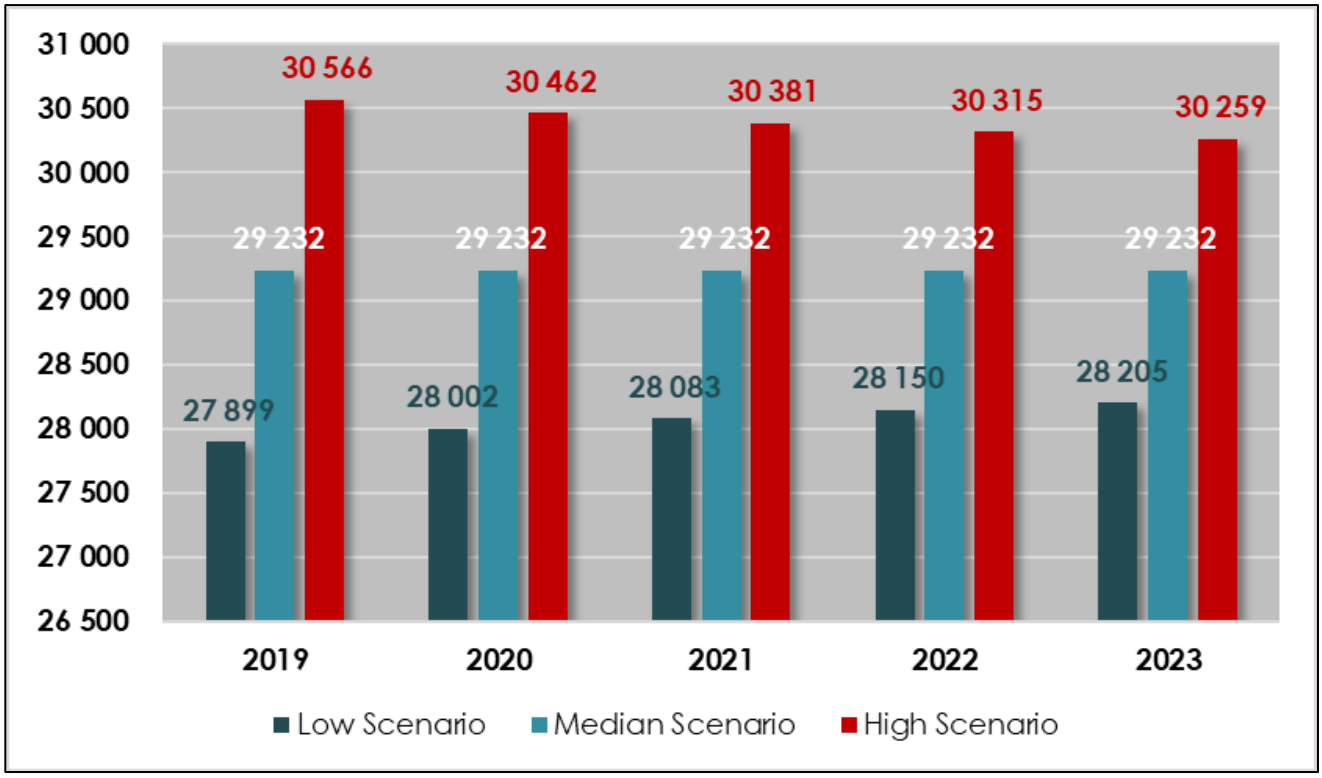

Figure 7-2: Projected Net (additional) jobs for all occupations (2019-2023)

Source: UE 2018

Figure 7-3 illustrates the net additional jobs anticipated for each Chamber. The figures illustrated below is based on the median scenario, which is the most likely scenario.

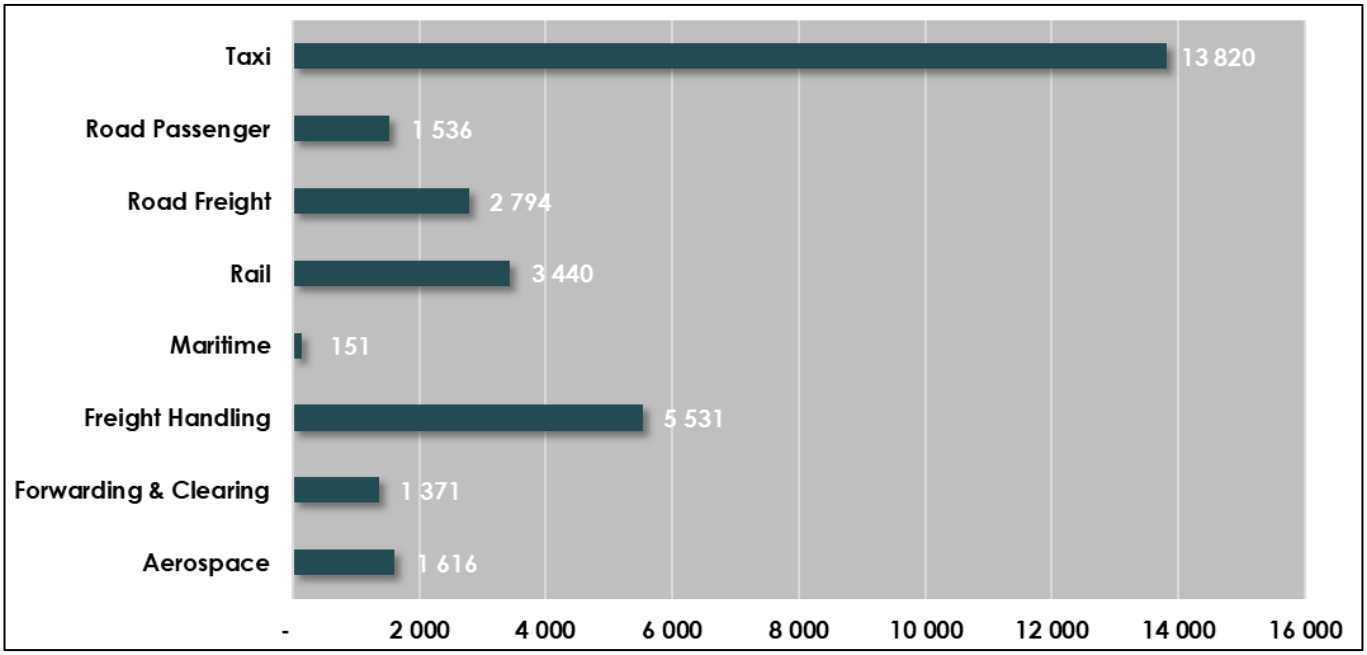

Figure 7-3: Net additional jobs for all occupations (2019-2023)

Source: UE 2018

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Through visually comparing the different Chambers and anticipated additional jobs for 2019 to 2023, the dominance of the Taxi Chamber and the minor contribution of the Maritime Chamber is immediately evident.

TOP PRIORITISED OCCUPATIONS ACROSS ALL CHAMBERS

The following table provides the net demand (additional jobs) figures for the top 25 prioritised occupations across all Chambers. The table furthermore provides the percentage share of all prioritised occupations and the percentage share of all occupations (both prioritised and non-prioritised occupations).

Table 7-6: Top 25 prioritised occupations

Top 25 prioritised occupations	Share of all prioritised occupations	Share of all occupations	Net (additional jobs)
1. Chauffeur	29%	12%	17 569
2. Taxi Driver	29%	12%	17 385
3. Truck Driver (General)	11%	5%	6 541
4. Train Driver	3%	1%	2 059
5. Flight Attendant	3%	1%	1 861
6. Railway Signal Operator	3%	1%	1 744
7. Bus Driver	3%	1%	1 572
8. Airline Ground Crew	2%	1%	1 179
9. Freight Handler (Rail or Road)	1%	1%	823
10. Aeroplane Pilot	1%	0,5%	760
11. Forklift Driver	1%	0,5%	723
12. Travel Consultant	1%	0,4%	600
13. General Clerk	1%	0,4%	582
14. Store Person	1%	0,4%	524
15. Electrician	1%	0,3%	500
16. Clearing and Forwarding Agent	1%	0,3%	456
17. Supply and Distribution Manager	1%	0,3%	376
18. Mechanical Fitter	1%	0,2%	364
19. Train Controller	1%	0,2%	346
20. Dispatching and Receiving Clerk / Officer	1%	0,2%	314
21. Aircraft Maintenance Mechanic	0,5%	0,2%	299
22. Diesel Mechanic	0,5%	0,2%	285
23. Welder	0,5%	0,2%	284
24. Electrical Engineering Technician	0,4%	0,2%	222
25. Warehouse Manager	0,3%	0,1%	209
Total (all prioritised occupations)			**60 535**

Source: UE 2018

The prioritised occupation with the highest net demand is Chauffeur, with approximately 17 569 anticipated additional jobs, followed by Taxi driver at 17 385. The top two prioritised occupations make up 29% of prioritised occupations and 12% of all occupations respectively.

It is important to note that these results are based on WSP/ATR submission data. The two occupations with the highest anticipated additional jobs (Chauffeur and Taxi Driver), come from the Taxi Chamber. The poor submission rate for the Taxi Chamber could present a skewed picture of the occupation and skills need. ***It is thus important for each Chamber to critically interrogate and moderate the forecasted results.*** The forecasted results are meant to guide the Chambers and to provide an indication of whether the priority focus areas are representative of the occupational demand, as expressed through the ATR results.

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TOP NON-PRIORITISED OCCUPATIONS ACROSS ALL CHAMBERS

The top 25 non-prioritised occupations are contained in the table below:

Table 7-7: Top 25 non-prioritised occupations

Top 25 non-prioritised occupations	Share of all non-prioritised occupations	Share of all occupations	Net (additional jobs)
1. Call Centre Salesperson	5%	3%	4 591
2. Engineering Production Systems Worker	4%	3%	3 769
3. Occupational Instructor / Trainer	4%	3%	3 673
4. Train Driver	3%	2%	3 098
5. Adult Education Teacher	3%	2%	2 755
6. Service Station Attendant	3%	2%	2 755
7. Railway Signal Operator	3%	2%	2 693
8. Dispatching and Receiving Clerk / Officer	3%	2%	2 510
9. Vehicle Detailer (Valet Servicer)	2%	1%	1 959
10. Truck Driver (General)	2%	1%	1 928
11. Delivery Driver	2%	1%	1 471
12. Railway Track Worker	2%	1%	1 374
13. Passenger Coach Driver	2%	1%	1 355
14. Travel Consultant	2%	1%	1 286
15. Corporate Services Manager	1%	1%	979
16. Office Cashier	1%	1%	979
17. Railway Track Worker	1%	1%	931
18. General Clerk	1%	1%	829
19. Tanker Driver	0,9%	1%	809
20. Import-export Administrator	0,9%	1%	805
21. Electrician	0,8%	0,5%	713
22. Delivery Driver	0,8%	0,4%	644
23. General Clerk	0,7%	0,4%	605
24. Operations Manager (Non-Manufacturing)	0,7%	0,4%	571
25. Train Controller	0,6%	0,4%	539
Total (all non-prioritised occupations)			**85 626**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that the top 10 non-prioritised occupations have higher net demand than the fourth to ninth prioritised occupations. This, along with the fact that fact that the Prioritised Occupations Share for half of the Chambers are below 50% indicates that the priority occupations focussed on by each of those Chambers may be too narrow. This implies that key or significant occupations may not be prioritised or receiving the necessary attention.

7.2 SUB-SECTORAL PROFILE

This Section considers the labour and skills profile for each sub-sector, in line with the Chambers, as demarcated to TETA.

Each sub-section is largely informed by the primary data inputs gathered combined with the results gained from the skills demand forecasting model. The current skills profile for each Chamber is revealed, followed by the prominent skills trends observed within each Chamber.

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The various challenges experienced with regards to skills development and skills retainment are discussed for each Chamber. Each sub-section ends off by providing a comprehensive breakdown of the anticipated additional occupations for the Chamber, both for prioritised and non-prioritised occupations.

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7.2.1 ROAD PASSENGER

The Road Passenger sub-sector is characterised by a labour profile of low to semi-skilled workers. The dominant occupation appears to be that of drivers, and the ones phasing out are related to clerical work. This section will provide an in-depth analysis of the sector's current labour and skills profiles, and the skills development trends and challenges it faces.

7.2.1.1 SKILLS PROFILE

Box 4: Road Passenger Skills Profile

Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Road Passenger sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated. There are many reasons why, but key among them are that the suitable people are not available or in the sector's labour pool; another reason is that they are available, but they do not meet the employment criteria. Additionally, the changing demands of the Transport industry are not easy to meet.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a particular job/occupation or the general nature of the business within the industry.

Following the definitions, Box 1 shows that managerial and engineering skills are perceived as critical but scarce in the Road Passenger sub-sector, along with professional and licensed drivers, which also makes

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the HTFVs list. The emphasis on professional drivers is supported by the skills gaps column which addresses the need for workers in the sector to be more aware of road use, to take better safety precautions, to comply with the rules of the law, to deliver better customer services, and to be nuanced in computerised technologies and communications.

This will obviously come with a shift in the industry to compensate drivers more adequately and to provide them with better incentives. Many look to the trucking segment for these reasons, which could aid in the scarcity of drivers for this sector. Dispatchers and Schedulers are critical but hard-to-find skills too, the latter being of importance since very few people are qualified to fill the role.

Against the skills and occupations that are in demand, it is worth noting the ones that currently dominate in the sector, for comparative insight. Drivers are said to account for about 70% of the workforce, followed by couch builders, route planners and schedulers. These are also the occupations that are perceived to be under threat with advancements of the Fourth Industrial Revolution (4IR). Mechanics and electricians, although not easy to be outmoded by technology, are occupations that are in current domination in the Road Passenger sector.

7.2.1.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Road Passenger sub-sector.

Skill development is crucial for any country looking towards achieving sustainable economic growth and development in the present and the foreseeable future. Thus, key economic industries should be able to identify the skills the country needs most in order to acquire and develop these accordingly. Following international developments and trends to project skills needs and professional models are important too.

Skills trends

The skills and occupations that will become prominent in the future in light of current trends are professional drivers, safety regulators, transport managers, transport economists, and environmentalists. There is an emphasis on workers becoming more knowledgeable about the industry, its regulations, societal and environmental impact in addition to expanding their job roles.

Developing skills towards these objectives would include the strategic interaction of major role players in the industry. It is suggested that all the sub-sectors in the Transport industry is involved in these proceedings to ensure that everybody grows along the same trajectory and complements each other as an economic unit. The 4IR is an era that not only blurs the physical and digital, but also moulds most industries into each other, fostering a culture of interdependence to stay afloat and to get ahead.

The occupations receiving the biggest training spend are artisans, diesel mechanics, body builders, auto electricians, and a small quantity of drivers are being trained towards professional qualifications. The bigger bus companies often have their own in-house training providers and academies and can therefore afford to spend on developing these required skills and occupations.

As far as skills training as a trend, the importance of it being an ongoing practice cannot be overstated. Insurance companies require drivers to be trained and have driving experience between 5-8 years, particularly in the freight segment of the sector. Ongoing skills training is necessary too for the industry to adapt to technology related advancements; infrastructural changes, such as the BRT dedicated lanes and traffic signals; safety training; and service delivery. Continuous skills training leads to increased productivity and opens the earning potential of workers.

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Challenges

The skills development challenges currently facing the industry include:

- Training authorities and providers not fulfilling obligations
- The disconnect between the Quality Council for Trades and Occupations (QCTO) and the Department of Higher Education (DHET) in terms of the training needs of the industry and the occupational qualifications standards they are required to meet in order to obtain certification. Length of courses and the relevance of modules or curricula are issues that came up.
- Most workers in the sector are endowed with entry-level education only and do not have the required education to enable them to be upskilled.
- Training materials are often at a higher level than the audience it is designed for, e.g. language that is difficult to interpret or not accessible to the sector's labour profile of low to semi-skilled workers.
- TETA not doing enough to adapt to evolving training needs. Implementing an e-learning platform will make learning quicker and accessible to most since most people, especially the younger group, have smartphones.
    - TETA's research gaps impedes on how effectively and quickly SA's industry is kept up-to-date. Interventions from the SETA have to be more innovative and proactive.
    - TETA's focus is perceived to be on the status quo of training and not at addressing the real needs of the Transport sector and its future. The industry should be able look to TETA for guidance, not the other way around.
- The sector is not made attractive to youth nor are scarce occupations such as artisans made attractive to the youth.

7.2.1.3 FUTURE DEMAND

An overview of the skills demand forecasting model results for the Road Passenger Chamber are contained in Table 7-8. The results show that the Road Passenger Chamber holds 5% share of the overall anticipated occupations within the TETA landscape. The table also provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023. The total anticipated jobs range between 47 349 and 49 384 (low and high scenario) with 48 349 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 7 122 to 7 713, with 7 417 being the median scenario, and most likely.

Table 7-8: Projected Net and Total Labour Demand for the Road Passenger Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Road Passenger	**30%**	5%	47 349	48 349	49 348	7 122	7 417	7 713

Source: UE 2018

Table 7-8 also provides the prioritised occupation share for the Road Passenger Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Road Passenger Chamber are illustrated in **Error! Reference source not found.**. The anticipated additional occupations are revealed per year for a low, median and high scenario. The number of new jobs expected for 2019 for range between 1 416 and 1 551.

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The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 1 431 and 1 536.

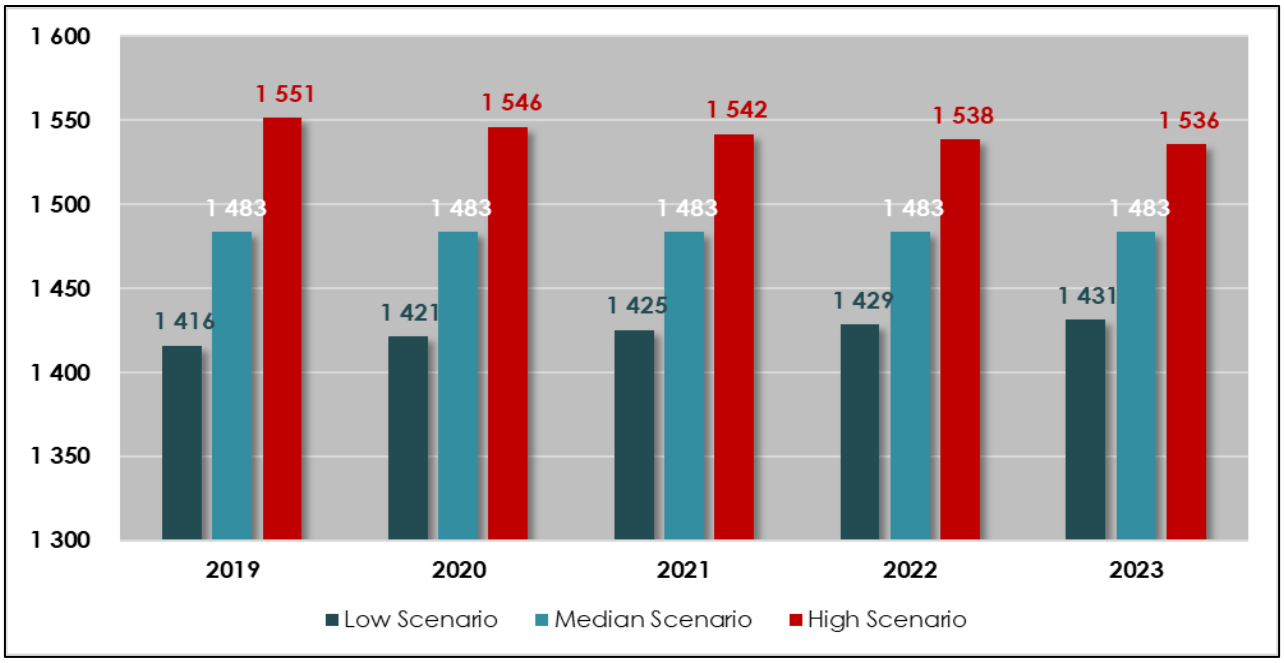

Figure 7-4: Projected Net (additional) jobs for the Road Passenger Chamber (2019-2023)

Source: UE 2018

Figure 7-5 below illustrates the total anticipated labour demand for the Road Passenger Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 41 643 and 43 187 jobs in 2019 to between 47 349 and 49 348 jobs in 2023.

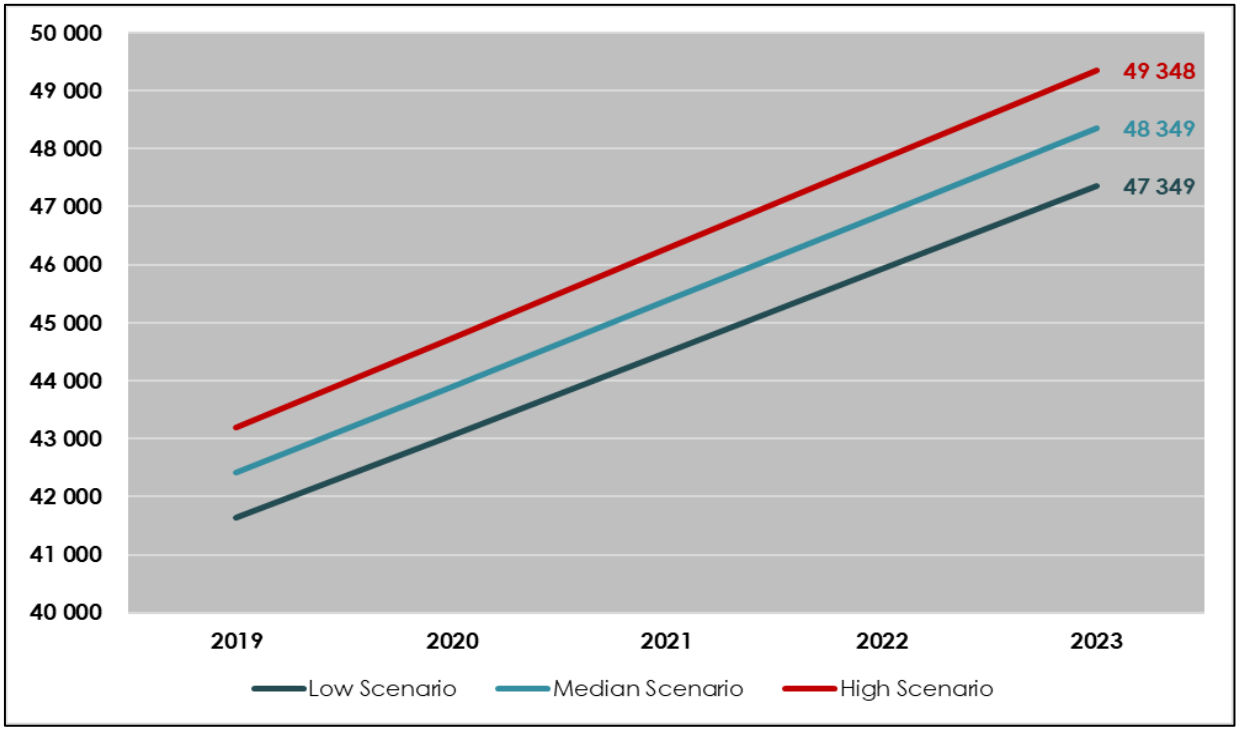

Figure 7-5: Projected total labour demand for the Road Passenger Chamber (2019-2023)

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Source: UE 2018

PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Road Passenger Chamber. Table 7-9 reveals that 26 occupations were prioritised for this Chamber, which make up approximately 30% of the Chamber share. The **bus driver** occupation makes up **21% of the total Chamber share**. The remaining prioritised occupations each hold a small share which may indicate that the priority occupation focus may need to be adjusted.

The total top prioritised jobs identified for the Road Passenger Chamber adds up to 14 706 anticipated jobs, based on the median scenario forecasted figures.

Table 7-9: Road Passenger: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Bus Driver	21%	10 245	1 572
Diesel Mechanic	3%	1 274	195
Transportation Electrician	2%	812	125
Dispatching and Receiving Clerk / Officer	1%	538	82
Ticket Seller	1%	319	49
Production / Operations Supervisor (Manufacturing)	0,5%	231	35
Transport Operations Inspector	0,4%	172	26
Road Transport Manager	0,3%	144	22
Bus Hostess	0,3%	122	19
Finance Manager	0,2%	104	16
Human Resource Advisor	0,2%	99	15
Personnel / Human Resource Manager	0,2%	93	14
Transport Conductor	0,2%	89	14
Receptionist (General)	0,2%	80	12
Charter and Tour Bus Driver	0,2%	78	12
Production / Operations Manager (Manufacturing)	0,1%	61	9
Personal Assistant	0,1%	50	8
Sales and Marketing Manager	0,1%	43	7
Corporate Services Manager	0,1%	38	6
Mechanical Engineer	0,1%	34	5
Accountant (General)	0,1%	24	4
Automotive Motor Mechanic	0,1%	24	4
Skills Development Facilitator / Practitioner	0,04%	17	3
Logistics Manager	0,02%	11	2
Health and Safety Manager	0,01%	4	1
Assessment Practitioner	0%	-	-
Train Examiner	0%	-	-
Total	**30%**	**14 706**	**1 572**

Source: UE 2018

Figure 7-6 below illustrates the net additional jobs anticipated for each of the top 15 prioritised occupations (as contained in the table above). The figure reveals the dominance of the bus driver occupation as compared to the other prioritised occupations.

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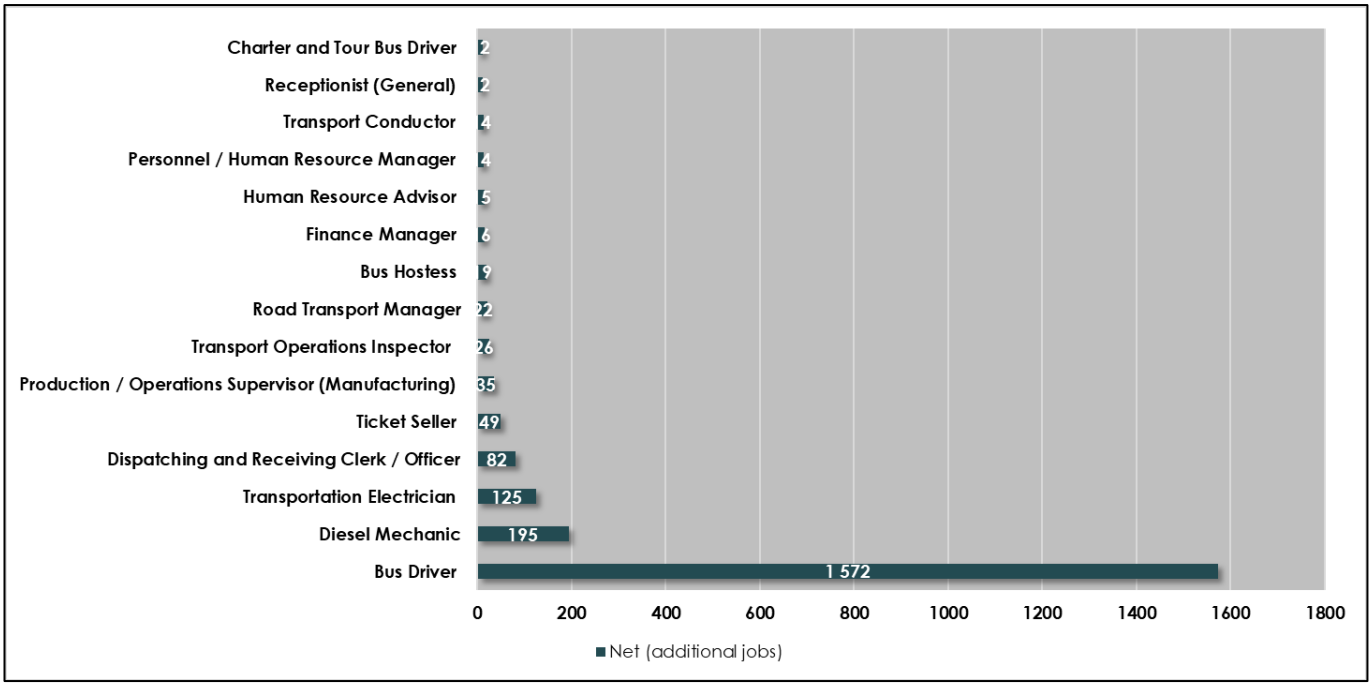

Figure 7-6: Net additional prioritised jobs for the Road Passenger Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Road Passenger Chamber are listed in Table 7-10 below.

Table 7-10: Road Passenger: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Delivery Driver	20%	9 590	1 471
Passenger Coach Driver	18%	8 834	1 355
Armoured Car Escort	7%	3 228	495
Bank Worker	6%	2 869	440
Truck Driver (General)	2%	881	135
General Clerk	1%	691	106
Mechanic`s Assistant	1%	464	71
Ticket Collector	1%	463	71
Security Officer	1%	407	62
Bank Teller	1%	285	44
Total	**57%**	**27 711**	**4 251**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that the **delivery driver** occupation and **passenger coach driver** occupation collectively occupies a greater share of anticipated additional jobs than all the prioritised occupations. The fact that the top 10 non-prioritised occupations make up almost 60% of the occupation share indicates that the priority focus for the Chamber is too narrow.

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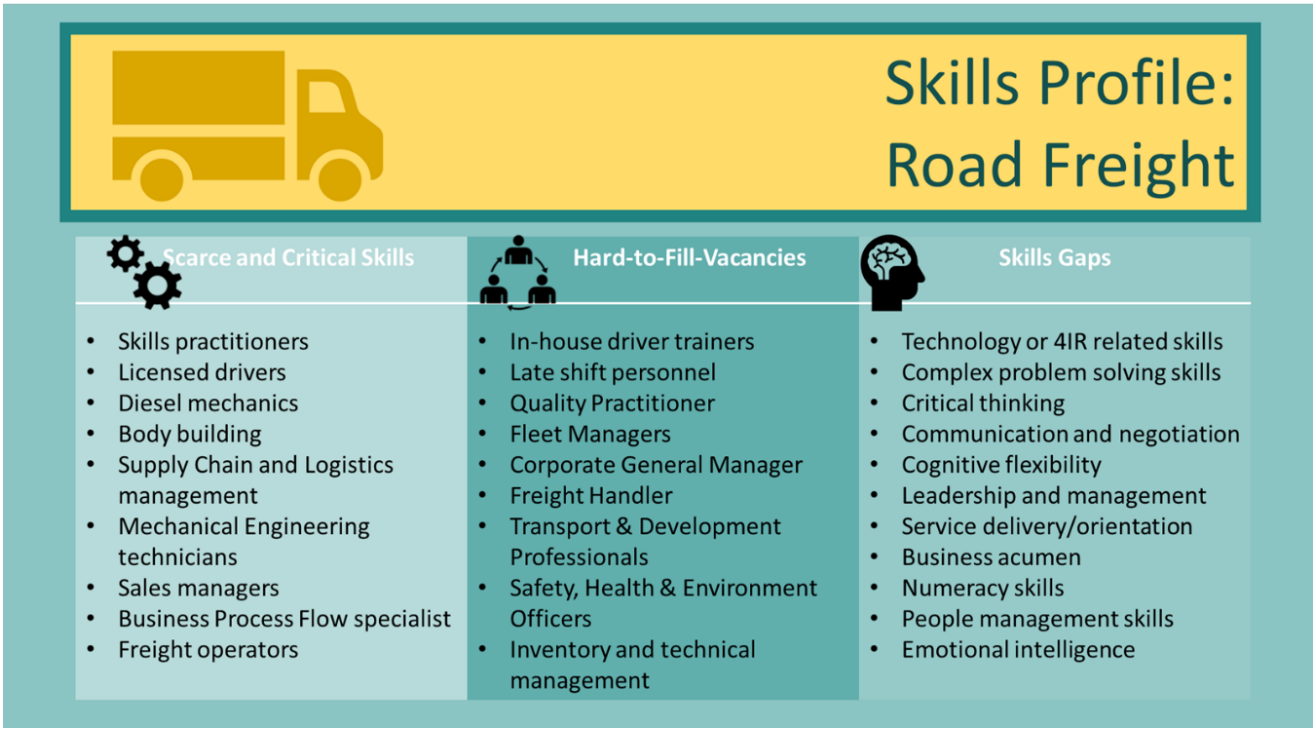
7.2.2 ROAD FREIGHT

According to the stakeholder engagements, there are at least 150 000 people employed in this sector, with 25% comprising foreign nationals. The Road Freight sub-sector is characterised by a labour profile +/- 60% semi-skilled to skilled workers. This section will thus provide an in-depth analysis of the sector's current labour and skills profiles, and the skills development trends and challenges it faces.

7.2.2.1 SKILLS PROFILE

Box 5: Road Freight Skills Profile



Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Road Freight sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

The scarce skills and the vacancies that are hard to fill for this sector are quite diverse. Many of the vacancies that are hard to fill comprise supervisory and developmental professions, while the scarce and critical skills shortages are those that are operational in nature. Both these columns' scarcity in skills and jobs are grounded by the skills gaps identified in the industry, which speaks to the absence of the

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competencies highlighted in the first two columns. Business acumen, communication and problem-solving skills are examples of competencies necessary for sales jobs, or freight operators, or supply chain management, and in the more supervisory and managerial roles.

It was strongly asserted in the stakeholder interviews that the underlying role of soft skills or skills gaps are necessary to develop the required competencies of workers in the industry. Knowing how to work with people and having numeracy skills are vital to most of the jobs in the sector and yet many of the workers battle in this regard. They are well-equipped to handle operational procedures, but the changing nature of the environment requires they are adept with more than just technical ability. The sector is growing into broad-based business that includes marketing and being able to sell the brand, its products and services.

Against the skills and occupations that are in demand or are developing, it is worth noting the ones that currently dominate in the sector, for comparative insight. The stakeholders engaged identify drivers, diesel mechanics, operations managers, controllers, project managers, industrial engineers, pharmaceuticals, warehousing managers, packers and forklift drivers as those currently dominant in the sector,

7.2.2.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Road Freight sub-sector.

The impact of skills development on the Transport industry and across sub-sectors in the past 5 years appears to have been positive. Some of the positive outcomes recognised include:

- Increased productivity
- Skills and staff retention
- Assisted transformation
- Credibility of qualifications
- Entrepreneurship (more success observed in industries with low-entry barriers)
- Professionalisation of occupations

Bigger companies in the industry such as Imperial Logistics and Shoprite have taken on in-house training programmes for their drivers. Imperial Logistics continue to work with various applicable SETAs to ensure the needs of the industry are met through their learning and training initiatives.

Skills trends

The Road Freight sector identifies the need to develop the skills gaps or soft skills necessary to allow workers to adapt to the changing needs of the environment and the demands of technology as well as integrated business processes.

Some of the trends identified in relation to skills and occupations in light of the emerging developments include having workers evolve into thinkers, ambassadors and as persons able to work alongside technologies such as drones, for example. Drivers will be required to have not only technology and technical expertise, but cognitive flexibility as well. The sector is already growing into demanding stronger analytical skills in roles such as machine learning experts or data analysts to predict and handle big data. Production managers are moving into product designing and being more creative; logistics managers are being geared towards client-centric consultants; and industrial engineers are driving continuous improvement. All these shifts in occupations, skills and competencies are not obtainable without workers being developed with softer skills, or meeting the skills gaps demands.

To compensate for the evolving nature of work in the sector, up-skilling and reskilling people will become fundamental to business processes. Strategic thinking and business with foresight will be key to this end.

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There is also a shift within the industry towards emotional intelligence alongside technical ability and the traditional set of skills. Fortunately, industry leaders show a willingness to grow and learn along with their staff and this reflects positively for skills development in the sector. Funds also seem to be readily available in some pockets. It is hoped that a culture of learning can be instilled in the sector and that this has a knock-on effect for other segments in its economy.

Challenges

The skills development challenges currently facing the industry include:

- Legislative requirements not being accommodative enough
- Non-participation from key stakeholders
- Lack of quality basic education present in up-skilling and reskilling initiatives
- The Recognition of Prior Learning process (RPL)
- The minimum entry requirements impact the quality practices of segments such as health and safety
- Unqualified skills development facilitators
- Youth poorly affected by the lack of quality training, educations and skills
- The WSP/ATR requirements and audits
- Professional bodies' hindering influence on skills and development. They are required to sign off on everything that concerns the recognition of qualifications or the provisions of skills. This is perceived as time-consuming and cumbersome.
- No proper strategy in place to constitute the transformation agenda
- The fluctuating economy impacts training budgets
- Lack of resources
    - The sector reports that they are often required to work skills development into overtime or on weekends. This is both not feasible or conducive to addressing skills needs.
- Limitations on the service offering of the Transport SETA:
    - Lack of proper research and knowledge of the sector
    - Too traditional – SETAs have not changed their thinking since inception
    - A lot of bureaucracy/red tape
    - Lack of IT capacity – software should be user-friendly and simple to use
    - WSP/ATR data being captured manually affects speed and quality of delivery
    - Lack of funding and value partnerships; no proper alignment with what is provided against what is needed. Solid R&D would ensure TETA become providers of knowledge and info into its demarcated industries.
    - The requirements by the SSP are not accurate. This should be done against a proper Needs Analysis. Many people have been doing circular learnership and are not finding employment or gaining relevant experience. This needs to be addressed: review the current structure in place and see how it is not serving the needs of learners and the enterprise.

7.2.2.3 FUTURE DEMAND

An overview of the skills demand forecasting model results for the Road Freight Chamber is contained in the table below. The results show that the Road Freight Chamber holds 5% share of the overall anticipated occupations within the TETA landscape. The table also provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023. The total anticipated jobs range between 86 159 and 89 796 (low and high scenario) with 87 977 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 12 959 to 14 035, with 13 497 being the median and most likely scenario.

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Table 7-11: Projected Net and Total labour demand for the Road Freight Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Road Freight	62%	9%	86 159	87 977	89 796	12 959	13 497	14 035

Source: UE 2018

Table 7-11 also provides the prioritised occupation share for the Road Freight Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Road Freight Chamber are illustrated in Figure 7-7. The anticipated additional occupations are revealed per year, for a low, median and high scenario. The number of new jobs expected for 2019 for range between 2 576 and 2 823. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 2 605 and 2 794.

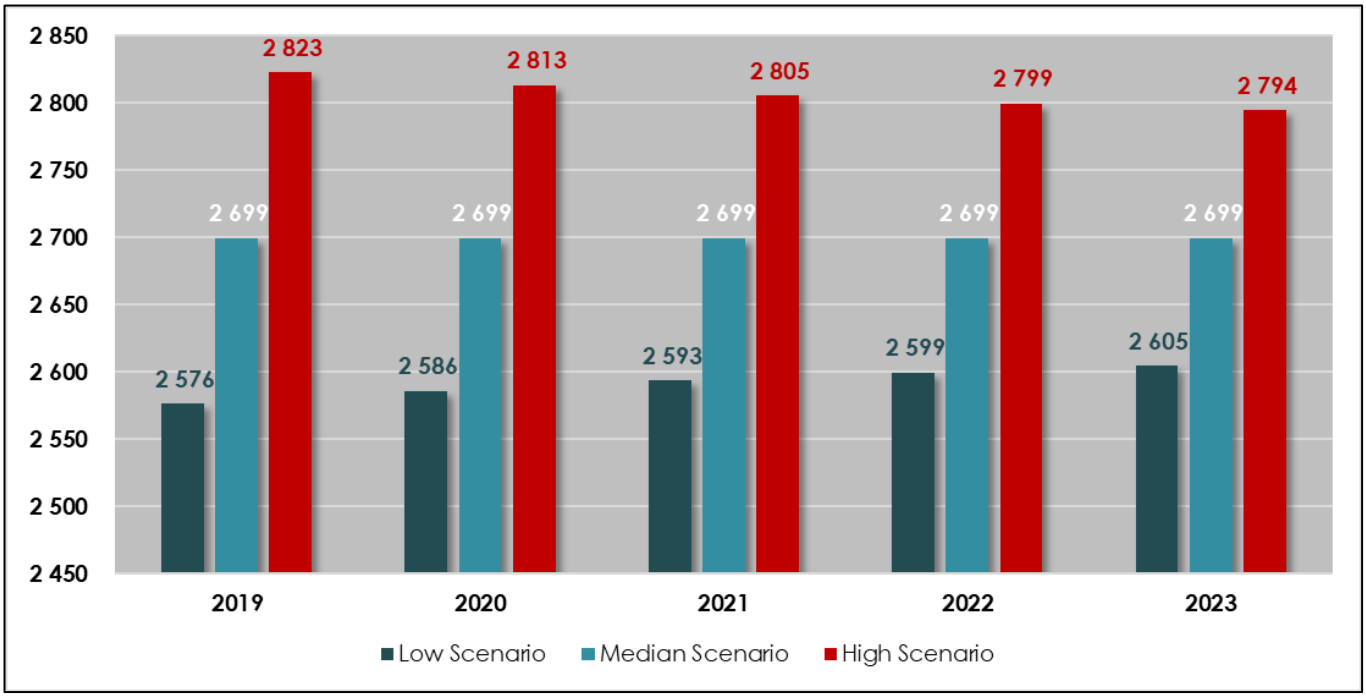

Figure 7-7: Projected Net (additional) jobs for the Road Freight Chamber (2019-2023)

Source: UE 2018

Figure 7-8 below illustrates the total anticipated labour demand for the Road Freight Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 75 775 and 78 584 jobs in 2019 to between 86 159 and 89 796 jobs in 2023.

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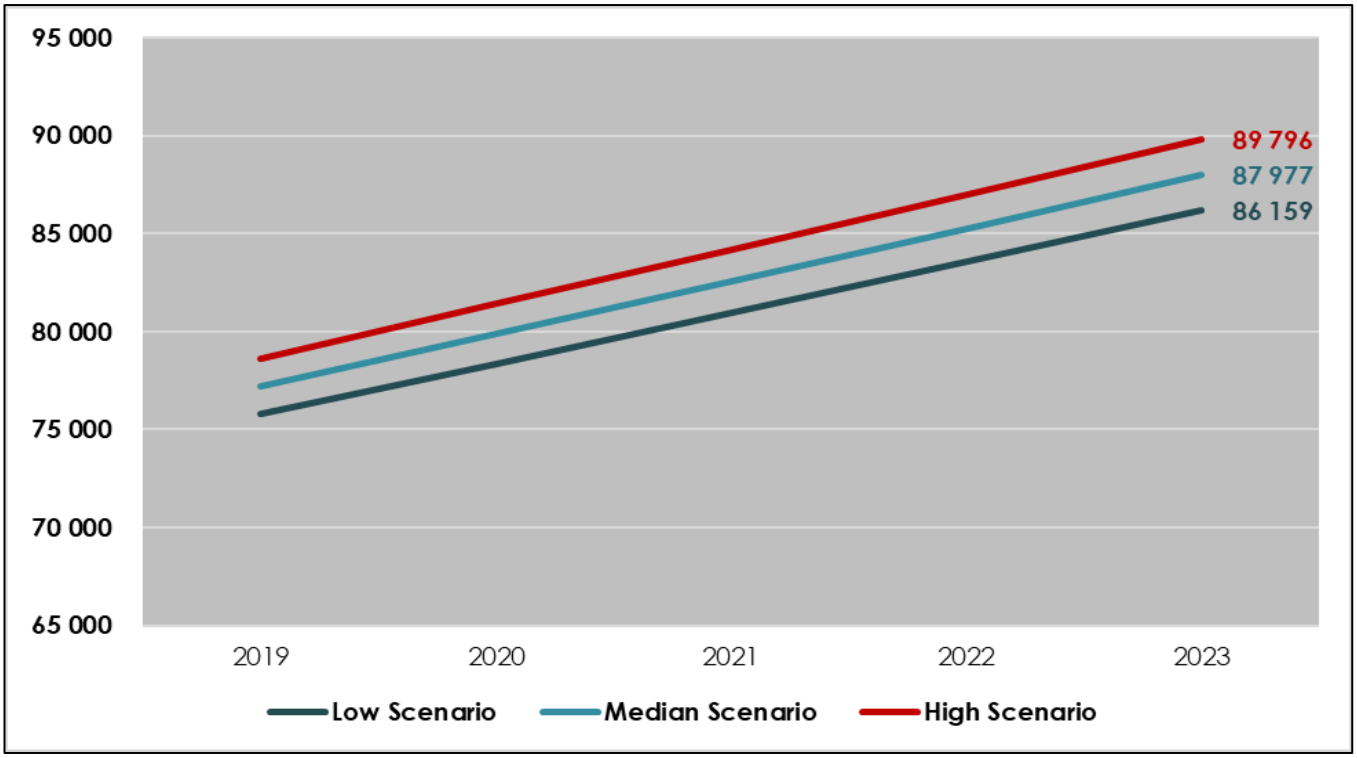

Figure 7-8: Projected total labour demand for the Road Freight Chamber (2019-2023)

Source: UE 2018

PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Road Freight Chamber. Table 7-12 reveals that 30 occupations were prioritised for this Chamber, which make up approximately 62% of the Chamber share. The **truck driver** occupation makes up **41% of the total Chamber share**. The remaining prioritised occupations each hold a much smaller share which may indicate that the priority occupation focus may need some slight adjustment.

The total top prioritised jobs identified for the Road Freight Chamber adds up to 54 596 anticipated jobs, based on the median scenario forecasted figures.

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Table 7-12: Road Freight Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Truck Driver (General)	41%	36 468	5 595
General Clerk	4%	3 792	582
Freight Handler (Rail or Road)	3%	2 504	384
Forklift Driver	2%	1 815	278
Dispatching and Receiving Clerk / Officer	2%	1 510	232
Loader Operator	1%	1 086	167
Transport Clerk	1%	1 061	163
Office Supervisor	1%	898	138
Call or Contact Centre Agent	1%	813	125
Road Transport Manager	1%	599	92
Diesel Mechanic	1%	581	89
Courier	1%	522	80
Logistics Manager	0,5%	401	61
Warehouse Manager	0,4%	354	54
Stock Clerk / Officer	0,4%	335	51
Fleet Manager	0,3%	283	43
Supply and Distribution Manager	0,3%	276	42
Crane or Hoist Operator	0,3%	270	41
Driving Instructor	0,3%	248	38
Credit or Loans Officer	0,2%	191	29
Training and Development Professional	0,1%	126	19
Occupational Instructor / Trainer	0,1%	110	17
Customer Service Manager	0,1%	104	16
Transport Analyst	0,1%	100	15
Purchasing Officer	0,1%	53	8
Operations Manager (Non-Manufacturing)	0,1%	48	7
Electric Substation Operations Manager	0,02%	17	3
Call or Contact Centre Manager	0,02%	14	2
Customs Officer	0,01%	12	2
Tow Truck Driver	0,01%	6	1
Total	**62%**	**54 596**	**8 376**

Source: UE 2018

Figure 7-9 below illustrates the net additional jobs anticipated for each of the top 15 prioritised occupations. The figure reveals the dominance of the truck driver occupation as compared to the other prioritised occupations.

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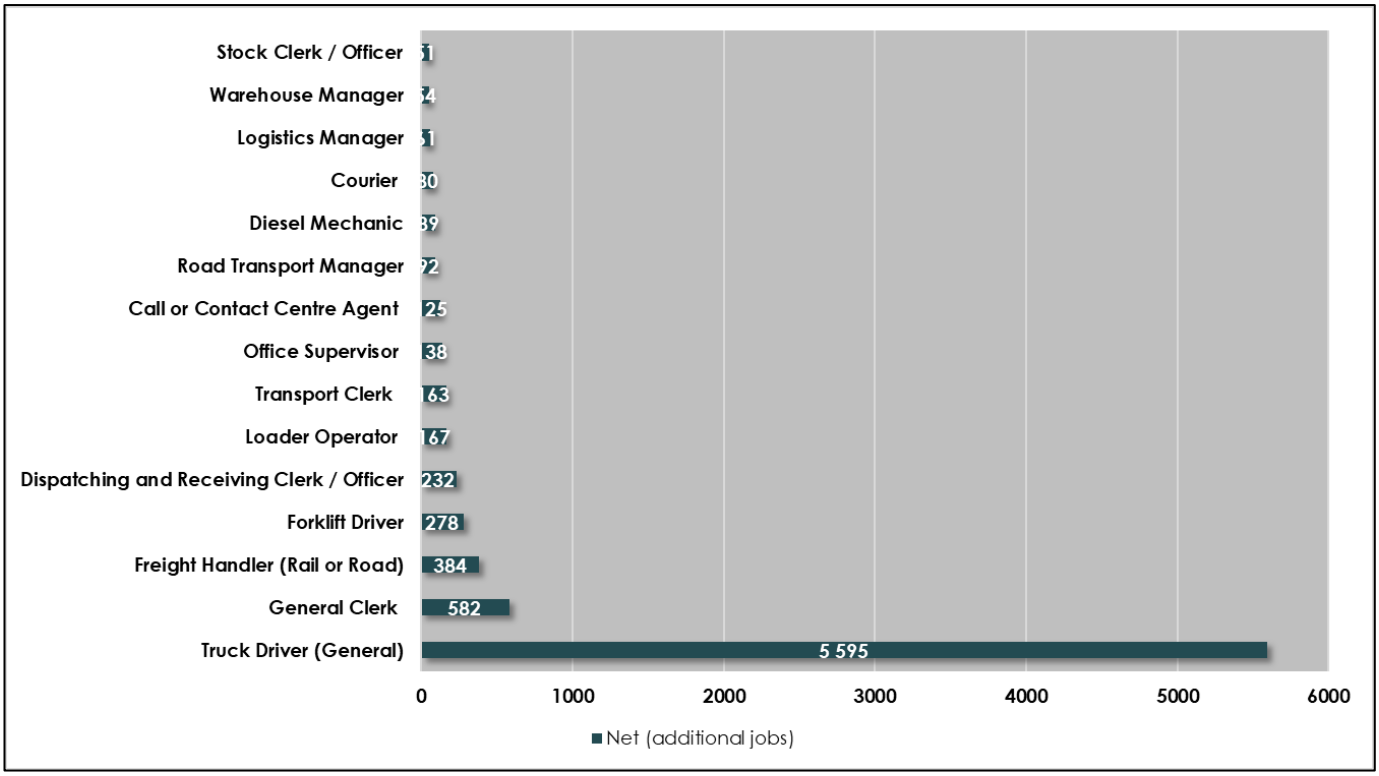

Figure 7-9: Net additional prioritised jobs for the Road Freight Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Road Freight Chamber are contained in the table below:

Table 7-13: Road Freight: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Tanker Driver	6%	5 274	809
Delivery Driver	5%	4 196	644
Adult Education Teacher	2%	1 639	252
Production Coordinator	1%	778	119
Store Person	1%	748	115
Handyperson	1%	748	115
Commercial Cleaner	1%	713	109
Accounts Clerk	1%	685	105
Sales Representative (Business Services)	1%	654	100
Warehouse Administrator / Clerk	1%	631	97
Total	**18%**	**16 067**	**2 465**

Source: UE 2018

When comparing the top 10 non-prioritised occupations to the prioritised occupations, it is clear that some focus adjustment is required. The anticipated additional occupations for the top 10 non-prioritised occupations should be allocated prioritised occupations, based on the number of additional anticipated jobs.

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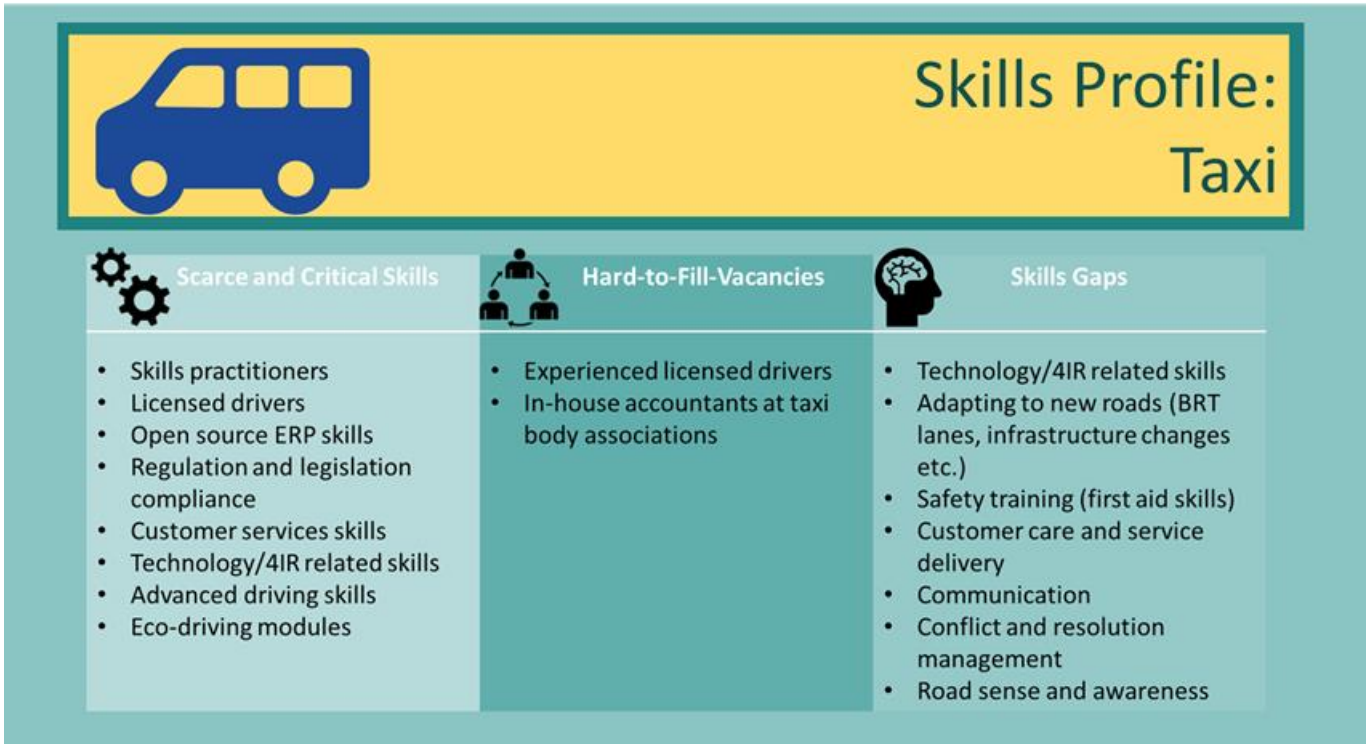
7.2.3 TAXI

According to the stakeholder engagements, there are at least 1 million people employed in this sector in various occupations, ranging from queue marshals to mechanics and spray painters. The industry is dominated by minibus drivers, with a small percentage having completed their matric or grade 12. The Taxi operators/owners are not necessarily 'tertiary qualified'. In some instances, retired workers from other industries or people who have lost their jobs will become Taxi owners. However, their prior qualifications are not necessarily industry related. Moreover, there is a higher entry barrier to becoming a Taxi operator than it is to become a Taxi driver. The latter simply requires a valid driver's licence and a permit to transport people.

7.2.3.1 SKILLS PROFILE

Box 6: Taxi Skills Profile



Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Taxi sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

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The skills profile of the Taxi industry is straightforward. There will always be a need for licensed drivers as the number of passenger minibuses increaseS on the roads or workers leave the industry. Another vacancy that the industry perceives as hard to fill is in-house accountants. It is expensive to hire or outsource bookkeepers on a regular basis. It would greatly help Taxi associations if they were able to have in-house people to do their bookkeeping. The industry deals with monetary inventory every day and throughout the day.

The scarce and critical skills identified for the industry is born out of the need for the industry to adapt to the new passenger services and technology-driven operations and processes. The stakeholders interviewed also identified the importance of having people on-board the industry who not only understand regulations and the legislation around the Road Transport industry, but can enforce these rules.

The skills gaps identified for the Taxi industry include having knowledge of how technology is influencing transportation and its service providing. Safety training and compliance to the rules of the road, having awareness of other uses and even passengers are also highlighted as important to the demands of the industry. From interviews with industry stakeholders, it was revealed that many users of Taxi services are growing uncomfortable with the outright negligence with which drivers use the road and treat fellow road users and those making use of their services. Stakeholders further identified the need for Taxi drivers and operators to understand the value of customer service and delivery, which follows from effective communication. The other skills gap highlighted is the need for conflict and resolution management among players in the Taxi industry.

7.2.3.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Taxi sub-sector.

The current focus areas around skills development for this sub-sector revolve around training drivers in defensive driving, customer care awareness, supervisory of drivers, and safety and health concerns. Most of the skills and development issues in the Taxi industry concerns drivers since they are the primary labourers in the sector. All the other occupations are either secondary or merely supportive.

Skills needs

South Africa's Taxi industry is unique and therefore inward-looking when it comes to trends and developments. Most of the influences that impact the sector are socio-political. With Taxi operators/owners feeling entitled to specific routes in a wider district, how they use the roads and who also who they compete with in the passenger transport market. Therefore, the skills needs are directed towards understanding of the law, regulations and compliance. Governing bodies are looking to instil law and formalisation into the Taxi industry to curb the intolerance towards competitors or foreign labour present in the market.

There is also a drive toward educating labourers in the industry of technological advancements and e-hailing services. There is a fear of scarcity in the industry and this has to be addressed. Other skills trends being fulfilled include driver training projects. There is a currently a 1-year National Certificate course in Professional Driving to ensure competent and professional driving on SA's roads. This certificate increases the earning potential of Road Transport drivers, as well as promoting professionalism. TETA also offers leadership-related training and development projects for Road Passenger workers in the industry.

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The occupations currently receiving the biggest training spend are drivers, queue marshals, office and administrative workers. Many workers in the industry are reluctant to participate in training and development programmes since they work on a 'no-work-no-pay' basis, and understandably, many drivers depend on surplus profits as their income.

Challenges

There were not many skills-related challenges identified in the stakeholder engagements for this sector. Key amongst those addressed, however, were that:

- The Taxi industry is often considered a last-resort employer. Therefore, once workers are able to find what they perceive as better employment, they leave. Where training is concerned too, many participate in training programmes with the objective that it will empower them to find other employment. The Taxi sector has very little retention power. Many will not be around to evolve with the industry.
- Other occupations active in the taxi industry, such as queue marshals, earn very low salaries. As a result, there is very little retention of workers within the wider Taxi industry.
- TETA's structure of consultation is lengthy and cumbersome. The authority ought to institute an ongoing consultation process with sub-sectors as well as develop a decision-making body with a quick response time.

7.2.3.3 FUTURE DEMAND

Table 7-14 below provides an overview of the skills demand forecasting results for the Taxi Chamber. The Taxi Chamber holds more than half of the overall anticipated occupations within the TETA landscape (52%). The table further provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023. The total anticipated jobs range between 426 142 and 444 134 (low and high scenario) with 435 138 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 64 097 to 69 415, with 66 756 being the median and most likely scenario.

Table 7-14: Projected Net and Total labour demand for the Taxi Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Taxi	**52%**	46%	426 142	435 138	444 134	64 097	66 756	69 415

Source: UE 2018

Table 7-14 also provides the prioritised occupation share for the Taxi Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Taxi Chamber are illustrated in Figure 7-10. The anticipated additional occupations are revealed per year, for a low, median and high scenario. The number of new jobs expected for 2019 range between 12 742 and 13 960. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023

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thus range between 12 882 and 13 820. The total number of additional jobs expected over this period (2019-2023) are estimated to be 66 756, based on the median scenario.

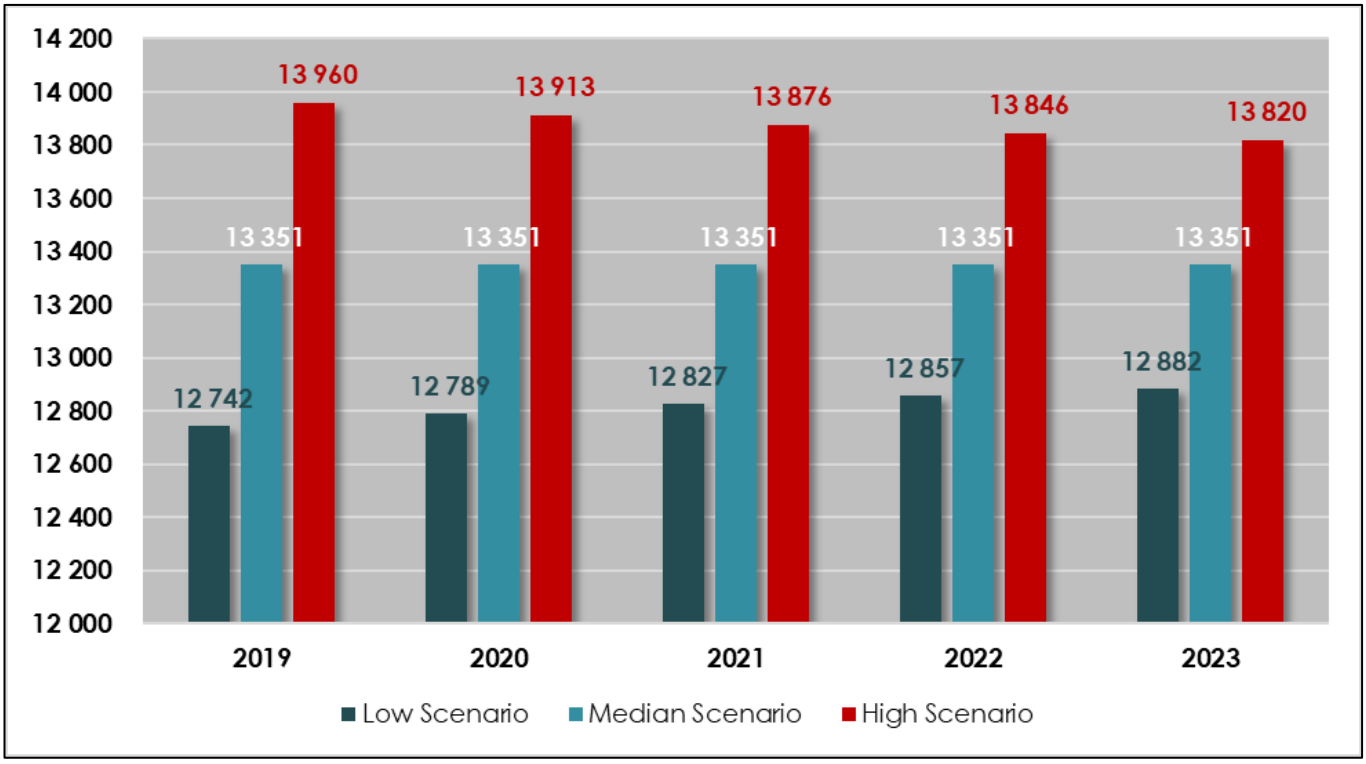

Figure 7-10: Projected Net (additional) jobs for the Taxi Chamber (2019-2023)

Source: UE 2018

Figure 7-11 below illustrate the total anticipated labour demand for the Taxi Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 374 787 and 388 679 jobs in 2019 to between 426 142 and 444 134 jobs in 2023.

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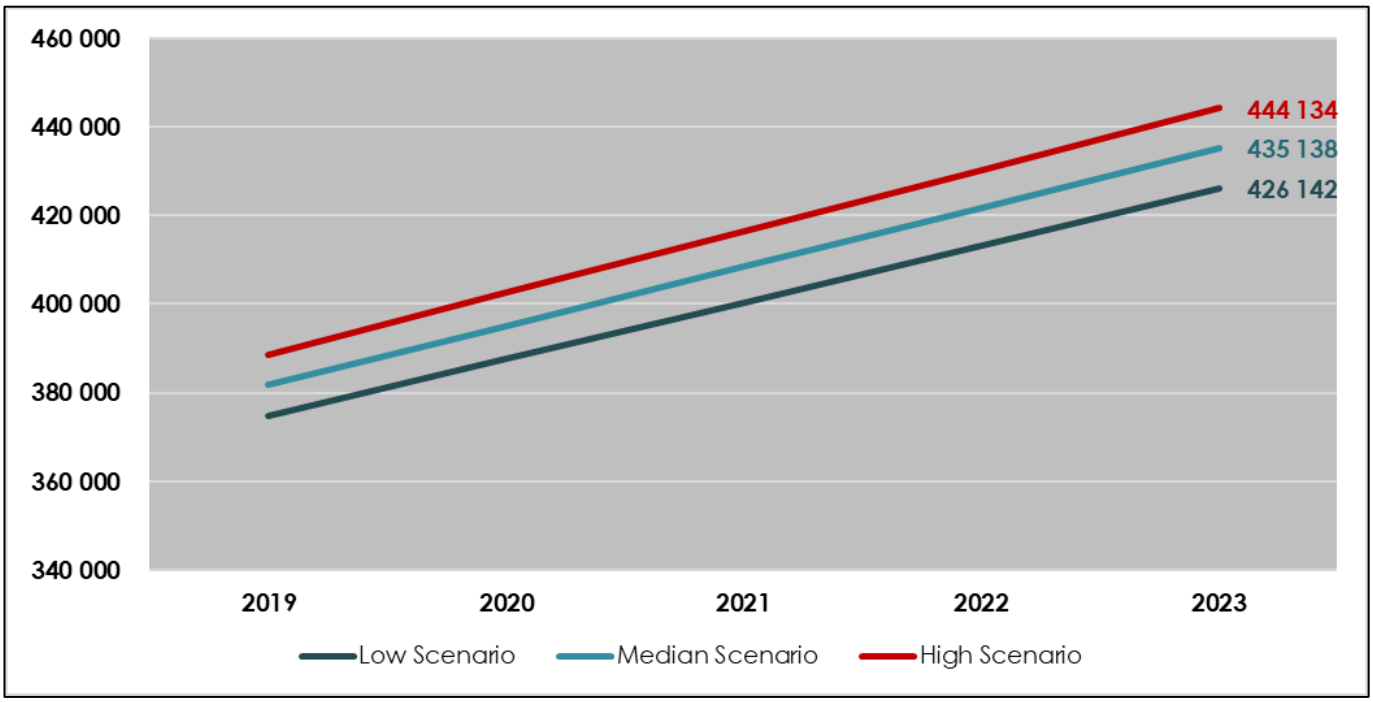

Figure 7-11: Projected total labour demand for the Taxi Chamber (2019-2023)

Source: UE 2018

PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Taxi Chamber.

reveals that only 6 occupations were prioritised for this Chamber, which make up approximately **52% of the Chamber share**. The **chauffeur** and **Taxi driver** occupations are the only prioritised occupations anticipated to have additional jobs over this period. The two occupations make up 26% of the Chamber share respectively, indicating that these occupations are in fact in demand. The fact that the other prioritised occupations are not anticipated to provide additional jobs may mean that the priority occupations may need some slight adjustments.

It should also be noted that the Taxi Chamber is dominated by mini-bus Taxis, with the majority of these 'businesses' not being formally registered with SARS or submitting WSP/ATR to TETA. This may mean that these listed priority occupations may be a priority to the mini-bus Taxi industry, but training in those occupations are not being reflected as it is not reported on formally.

Table 7-15: Taxi Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Automotive Motor Mechanic	0%	-	-
Bookkeeper	0%	-	-
Chauffeur	26%	114 521	17 569
Panel beater	0%	-	-
Taxi Driver	26%	113 323	17 385
Tour Guide	0%	-	-
Total	**52%**	**227 844**	**34 955**

Source: UE 2018

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Figure 7-12 below illustrates the net additional jobs anticipated for each of the prioritised occupations. The figure reveals that the chauffeur and Taxi driver occupations are closely related in terms of the number of anticipated jobs, and that it is the only two prioritised occupations where additional jobs are anticipated.

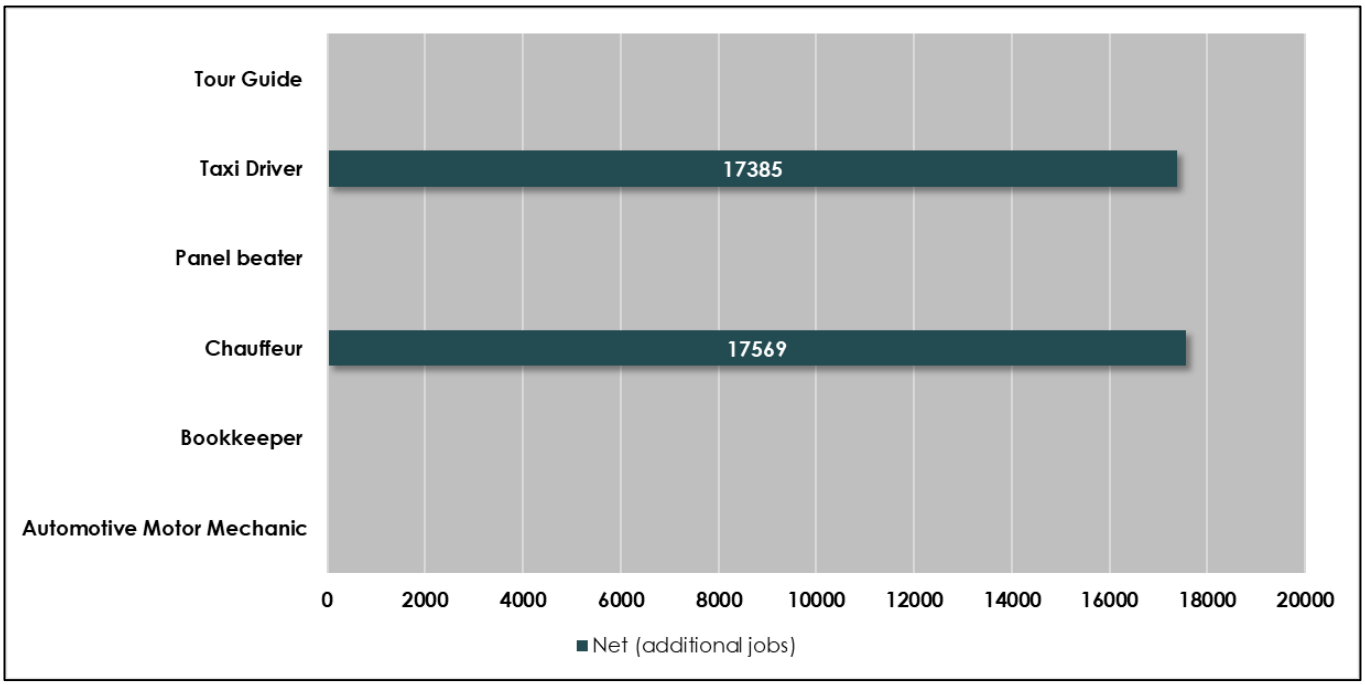

Figure 7-12: Net additional prioritised jobs for the Taxi Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Taxi Chamber are contained in the table below:

Table 7-16: Taxi: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Call Centre Salesperson	7%	29 927	4 591
Occupational Instructor / Trainer	6%	23 942	3 673
Adult Education Teacher	4%	17 956	2 755
Service Station Attendant	4%	17 956	2 755
Dispatching and Receiving Clerk / Officer	4%	16 360	2 510
Vehicle Detailer (Valet Servicer)	3%	12 769	1 959
Truck Driver (General)	3%	12 569	1 928
Travel Consultant	2%	8 380	1 286
Corporate Services Manager	1%	6 384	979
Office Cashier	1%	6 384	979
Total	**35%**	**152 628**	**23 415**

Source: UE 2018

When comparing the top 10 non-prioritised occupations to the prioritised occupations, it is clear that some focus adjustment is required. The anticipated additional occupations for the top 10 non-prioritised occupations should be allocated prioritised occupations, based on the number of additional anticipated jobs.

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7.2.4 RAIL

According to the stakeholder engagements, there are at least 100 000 workers in the Rail sub-sector, with majority employed by Transnet alone. The sector's labour profile is dualistic, with high-level skills found in engineering, technical and safety related occupations, and low to semi-skilled labourers at operational level. This section will provide further insight into the sector's current labour and skills profiles, and the skills development trends and challenges it faces.

7.2.4.1 SKILLS PROFILE

Box 7: Rail Skills Profile

Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Rail sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

There is a crossover between the scarce and critical skills identified with those of the skills gaps. Both columns highlight the need for leadership and ICT skills. While the skills gaps identified further highlight the

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need for soft skills and industry knowledge, the scarce and critical skills in demand are those that are more technically inclined, such as skills needed for Rail operations or civil maintenance.

Furthermore, the Rail sub-sector could learn from other highly regulated and safety control industries, like the aviation industry, for example. Safety issues such as maximum work hours, undergoing medical tests, and resting periods are important aspects that technology can help to control and minimise the risks thereof. Opinions of stakeholders consulted revealed that the Rail sector, as a collective, is poor at implementing new practices and continually monitoring and managing measures that are critical to its operations. These and related issues speak to the industry's need for specialists to act on industrial impulses. The old idea of a manager without technical knowledge and experience cannot be sustained in this ever-changing business environment. Occupations should be adjusted accordingly.

This is reflected in the vacancies that are identified as hard to fill. Highly-technical occupations are in demand for this sector, not managerial ones. It was stressed during the stakeholder engagements that the industry does not need more people to oversee operations, but rather those than can be functional. The ailing Railway infrastructure also calls for increased civil engineering and maintenance. It is a major risk for the Rail sector to not address the state of its infrastructure, equipment and aging workforce.

Against the needs of the industry, for comparative insight, the current and dominant skills and occupations in the Rail sector includes train drivers, yards people, engineers (but not enough), train controllers/operators, security and people working in maintenance. There is a need for a skills audit to be done across the sector. There appears to be many areas of skills mismatches, or where people at the executive level have little to no Rail-specific background. Rail-oriented training is a must at all skills levels in the industry since the environment is sensitive to ignorance or malpractice.

7.2.4.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Rail sub-sector.

It appears that impact of skills development on the Rail transport sector skills over the past 5 years have not been substantial. Respondents maintain that the skills supplied into the market are outdated and only focuses on the current profile of jobs, while future jobs are not being planned for or developed. A Needs analysis is necessary for occupations and skills to be developed according to future priority skills. The skills determined as future priority should then feed into the qualifications developed through the Quality Council for Trades & Occupations (QCTO). It is difficult to track learners who were given skills training once they leave the programme and enter the labour market. Whether the training was effective and successful is difficult to determine for this reason.

However, the sector's ability to use discretionary grants that feed into national requirements have been helpful. There is also a concentrated effort towards health and safety training with a high ethical grade. The current B-BBEE requirements to increase absorptions rates have been positively dealt with by Transnet, but it is not practical to take in all the people that are trained. Transnet trains hundreds of people and they do not have the capacity to retain all of them.

At present, key focus areas for skills development programmes lie in operations. Particularly at Transnet Freight Rail, where the core business is around operations and handling of equipment. Leadership is another area receiving attention, as those in upper level positions should have agility, the ability to apply quick interpretation, strategic thinking, and they should be well-informed and informative to those they are

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leading. Change management is a new area also being developed as an organisational tool. People with disabilities (PwD) and women form part of the focus scheme in these programmes. Transnet, for example, uses a competency framework to determine the levels of skills required for workers and this is then adapted and modified accordingly. A one-way approach does not work anymore.

Skills trends

The skills and occupations that will become relevant to the Rail sector driven by key trends and change drivers are those that will require multi-disciplinary skills. Jobs specific to IT skills include developers, programmers and designers that are talented for Rail-specific needs. Other occupations that will be relevant are Railway engineers and Railway operations people that will be able to manage operations combined with the new technological interface. Moreover, the right training for the right people along the right path will be crucial to the industry; a clear career path is critical. Therefore, skills such as talent management in the Rail sector will become a prevalent need. Skills and talent development will address the needs of both the client and the industry, and the standards set to attain such individual should be of high quality. Recognition of Prior Learning (RPL) should be considered and more affordable training should be prioritised for the sector.

Other general changes in skills needs for the future of the Rail sector will be related to elements of improved soft skills that enable employees to be flexible, adaptive and accommodating of emerging trends and changes in the environment. These skills also include the ability to adapt to volatile markets and to employ strategic thinking in everyday activities. Basic IT skills will be essential for all employees across the board, since the movement of Rail will become integrated and operations centralised. Following this, the ability to manage and analyse big data will be a required skill too.

Considering the imminent shift in skills discussed, it is important to note that the Rail sector is a highly safety regulated environment, which means that the rapid change of occupations and skills are not likely. Yes, they will occur, but at a much slower and controlled pace than the other transport sectors, perhaps.

Challenges

The skills development challenges currently facing the industry include:

- Budgetary constraints impact the roll-out of initial training and thus recruitment
- No change systems in place for use and adaptation of technology
- Lack of financial investment into the industry
- Lack of resources makes it difficult to expand sector's skills profile, to upskill people, and to bring in people who have the required skills
- Natural attrition
- Low participation rates in skills development initiatives in the industry
- Assessment specifications that meet the requirements of industry and specific employers
- Limitations on the service offering of the Transport SETA:
    - Lack of partnership development between public and private sector role players
    - Lack of appropriate and timeous response from TETA to the Rail industry/stakeholders
    - A need for better communication and cooperation between TETA and the industry around the skills and qualifications that are in demand now and in the future. Regular forums for engagements between the training authority and industry players are essential.
    - A strategy plan from TETA to demonstrate how they are going to support the shifts towards technology and digitisation in the Transport industry
    - New ways of learning and teaching need to be adapted, e.g. virtual reality rooms
    - Compliance is priority, not real results

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- The way the WSP/ATR is captured. A better model is needed; it takes up to 7 months to complete the WSP. The WSP is a dead document once completed because it cannot be edited once submitted even though changes may come up during the time until the ATR is drafted. There should be a way to update the WSP on an ongoing basis.
- Forms should be open to be updated throughout the year – an ongoing monitoring and tracking system

7.2.4.3 FUTURE DEMAND

An overview of the skills demand forecasting model results for the Rail Chamber is contained in the table below. The results show that the Rail Chamber holds 35% share of the overall anticipated occupations within the TETA landscape. The table also provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023. The total anticipated jobs range between 106 056 and 110 533 (low and high scenario) with 108 295 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 15 952 to 17 276, with 16 614 being the median and most likely scenario.

Table 7-17: Projected Net and Total labour demand for the Rail Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Rail	**35%**	11%	106 056	108 295	110 533	15 952	16 614	17 276

Source: UE 2018

Table 7-17 also provides the prioritised occupation share for the Rail Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Rail Chamber are illustrated in Figure 7-13. The anticipated additional occupations are revealed per year for a low, median and high scenario. The number of new jobs expected for 2019 for range between 3 171 and 3 474. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 3 206 and 3 440.

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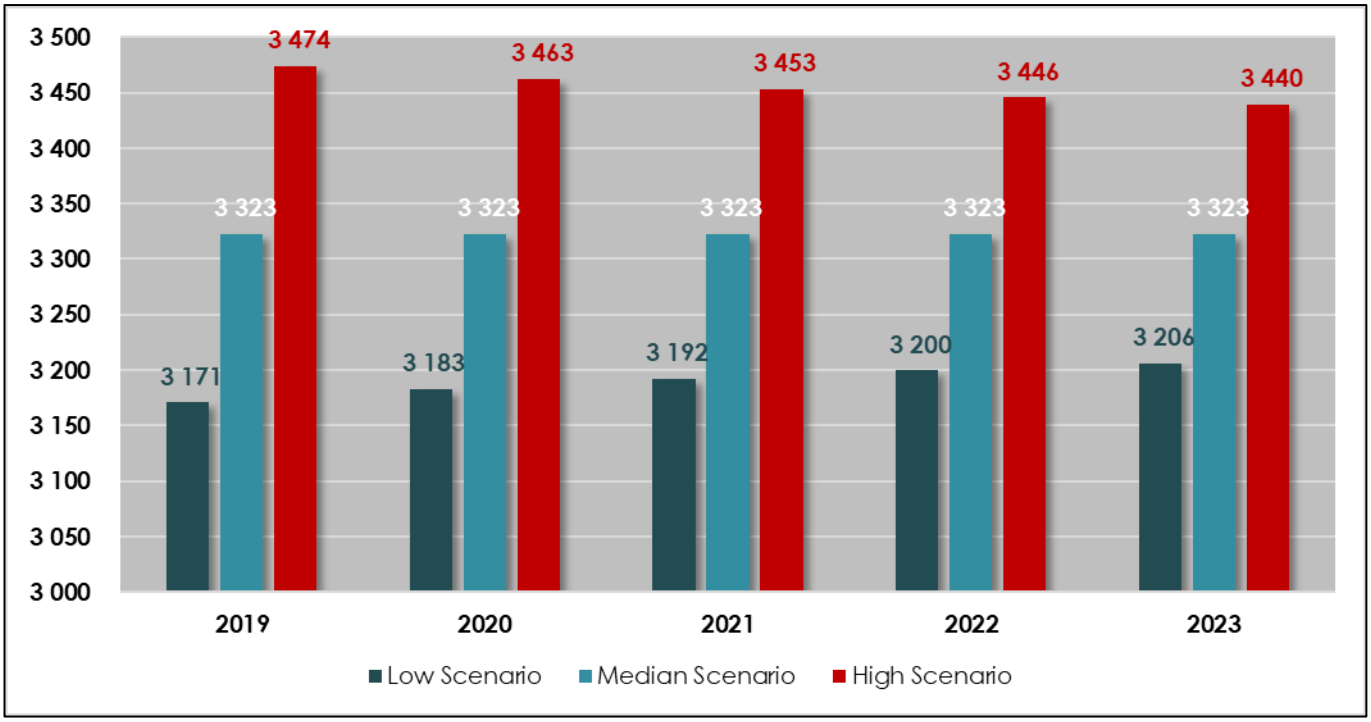

Figure 7-13: Projected Net (additional) jobs for the Rail Chamber (2019-2023)

Source: UE 2018

The figure below illustrates the total anticipated labour demand for the Rail Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 93 275 and 96 732 jobs in 2019 to between 106 056 and 110 533 jobs in 2023.

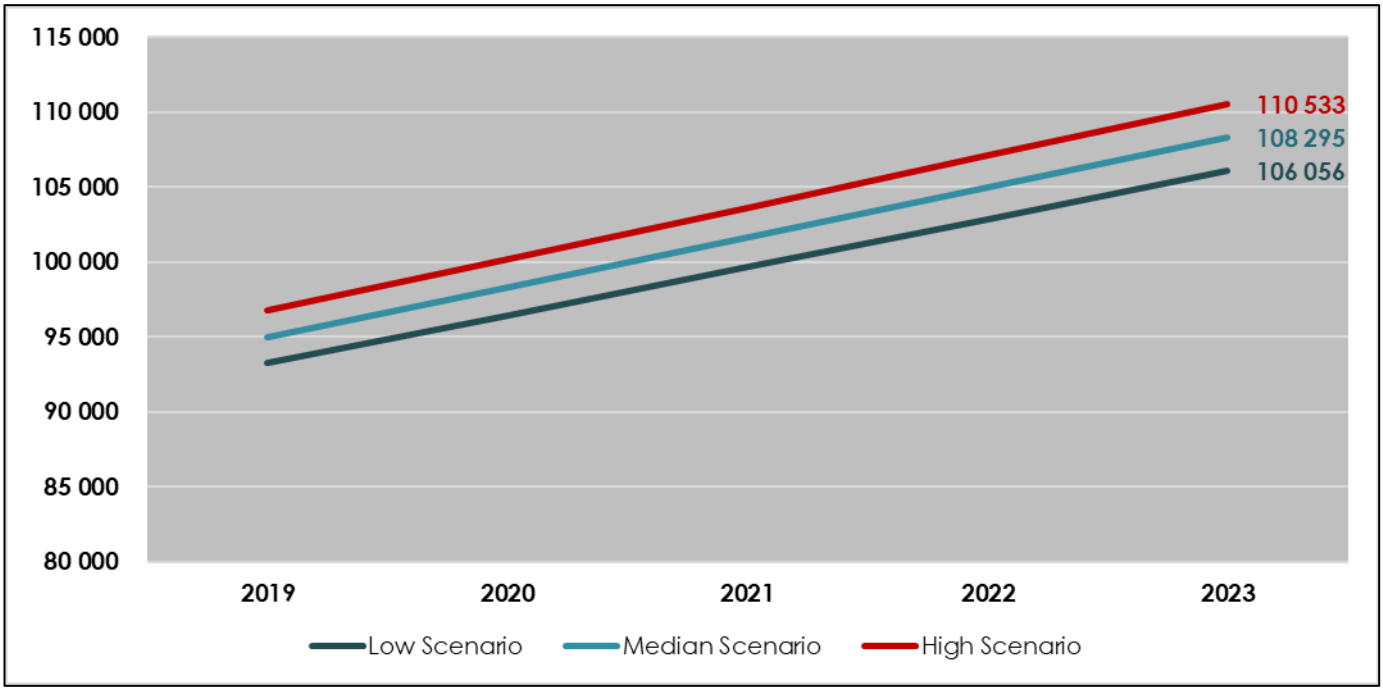

Figure 7-14: Projected total labour demand for the Rail Chamber (2019-2023)

Source: UE 2018

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PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Rail Chamber.

Table 7-18 reveals that 13 occupations were prioritised for this Chamber, which make up approximately **35% of the Chamber share**. The **train driver** occupation makes up **12%** and the **Railway signal operator** occupation makes up **10% of the total Chamber share.** The remaining prioritised occupations each hold a small share which may indicate that the priority occupation focus may need to be adjusted.

The total top prioritised jobs identified for the Rail Chamber adds up to 5 854 anticipated jobs, based on the median scenario forecasted figures.

Table 7-18: Rail Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Train Driver	12%	13 420	2 059
Railway Signal Operator	10%	11 369	1 744
Electrician	3%	3 261	500
Mechanical Fitter	2%	2 374	364
Train Controller	2%	2 252	346
Welder	2%	1 809	278
Electrical Engineering Technician	1%	1 449	222
Civil Engineering Technician	1%	688	106
Diesel Fitter	0,5%	508	78
Railway Steward	0,5%	491	75
Electrical Engineer	0,4%	480	74
Metal Machinist	0,1%	55	8
Diesel Mechanic	0%	0	0
Total	**35%**	**38 156**	**5 854**

Source: UE 2018

The figure below illustrates the net additional jobs anticipated for each of the prioritised occupations. The figure reveals the dominance of the train driver and Railway signal operator occupation as compared to the other prioritised occupations.

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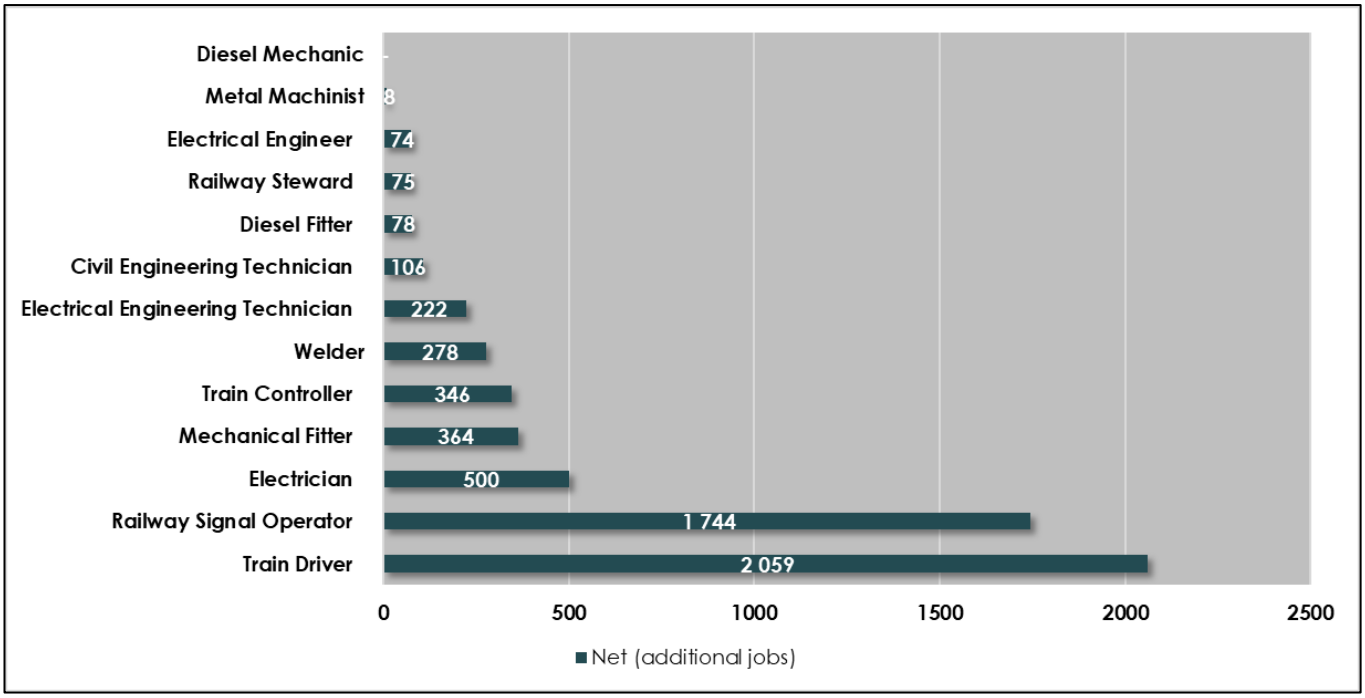

Figure 7-15: Net additional prioritised jobs for the Rail Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Rail Chamber are contained in the table below:

Table 7-19: Rail: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Engineering Production Systems Worker	23%	24 566	3 769
Railway Track Worker	6%	6 070	931
Operations Manager (Non-Manufacturing)	2%	2 250	345
Chauffeur	2%	2 185	335
Security Officer	2%	1 971	302
Railway Track Master	2%	1 935	297
Earthmoving Worker	1%	1 484	228
Office Administrator	1%	1 302	200
General Clerk	1%	1 240	190
Production / Operations Supervisor (Manufacturing)	1%	1 186	182
Total	**41%**	**44 188**	**6 779**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that the for the **engineering production system worker** occupation more additional jobs are anticipated than the top two prioritised occupations. The fact that the top 10 non-prioritised occupations make up almost 40% of the occupation share as opposed to 35% of prioritised occupations indicates that the priority focus for the Chamber is too narrow.

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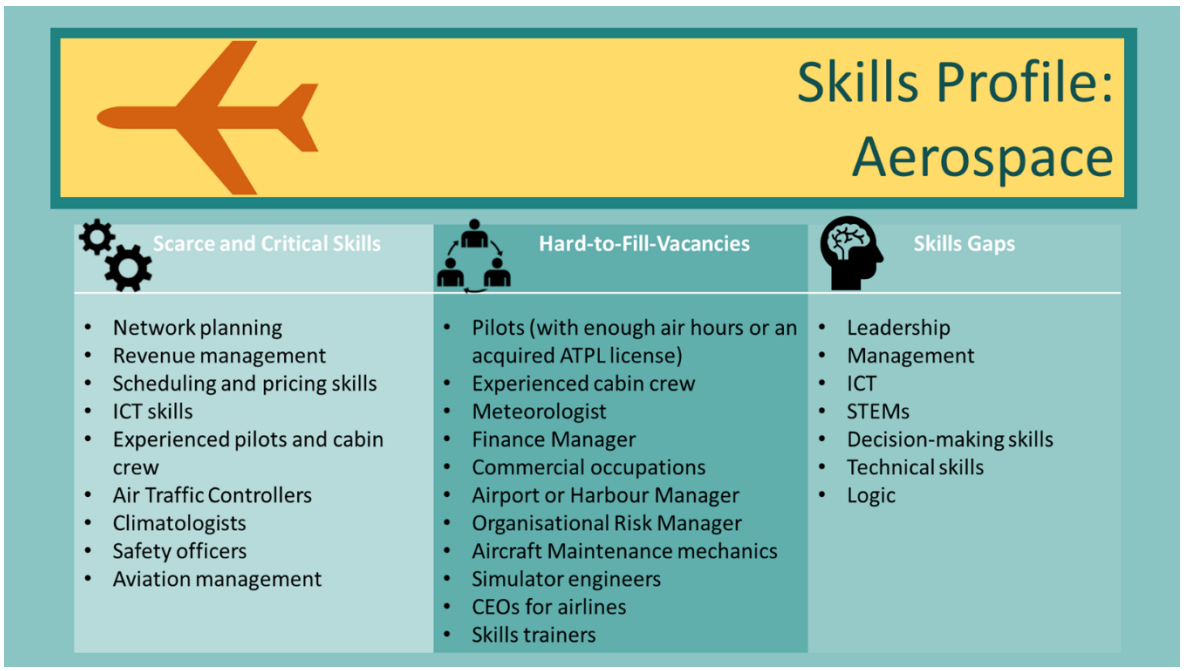
7.2.5 AEROSPACE

According to the stakeholder engagements, the Aerospace sub-sector comprises a small number of employers. The big companies are easy to identify since the market is not very competitive; only a few monopolise the industry. Out of the 72 companies that apply for the workplace skills plan (WSP), 10 of them are big name companies. The sector's labour profile is marked by all levels of skills, from low- to high-skilled and even specialist labour. The following section provides more insight into the sector's profile of labour, and skills development.

7.2.5.1 SKILLS PROFILE

Box 8: Aerospace Skills Profile



Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Aerospace sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

The skills profile for the Aerospace sub-sector appears very diverse in terms of the identified scarce skills needs, gaps, and even the occupations that are in demand but hard to fill. The scarce and critical skills consist of competencies ranging from experienced pilots to safety offices, to management necessary for

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aviation control, network planning and air traffic control. The HTFVs identified for the sector consists of experienced management skills, at times up to the executive level, with regard to commercial and business-related activities. The vacancies identified are supported by the skills gaps identified such as leadership, management skills, and decision-making. The aviation industry is defined by the knowledge of and technical ability in the field of STEM (science, technology, engineering and mathematics) subjects. It is surprising that this is part of the skills that the industry finds lacking; it should be in oversupply.

The shortage of 'obvious' skills in the sector could be attributed to the fact that trainees are provided with the bare minimum of requirements in the field. For example, there is a surplus of CPL certified pilots in the in the market, while the sector needs pilots with an ATPL certification or the equivalent of at least 1 500 hours of flight experience. This mismatch of what is provided in terms of skills and training and what is required is exacerbated by training authorities only providing funding for minimum requirements and a small pocket of professions they perceive relevant.

Another element is linked to the perception that the industry is 'elite' or 'glamourous' and only constituting aircraft pilots and the cabin crew. However, the industry is a complex hybrid of high-level technical and operational ability, including aircraft design, manufacturing and engineering. There is a lack of skills and occupations facing all these capabilities. Moreover, the industry cannot sustain itself in the long run without air traffic controllers, meteorologists, network planners, maintenance mechanics, harbour managers, and even metal workers. The pilots who have already obtained commercial licenses should be matured to higher levels of experience and competence. A shift in focus and priorities in the development of the sector's skills profile going forward is necessary.

Awareness needs to be created to demystify the sector and to attract highly capable people to fulfil the technical and practical demands of the sector. Introduce the entry requirements of the aviation network to school-going children before subject choices are made. The departments of education in conjunction with training authorities should work towards addressing skills shortages at the levels where they matter. Many aspirant learners learn too late that they do not meet the required criteria when they wish to enter the industry. The aviation industry adheres to stringent safety and international standards and cannot lower entry requirements, despite the pressure to do so.

Against the future needs of the industry, for comparative insight, the current and dominant skills and occupations in the Aerospace sector include commercial pilots, cabin crew, ground operators, security and safety officers, airport administrative staff (ticketing and boarding staff), and commercial occupations (route developers, schedulers). These occupations will be most impacted by a more digitised environment that would reduce the need for check-in counters and staff; however, for security purposes their need will not become completely redundant but will have to be up-skilled. As much as AI, robotics and analytics will feature more prominently, full automation or pilotless aircraft is not likely to be practical or socially acceptable in the foreseeable future.

7.2.5.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Aerospace sub-sector.

The impact of skills development in the sector in the past five years in the sector is met with ambivalence. The respondents feel that the current skills development approach generates highly skilled unemployed people. A lot is invested into training pilots, but very little is done to ensure they receive adequate experience that will increase their chances at employment. This approach is misguided and short-sighted

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on the part of training authorities, as this negatively impacts the youth more than anything else. More positively, investments into leadership skills are making a positive difference since management skills are of growing importance. Higher-level skills are being developed too, as the industry and the business environment is moving away from basic competencies and abilities to those that are more dynamic, nuanced and constructive.

Skills trends

The skills focus of the industry will shift along those dictated by international trends and technological advancement. The design and manufacturing of aircraft will change, and the engineers, technicians, mechanics and designers involved with this process will have to be equipped with knowledge and technical ability to apply innovative industrial practices to the traditional framework.

New skills will also be accommodative of the 4IR, where pilots, cabin crew and operators are required to work alongside technologically motivated processes. Coding or programming will become a skill to harness as big data and analytics become the norm. Better customer service is becoming more aspirational, and workers are implored to be more socially, culturally and politically sensitive. Human resource services will also move along this trajectory to make more dynamic personnel appointments. Other general changes in skills needs for the future of the Aerospace space will be related to elements of improved soft skills that enable employees to be flexible, adaptive and accommodating of emerging trends and changes in the environment.

Challenges

The skills development challenges currently facing the industry include:

- The costs involved in training pilots who end up unemployable
- There is no training for maintenance workers and technicians
- There are no programmes available at universities or academies for commercial occupations (route developers, schedulers, pricing and revenue management, etc.)
    - There is a demand for the occupations to have formal training
    - Comair currently appoints people from abroad to fill these roles on a 2-year contract
- Ageing personnel will retire without skills transfers between them and the next generation
- The industry could use a pilot training and aviation academy, like the US's Federal Aviation Administration (FAA). TETA could facilitate such an academy:
    - This would ensure that all the skills and qualifications are housed at one place
    - Courses would be locally accredited
    - A pool of candidates can be moulded for recruitment
- Limitations on the service offering of the Transport SETA:
    - Funding is apportioned according to the sub-sector size – Aerospace sector lacks funding
    - Despite being guided by the NSDP, TETA appears to be getting info that is not accurate or speaks to specific Chambers only. Information collected is biased to specific company's needs which is not a true reflection of the needs of the whole industry/sector.
    - The disconnect between TETA and the South African Civil Aviation Authority (SACAA) which interferes with the skills developed and those that are in actual demand
    - More engagements should happen between role players in the industry; the WSP/ATR alone is not representative of what is happening in the industry. TETA need to be more active in the Transport industry to get first hand exposure to the industry and its needs.
    - TETA's blanket approach not effective
    - Skills development initiatives are not contextualised to make an actual difference
    - The WSP/ATR is too labour intensive – an administrative burden and costly to undertake

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- Decisions take appear to be politically driven. Some disregard the seriousness of the aviation industry; lowering entry requirements is an irresponsible notion when a pilot is responsible for up to 800 lives per trip.

- It was suggested that the existence of QCTOs alongside already established Aviation Training Organisations (ATOs) are unnecessary. It is a tedious and costly process to become a skills development provider and adhering to standards for approval and accreditation is not easy in the aviation industry.

7.2.5.3 FUTURE DEMAND

An overview of the skills demand forecasting model results for the Aerospace Chamber are contained in the Table 7-20 below. The results show that the Aerospace Chamber holds 67% share of the overall anticipated occupations within the TETA landscape. The table also provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023. The total anticipated jobs range between 49 838 and 51 942 (low and high scenario) with 50 890 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 7 496 to 8 118, with 7 807 being the median and most likely scenario.

Table 7-20: Projected Net and Total labour demand for the Aerospace Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Aerospace	**67%**	5%	49 838	50 890	51 942	7 496	7 807	8 118

Source: UE 2018

Table 7-21 also provides the prioritised occupation share for the Aerospace Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Aerospace Chamber are illustrated in Figure 7-16. The anticipated additional occupations are revealed per year for a low, median and high scenario. The number of new jobs expected for 2019 for range between 1 633 and 1 490. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 1 616 and 1 507. The total additional jobs anticipated from 2019 to 2023 is 7 807, based on the median scenario.

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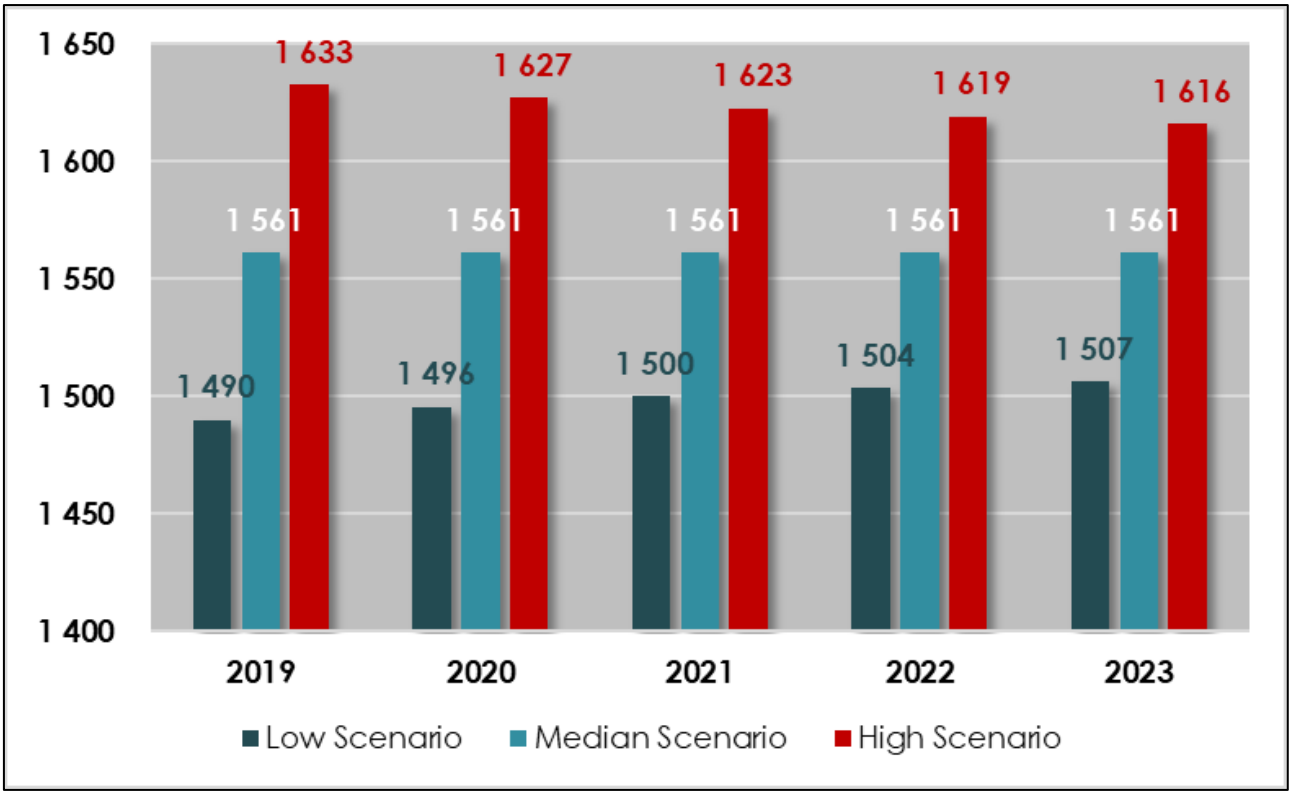

Figure 7-16: Projected Net (additional) jobs for the Aerospace Chamber (2019-2023)

Source: UE 2018

Figure 7-17 below illustrates the total anticipated labour demand for the Aerospace Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 43 832 and 45 456 jobs in 2019 to between 49 838 and 51 942 jobs in 2023.

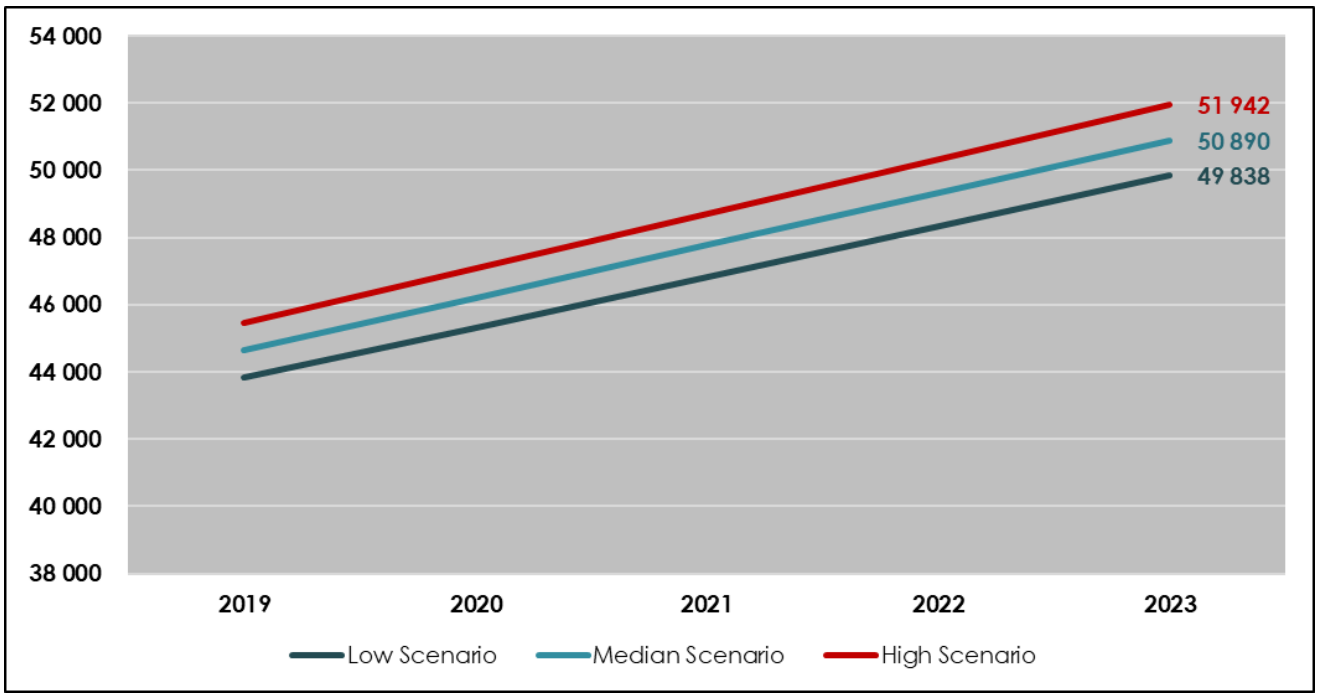

Figure 7-17: Projected total labour demand for the Aerospace Chamber (2019-2023)

Source: UE 2018

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PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Aerospace Chamber. A total of 26 occupations were prioritised for this Chamber, which make up approximately **67% of the Chamber share**. The **flight attendant** occupation makes up **24% of the total Chamber share**.

The total top prioritised jobs identified for the Aerospace Chamber adds up to 5 225 anticipated jobs, based on the median scenario forecasted figures.

Table 7-21: Aerospace Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Flight Attendant	24%	12 128	1 861
Airline Ground Crew	15%	7 683	1 179
Aeroplane Pilot	10%	4 954	760
Travel Consultant	8%	3 908	600
Aircraft Maintenance Mechanic	4%	1 946	299
Aircraft Structures Worker	2%	794	122
Avionics Mechanician	1%	433	66
Fire Fighter	1%	429	66
Flight Engineer	1%	290	44
Flying Instructor	1%	280	43
Metal Machinist	0,4%	209	32
Airport or Harbour Manager	0,4%	207	32
Aeronautical Engineer	0,4%	191	29
Contact Centre Real Time Advisor	0,3%	136	21
Vehicle Painter	0,3%	136	21
Air Traffic Controller	0,2%	99	15
Meteorologist	0,1%	76	12
Welder	0,1%	42	6
Helicopter Pilot	0,1%	30	5
Supply and Distribution Manager	0,1%	27	4
Security Services Manager	0,05%	25	4
Electroplater	0,03%	15	2
Fitter and Turner	0,01%	7	1
Electronic Equipment Mechanician	0,01%	6	1
Aircraft Navigator	0,01%	5	1
Attorney	0,001%	1	0
Total	**67%**	**34 057**	**5 225**

Source: UE 2018

The figure below illustrates the net additional jobs anticipated for the top 10 prioritised occupations. The figure reveals the proportional spread of prioritised occupations, revealing that the focus for the Chamber is aligned to those occupations anticipated to have the most additional jobs.

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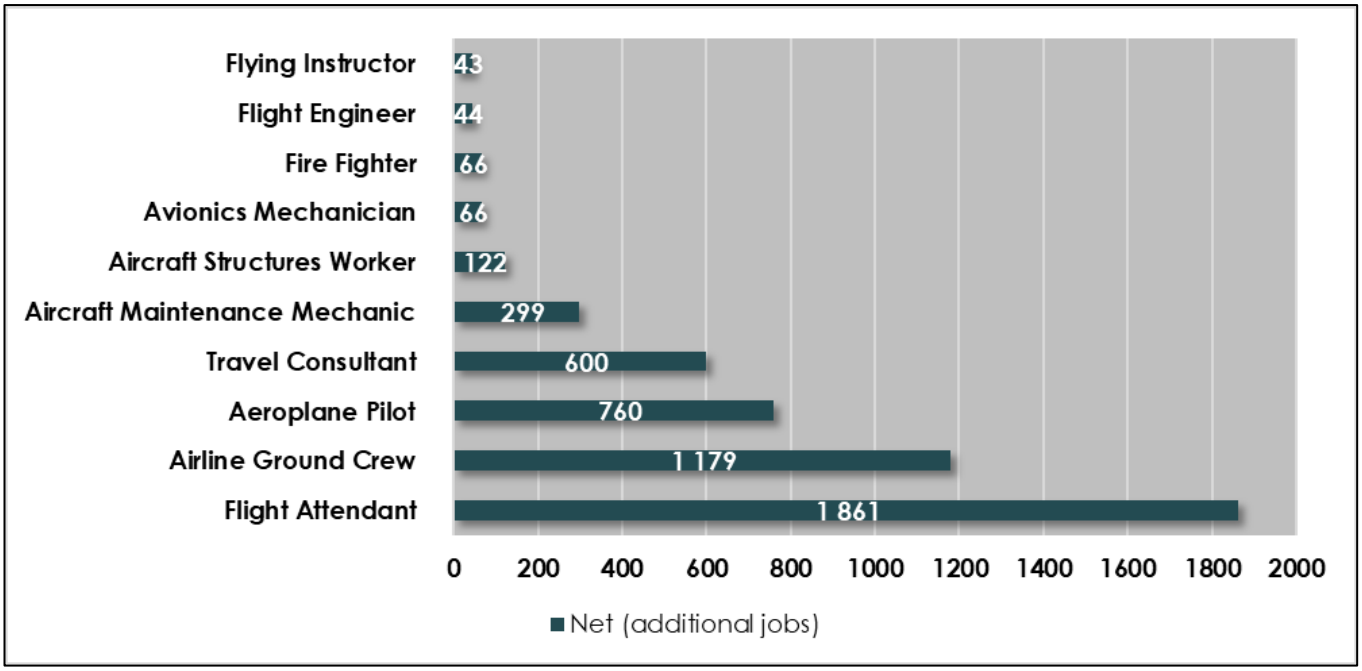

Figure 7-18: Net additional prioritised jobs for the Aerospace Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Aerospace Chamber are contained in the table below:

Table 7-22: Aerospace: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Commercial Cleaner	4%	1 966	302
Truck Driver (General)	3%	1 579	242
Production / Operations Supervisor (Mining)	1%	655	101
Production Coordinator	1%	614	94
Security Officer	1%	595	91
Transport Clerk	1%	524	80
Coating Machine Operator	1%	501	77
Clearing and Forwarding Agent	1%	369	57
Air Operations Officer	1%	350	54
General Clerk	1%	313	48
Total	15%	**7 466**	**1 145**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, although some of the non-prioritised occupations should be contained in the prioritised occupations, none of the top non-prioritised occupations dominate the Aerospace landscape.

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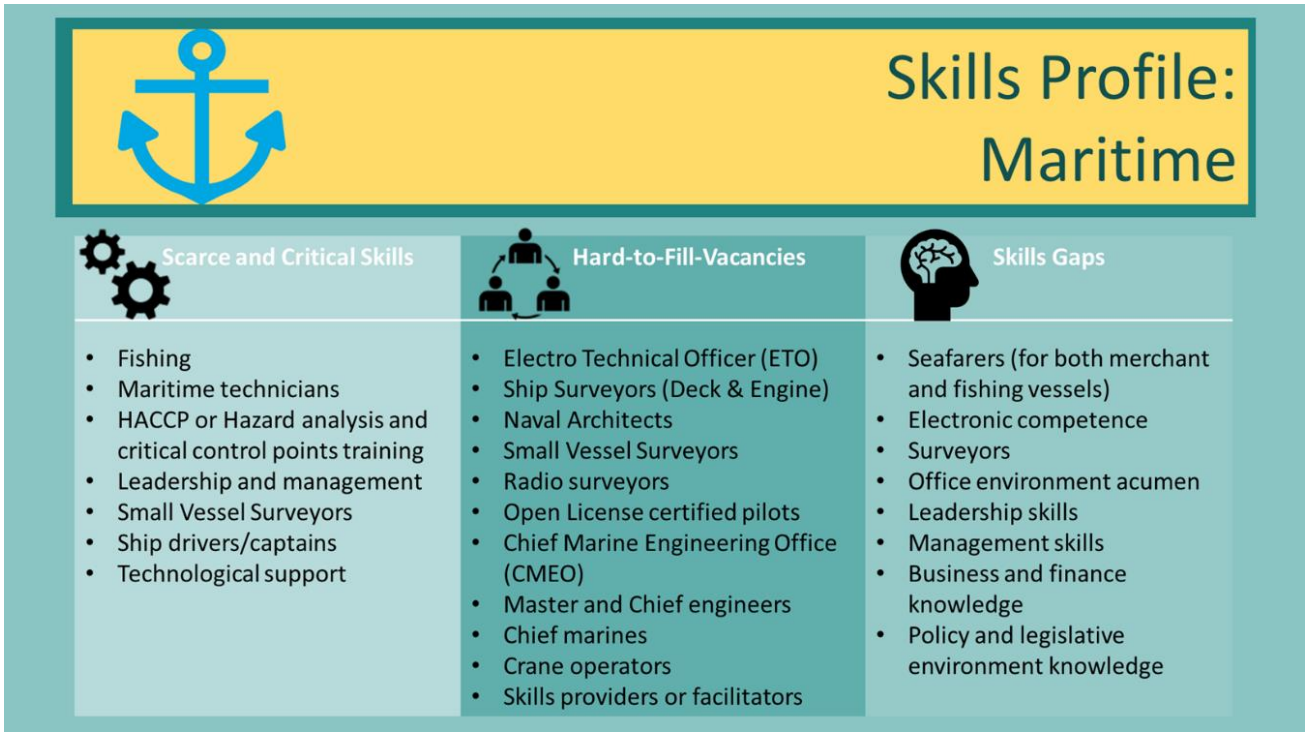
7.2.6 MARITIME

According to the stakeholder engagements, there is an estimate of under 20 000 employees in the Maritime sub-sector characterised by a labour profile of +/- 80% semi-skilled, skilled to professional. Employee numbers have dropped significantly in recent years due to the industry being linked to other key sub-sector and being integrated into the economic activities of other sectors, Transnet moved its port operations to the Rail Chamber. The sub-sector is primarily divided into two segments, namely vessel and logistics. The logistics aspect is shore-based and includes management, supporting or ancillary services, supply chain and administration. The Maritime sector, much like the Aerospace sector, is a highly regulated environment with the majority of workers having licenses for operations.

7.2.6.1 SKILLS PROFILE

Box 9: Maritime Skills Profile



Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Maritime sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

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The skills profile for the Maritime sub-sector following the above definitions appear to identify shortages that speak to the same scarce and skills gaps and occupational vacancies. For example, sea vessel surveyors are identified as a scarce skill, a skill that needs to be harnessed in workers, as well as an occupation that is hard to fill. The same is true for seafarers or ship drivers; Maritime electronic and technical skills as well as operators are in demand too. Furthermore, the vacancies that are hard to fill are supported by the lack of soft skills identified. This speaks to the industry's inability to groom or move existing staff up the ranks to fulfil roles in the needed areas because they lack the skills and critical competence. These are the occupations that require not only technical expertise but also business and financial acumen. Policy and legislative knowledge of the marine economy is critical too for an industry as highly regulated and involved as this.

Some of the respondents acknowledged that not all the skills identified as critical or vacant meant that they do not exist at all. The discrepancy lies with the type of equipment a chief operator is used to handling compared to where a new demand opens, for example, working with tankers and working with containers require a different set of skills.

Another example of skills not being transferable in the sector is seen in the work of seafarers. Seafarers generally work well on board and follow clearly defined systems and protocols, but when they are required to do office work, they find it difficult to cope. They lack the soft skills and do not know how to conduct themselves in an office environment. However, if seafarers received training that allows them to cross-over their skills, it will address the HTFV that are currently prevalent. The Maritime industry can never have enough seafarers and should endow them with transferable skills that are useful on deck as well as in back office.

Due to the highly regulated nature of the Maritime industry, changes are usually those affective at an international level. Some of the key international bodies that prescribe the laws and compliances at sea are the International Maritime Organization (IMO), the International Academy, Research and Industry Association (IARIA), and internationally accredited registrar DNV GL, who collectively focus on digitalisation, the ocean space, and ports issues among other sea-going focus areas. Thus, emerging trends in the sector must be adjusted into standards that business at sea must be kept up with. Skills changes and occupational advancements will therefore involve a slow and steady implementation process.

Domestically, qualifications are recognised and approved by SAMSA, a national government regulatory agency. SAMSA is reported to often find contention with the QCTO in respect to the qualifications permitted. Nevertheless, entry into the sector is achieved through advancement in a cadet scheme, mainly via two streams: engineering and navigation. A typical cadet scheme takes 12 months to 2 years in addition to other training interventions or earlier tertiary studies. Placements for cadets on international ships or vessels are made by SAMTRA, or at the very least, they find placements befitting of international requirements. South Africa currently only has a small number of berths/ports, not enough to accommodate the large numbers of cadets in schemes. With regard to safety and survival skills, there are a number of legislated refresher skills programmes that must be taken to retain operational licenses.

Against the future needs of the industry, for comparative insight, the current and dominant skills and occupations in the Maritime sector include seafaring (both on merchant vessels and fishing vessels), on deck workers, and certain engineering occupations. The introduction of automated processes will likely have a profound impact on already low employment numbers in the industry. The loading of containers by automation will become more efficient and cost-efficient. The only way to ensure that complete job losses do not occur is by upskilling and re-skilling employees according to emerging trends and developments. Individuals in the industry are required to be willing to adapt to changes and be flexible to accommodate the likely restructuring that will occur throughout the years. There is no scope for entitlement.

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7.2.6.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Maritime sub-sector.

The respondents have a bleak outlook for the future of the Maritime Chamber. The industry is considered too small in terms of income and the workforce does not justify the means to keep the industry alive. The industry's performance is directly reliant on the growth of imports and exports, SA does not have its own fleet taking cargo in and out of the country, which is not only a lost opportunity, but it hampers the development of the sector in terms of skills and occupational development. It is therefore suggested that Maritime or ocean freight activities be integrated with that of the Forwarding & Clearing sub-sector.

Skills trends

The skills focus of the Maritime sector will shift along those dictated by emerging international trends. The growth of occupations such as autonomous ship operators will become prevalent. The skill associated with this is programming as an operator will be controlling the steering of ocean-going vessels. Other occupations include techno surveyors, someone responsible for ensuring safety on unmanned or autonomous ships. Naval architects and ships agents are also becoming prominent. For the technologically related occupations, it will, however, take a long time before it becomes a profitable experience for countries such as South Africa.

Ships or sea-going vessels are becoming more modernised regardless of how the country does not have enough new vessels coming to the fore. The vessels that are registered limit access to work and skills since shipping companies look outside of the country for trained workers. Local qualifications in the sector are not always internationally recognised. To keep up with modern trends, resources are necessary for education and training to allow for skills development and job creation.

In terms of skills, many existing occupations in the sector will require up-skilling or reskilling to align with new technology and systems as they are being introduced. In the case of SA, should the sector become one with that of Forwarding & Clearing, skills will have to be adjusted to fit the new working environment. Many skills are likely to remain relevant but will just be integrated into the economic activities of another Chamber.

Challenges

The skills development challenges currently facing the industry include:

- Lack of capacity to train seafarers, get them the required recognition and to supply them to the international market.
    - The Philippines, as an example, trains over 30 000 seafarers, yet they have fewer flags than South Africa. The seafarers from the Philippines are well-qualified with international accreditation and therefore are not jobless. SA, on the contrary, has only trained about 7 000 seafarers on their books and not all them have jobs; 23% of trained seafarers in the country are unemployed.
- There is a mismatch with regards to skills being developed:
    - There is a growing international demand for seafarers while SA sits with hundreds of certified seafarers that are unemployed. Is SA not in the same market as the rest of the world?
- Many scarce and hard-to-fill-vacancies exist because Maritime qualifications lack recognition
- Not enough employment opportunities exist in the sector:
    - Skills development and training should be met with employment creation

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- There is not enough awareness of Maritime specialists or the SA Maritime industry in schools and among youth
- The STCW, or Standards of Training, Certification and Watchkeeping for Seafarers, is not recognised within the current South African qualification framework:
  - This leads to underfunding of institutions who provide STCW and STCW-F aligned qualifications. The DHET favours institutions that offer Masters and PhD qualifications – this is impractical for the Maritime industry.
  - No training facilities are thus provided for the STCW qualification
- Current domestic vessels are outdated and have no capacity for technological innovation
- Limitations on the service offering of the Transport SETA:
  - The funding is there, but so is the skills mismatch between demand and what is being supplied
  - Lack of transformation agenda and implementation in the sector
  - Discrepancy issues between Maritime activities and that of other economic sectors and SETAs

7.2.6.3 FUTURE DEMAND

An overview of the skills demand forecasting model results for the Maritime Chamber are contained in Table 7-23. The results show that the Maritime Chamber holds a 0,5% share of the overall anticipated occupations within the TETA landscape. The table also provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023.

The total anticipated jobs range between 4 652 and 4 848 (low and high scenario) with 4 750 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 700 to 758, with 729 being the median scenario, and most likely.

Table 7-23: Projected Net and Total labour demand for the Maritime Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Maritime	18%	0,5%	4 652	4 750	4 848	700	729	758

Source: UE 2018

Table 7-23 also provides the prioritised occupation share for the Maritime Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Maritime Chamber, are illustrated Figure 7-19. The anticipated additional occupations are revealed per year, for a low, median and high scenario. The number of new jobs expected for 2019 for range between 139 and 152. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 141 and 151.

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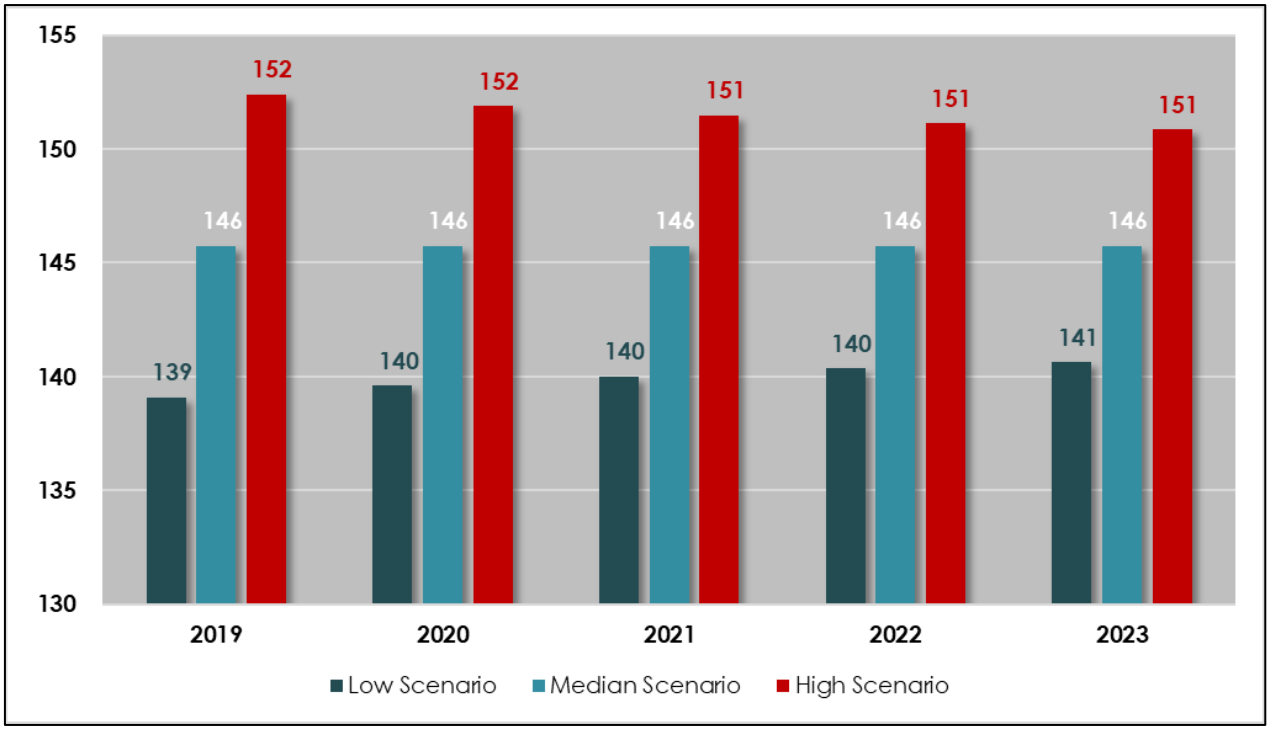

Figure 7-19: Projected Net (additional) jobs for the Maritime Chamber (2019-2023)

Source: UE 2018

Figure 7-20 below illustrate the total anticipated labour demand for the Maritime Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 4 091 and 4 243 jobs in 2019 to between 4 652 and 4 848 jobs in 2023.

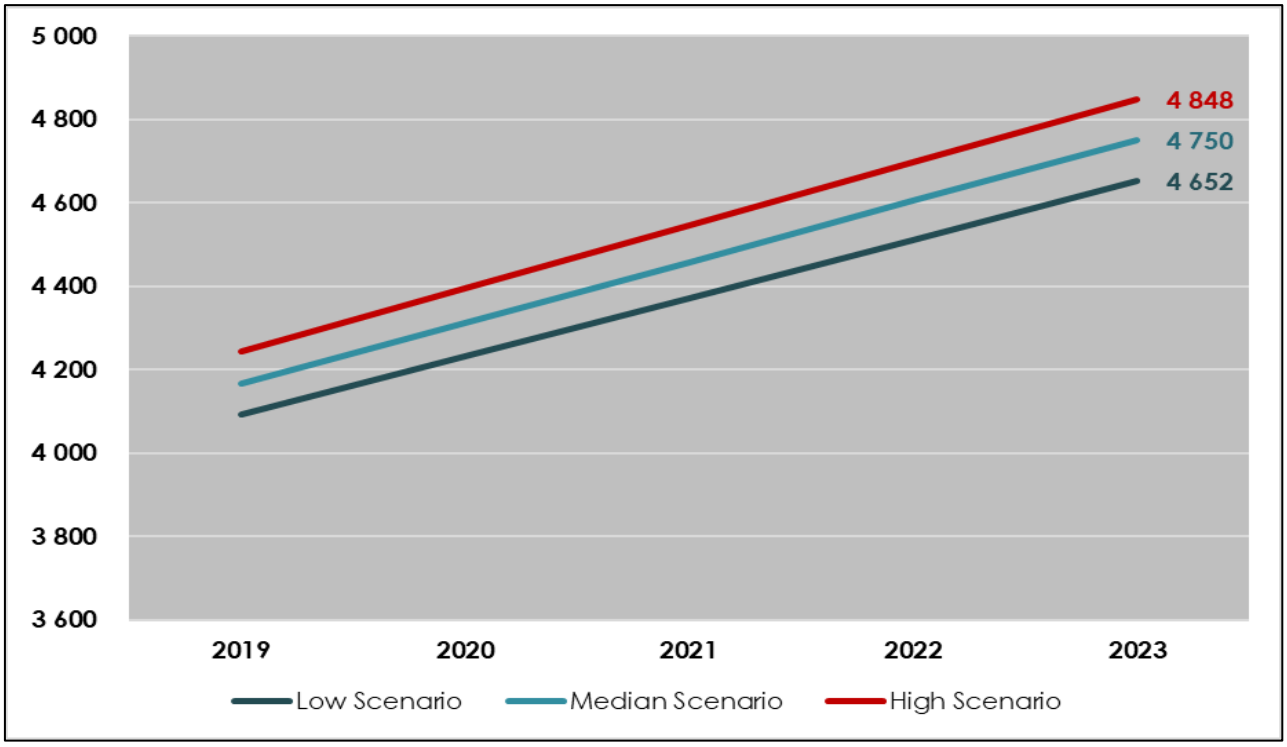

Figure 7-20: Projected total labour demand for the Maritime Chamber (2019-2023)

Source: UE 2018

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PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation for the prioritised occupations in the Maritime Chamber. Table 7-24 reveals that only 8 occupations were prioritised for this Chamber, which make up only **18% of the Chamber share**. The **deck hand** occupation makes up **8% of the total Chamber share**. The low Chamber share may indicate that the priority occupation focus may need to be adjusted.

The total top prioritised jobs identified for the Maritime Chamber adds up to 132 anticipated jobs, based on the median scenario forecasted figures.

Table 7-24: Maritime Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Deck Hand	8%	397	61
Ship's Master	5%	248	38
Ship's Officer	3%	124	19
Diver	1%	36	6
Marine Safety Officer	0,5%	23	4
Ship's Surveyor	0,4%	17	3
Airport or Harbour Manager	0,3%	15	2
Shipwright	0,02%	1	0
Total	**18%**	860	132

Source: UE 2018

The figure below illustrates the net additional jobs anticipated for each of the prioritised occupations:

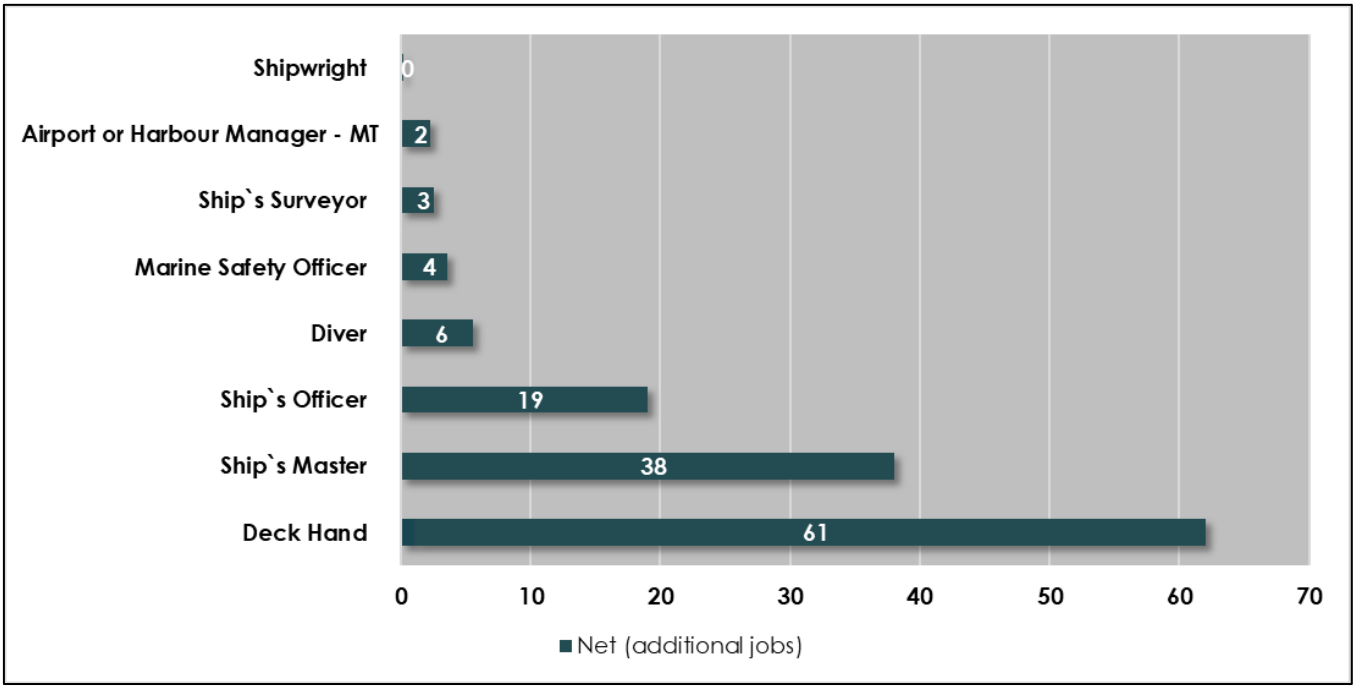

Figure 7-21: Net additional prioritised jobs for the Maritime Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Maritime Chamber are listed in Table 7-25 below:

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Table 7-25: Maritime: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Waterside Worker	8%	358	55
Crane or Hoist Operator	5%	216	33
Office Administrator	3%	143	22
Electrical or Telecommunications Trades Assistant	3%	129	20
Builder`s Worker	3%	124	19
Electrician	3%	120	18
Millwright	2%	110	17
Mechanical Engineering Technician	2%	105	16
Fire Fighter	2%	105	16
Production / Operations Supervisor (Manufacturing)	2%	103	16
Total	**32%**	**1 514**	**232**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that the top 10 non-prioritised occupations collectively occupies a greater share of anticipated additional jobs than all the prioritised occupations. The fact that the top 10 non-prioritised occupations make up 32% of the occupation share indicates that the priority focus for the Chamber is too narrow.

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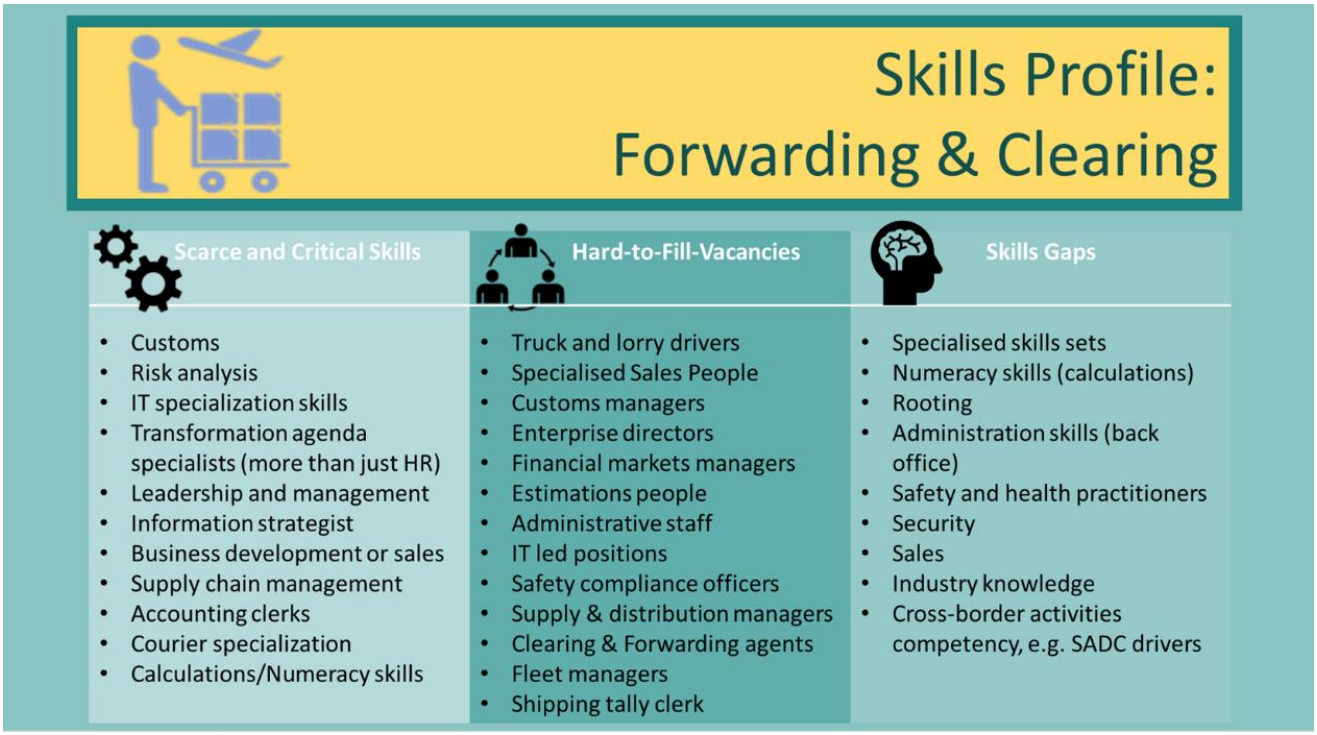
7.2.7 FORWARDING & CLEARING

According to the stakeholder engagements, there are at least 24 000 people employed in this sector and it is characterised by a labour profile of +/- 70% skilled to professional workers. The Forwarding & Clearing sector is regarded as high-impact and mostly a white-collar industry concerned with the legal and contractual side of imports and exports. The sector facilitates about 90% of international trade in SA and is considered as the support services for all other modes of transport. Some entities over time have added value to their business by offering distribution and warehousing services. The required qualifications in the industry range between NQF 4 (Grade 12) and NQF 10 (PhD).

7.2.7.1 SKILLS PROFILE

Box 10: Forwarding & Clearing Skills Profile



Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Maritime sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

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The scarce and critical skills identified for the Forwarding & Clearing sub-sector comprise those mostly needed in customs, business processes and supply chain. Sales or business development, along with accounting and numeracy skills (for estimations, including calculating for rooting and risk analysis) are also considered scarce in the industry. This is supported by the skills gaps identified in the third column. There is thus an interdependence of the critical skills needed in the sector with those that are not currently inherent in workers to fulfil. The underlying role of soft skills in this sector is necessary to develop workers with the required competencies in the industry. It is more cost effective to upskill or re-appoint people than to bring in hordes of new employees to fulfil existing roles.

Knowing how to work with people and having numeracy skills are vital to most of the jobs in the sector and yet many of the workers are not competent in this regard. They are well-equipped to handle operational procedures, but the changing-nature of the environment requires they are adept to more than just technical ability. The sector is growing into broad-based business that includes marketing and being able to sell the brand, its products and services. Industry knowledge is just as important for many of the cross-border activities that take place in Forwarding & Clearing. Drivers should know SADC country regulations and have the ability to effectively communicate in Portuguese- or French-speaking countries.

Among the vacancies identified as hard-to-fill are professional truck or lorry drivers, supply and distribution management, shipping tally clerks, clearing and forwarding agents, and customs managers who can take and make a calculated business call. There are a lot of professional occupations that make the HTFVs list; some of them are traditional roles, and some are part of the emerging roles in the industry, such as those that require ICT competence and increased international business/financial acumen.

Against the skills and occupations that are in demand or are developing, it is worth noting the ones that currently dominate in the sector, for comparative insight. The stakeholders engaged identify customs workers, freight forwarding agents, clearing agents, and dispatch and receiving clerks as those that are currently dominant in the sector. The occupations that are driven by emerging needs are those backed by knowledge and experience of Finance with a specialisation in customs, for example.

Other occupations involve knowledge and expertise in insurance, safety and security measures. The industry needs people who fall under the transformation agenda as specialists and not just for HR compliance; this is important to ensure that changes are implemented against the laws of the international standards the industry has to comply with. Sales specialists as vacancies that are emergent and yet vacant are necessary for SA enterprises to attain an international competitive advantage in trade. This is in line with the industry's need for business improvement as well as supply chain specialists.

7.2.7.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Forwarding & Clearing sub-sector.

The impact of skills development in the sector in the past five years is perceived as relatively positive. The industry has seen more SETA funding where relevant; employers received incentives for their skills development initiatives; improved stakeholder relationships were developed as a result of skills and training programme development and implementation. There has also been a lot of management and executive buy-in, which does good for investment into the industry. The sub-sector has also seen increased productivity, increased credibility of qualifications, and higher skills and staff retention. These positive attributes bode well for the sustainability and professionalisation of Forwarding & Clearing activities going in the future.

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In terms of performance, SA tends to lag behind leading industries in the USA and Europe. Local companies not only lack innovation, but they are not exporting enough which impedes on the expansion of the country's international trade. A lack of economic growth in the sector brings forward the question of whether investment in up-skilling and reskilling staff will be profitable in the long run. Many of the bigger players have had to downsize in recent years or are being bought out by multinational corporations. In light of this, training authorities are coerced to consider the relationship between updating occupational skills programmes and the funding available for them. Training spend should also be in alignment with people receiving jobs at the end of their skills training.

Skills trends

Presently, the key focus areas for skills development programmes in the sector are seen in strategic and value creating roles such as business process engineers, industrial engineers and supply chain engineers. These roles require specialised skills sets and takes cognisance of the evolving methods of business the world over; it includes preparing staff for strategic executive and managerial responsibility that extends beyond merely supervisory responsibility. Other skills focus areas are those that involve competency in IT and digitally integrated systems. There is a great threat of employees becoming redundant if their skills are not updated in accordance with emerging industry trends. Project managers, business process analysts and customs compliance managers with a future outlook are receiving attention too.

Challenges

The skills development challenges currently facing the industry include:

- Skills are becoming more strategic. SETAs can't keep up with requirements, and as a result many occupations are becoming redundant
- No strategy in place to capacitate transportation with emerging business processes such as supply chain
- Funds distributed are not on time; not enough are not provided at all
- Industry slow to developing trends
- Training and skills development curricula and syllabus are outdated
- No effective use or understanding of the transformation agenda within the industry
- Limitations on the service offering of the Transport SETA:
    - Funding not in line with the levies companies are paying for training and skills development
    - Money is put into TVET colleges with no consideration of the needs of the industry
    - The sector needs certified learning but Education and Training Quality Assurance (ETQA) is not provided
    - Structural incapacity
    - Not enough administration abilities; efficiency is not run in accordance with business imperatives, no focus
    - Lack of consistency; rules and their interpretation are constantly changing
    - Lack of effective communication between role players

7.2.7.3 FUTURE DEMAND

An overview of the skills demand forecasting model results for the Forwarding & Clearing Chamber are contained in Table 7-26. The results show that the Forwarding & Clearing Chamber holds approximately 5% share of the overall anticipated occupations within the TETA landscape. The table also provide an overview of the total anticipated jobs and net (additional) jobs expected by 2023.

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The total anticipated jobs range between 42 285 and 44 070 (low and high scenario) with 43 177 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 6 360 to 6 888, with 6 624 being the median scenario, and most likely.

Table 7-26: Projected Net and Total Labour Demand for the Forwarding & Clearing Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Forwarding & Clearing	13%	5%	42 285	43 177	44 070	6 360	6 624	6 888

Source: UE 2018

Table 7-26 also provides the prioritised occupation share for the Forwarding & Clearing Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Forwarding & Clearing Chamber are illustrated in the table below. The anticipated additional occupations are revealed per year, for a low, median and high scenario. The number of new jobs expected for 2019 for range between 1 264 and 1 385. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 1 278 and 1 371.

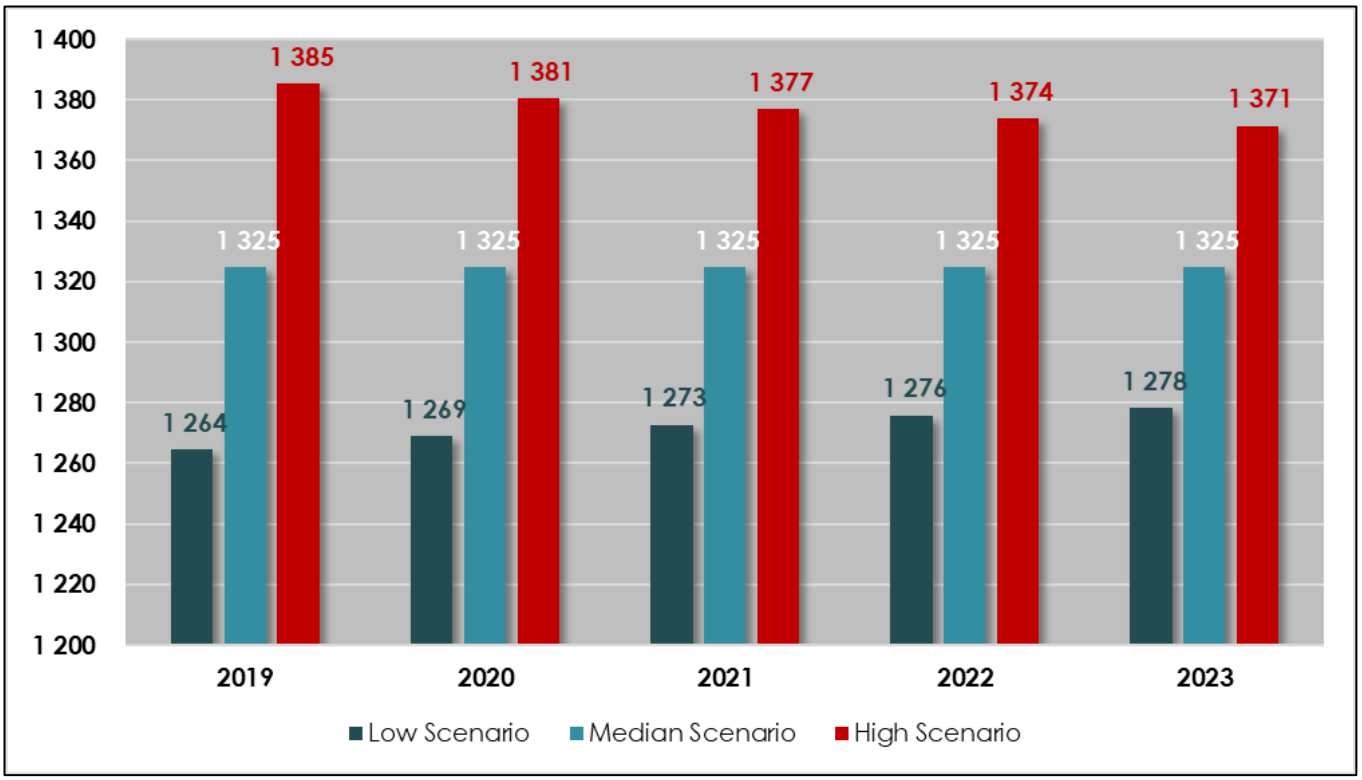

Figure 7-22: Projected Net (additional) jobs for Forwarding & the Clearing Chamber (2019-2023)

Source: UE 2018

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The figure below illustrates the total anticipated labour demand for the Forwarding & Clearing Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 37 189 and 38 567 jobs in 2019 to between 42 285 and 44 070 jobs in 2023.

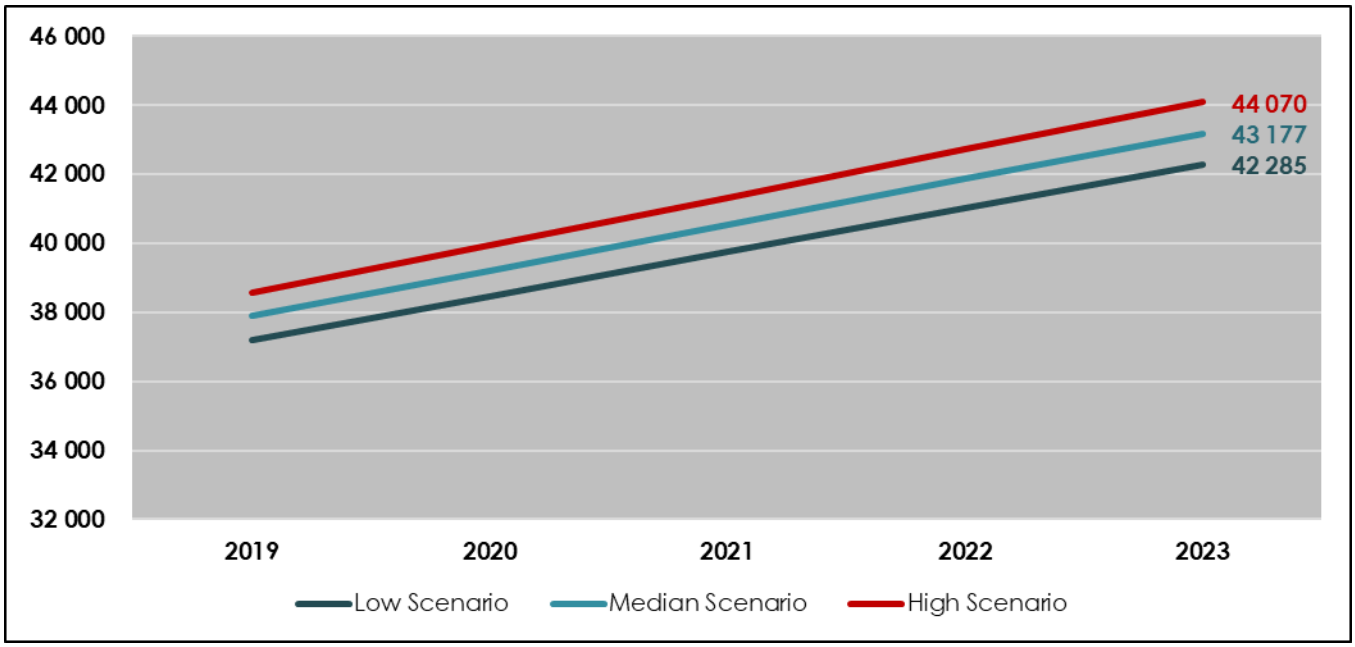

Figure 7-23: Projected total labour demand for the Forwarding & Clearing Chamber (2019-2023)

Source: UE 2018

PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Forwarding & Clearing Chamber. Table 7-27 reveals that only 7 occupations were prioritised for this Chamber, which make up only **13% of the Chamber share**. The **clearing and forwarding agent** occupation make up **7% of the total Chamber share**. The low Chamber share may indicate that the priority occupation focus may need to be adjusted.

The total top prioritised jobs identified for the Forwarding & Clearing Chamber adds up to 854 anticipated jobs, based on the median scenario forecasted figures.

Table 7-27: Forwarding & Clearing Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Clearing and Forwarding Agent	7%	2 969	456
Supply and Distribution Manager	2%	875	134
Sales and Marketing Manager	2%	834	128
Supply Chain Practitioner	1%	461	71
Warehouse Manager	1%	348	53
Purchasing Officer	0,1%	51	8
Fleet Manager	0,1%	28	4
Total	**13%**	**5 568**	**854**

Source: UE 2018

The figure below illustrates the net additional jobs anticipated for each of the prioritised occupations. The figure reveals the dominance of the clearing and forwarding agent occupation as compared to the other prioritised occupations.

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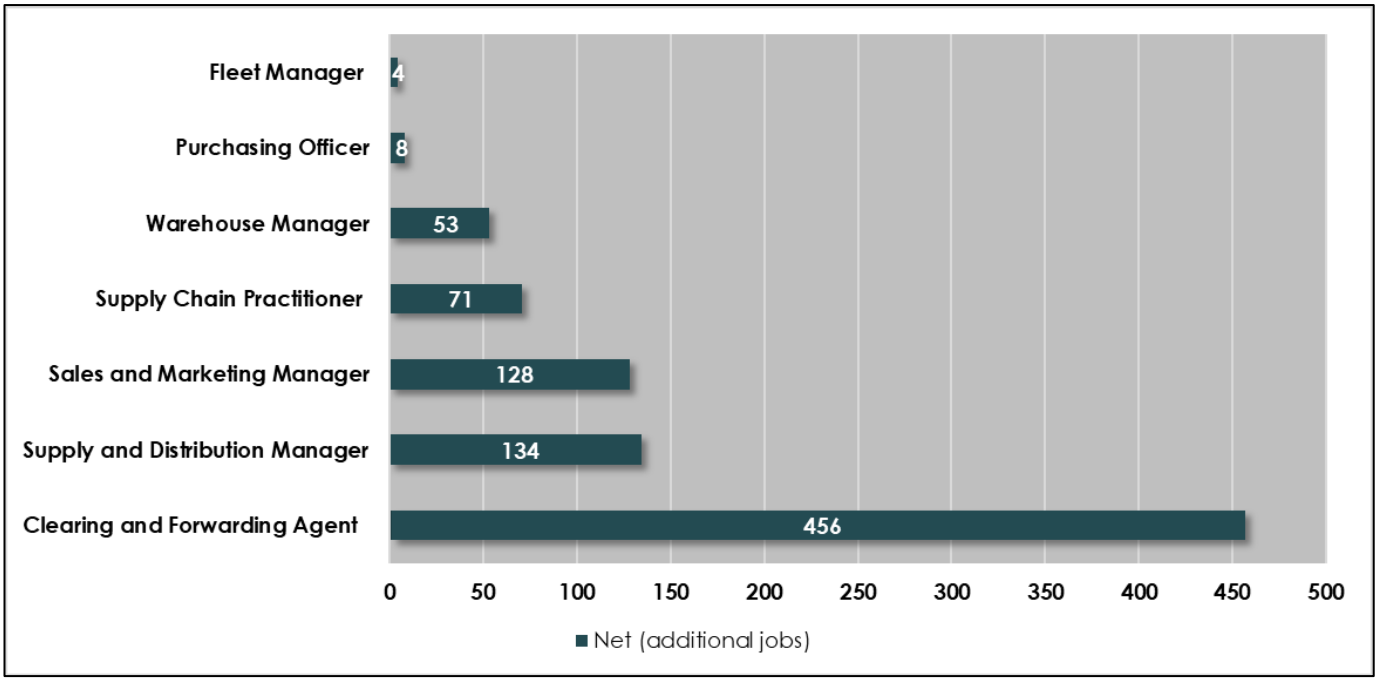

Figure 7-24: Net additional prioritised jobs for the Forwarding & Clearing Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Forwarding & Clearing Chamber are listed in Table 7-28 below:

Table 7-28: Forwarding & Clearing: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Import-export Administrator	12%	5 244	805
General Clerk	9%	3 941	605
Accounts Clerk	6%	2 387	366
Forklift Driver	4%	1 919	294
Corporate General Manager	4%	1 802	276
Delivery Driver	4%	1 545	237
Truck Driver (General)	3%	1 296	199
Dispatching and Receiving Clerk / Officer	3%	1 270	195
Courier	2%	1 062	163
Freight Handler (Rail or Road)	2%	931	143
Total	**50%**	**21 396**	**3 282**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that for the **import-export administrator** occupation, more additional jobs are anticipated than the top four prioritised occupations. The fact that the top 10 non-prioritised occupations make up 50% of the occupation share as opposed to 13% of prioritised occupations indicates that the priority focus for the Chamber is too narrow.

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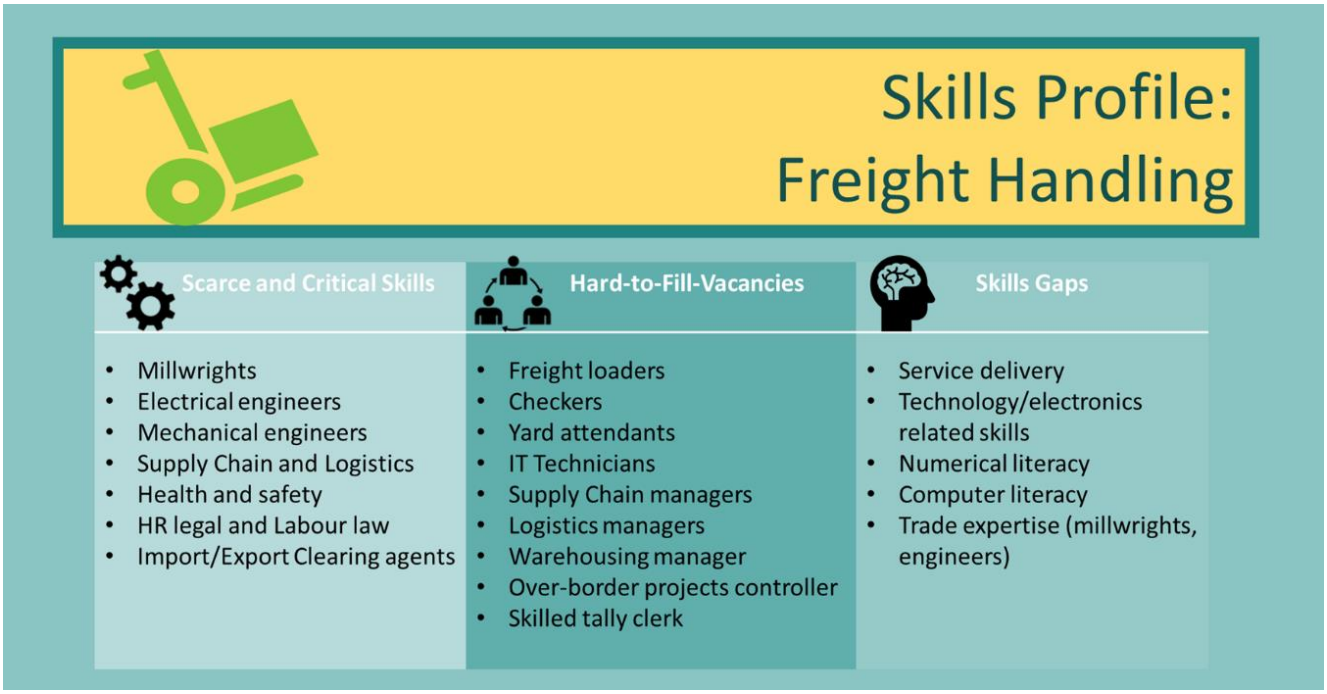
7.2.8 FREIGHT HANDLING

According to the stakeholder engagements, there are at least 25 000 people employed in the Freight Handling sector, characterised by a labour profile of +/- 70% unskilled to semi-skilled workers; however, all handlers are required to have part-qualification/licensing. The sector mainly employs casual labour or temporary employment. If there are no ships there is no work. The sector's biggest employer is Richards Bay due to the coal exports in the region. Labour is male-dominated, with a workforce of 50+ years old.

7.2.8.1 SKILLS PROFILE

Box 11: Freight Handling Skills Profile



Source: Urban-Econ, 2018.

The image above depicts the skills profile of the Maritime sub-sector by listing the key skills and occupations identified as important but not available in the sector.

- **Scarce and Critical Skills** are the skills that are in demand currently or in the future. They are generally the professions, occupations or specialisations needed for an industry to fulfil labour market requirements.
- **Hard-to-Fill-Vacancies or HTFVs** refer to the jobs within companies or the industry that are difficult to fill because there is a lack of suitably skilled, qualified, and experienced people, currently or anticipated.
- **Skills Gaps** are the capabilities required to perform tasks that are specific to a job/occupation or the general nature of the business within the industry.

The scarce and critical skills identified for this sector are tradespeople in the industry such as millwrights and import/export clearing agents. Other scarce skills identified include selected engineering and law knowledge, as well as health and safety measures and compliance. The vacancies identified as hard-to-fill include manual labour for the moving and handling of freight, yard attendants and checkers. The more

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technically inclined occupations that are HTFV are those that are IT-related concerns logistics, warehousing and the flow of cargo. Managerial roles are identified as HTFVs too. The vacancies and critical skills identified for the sector as scarce is problematic. It will be difficult to simply advance current employees into these roles since majority are low-skilled, not employed long enough to acquire the necessary competence and experience, and/or are too old to learn to tricks.

The skills gaps or soft skills identified are related to know-how around technology and electronics. These include being competent in in-service delivery, having basic numeracy and computer literacy skills, and a bit of trade expertise to at least ensure that current workers remain employable. Key work activities such as scheduling is already being done electronically, and freight cranes use computerised technology, therefore those that are slow to adapt will be left behind.

Against the skills and occupations that are in demand or are developing, it is worth noting the ones that currently dominate in the sector for comparative insight. All freight moving and handling activities remain dominant, as well as office-support occupations such as secretarial and administrative jobs. The introduction of more computerised operations with have a profound impact on an already aging and low-skilled labour market. One way of preventing drastic job losses is by up-skilling and re-skilling employees. The industry would also do well in the future by employing youth in critical segments that are flexible to the demands of an evolving environment.

7.2.8.2 SKILLS, TRENDS AND CHALLENGES

This section discusses the skills, trends and challenges identified through the stakeholder engagements for the Freight Handling sub-sector.

The impact of skills development in the sector in the past five years is not easily discernible. There appears to have been a lot of positive changes, with learners responding well to the programmes; however, they are not being absorbed into the job market. The focus areas for skills development programmes in the sector revolve around the need for workers to understand their roles, the industry and how this can be furthered beyond just operational practices. Workers are implored to ask questions such as, "Why am I driving a forklift in a certain manner?" They cannot be up-skilled or reskilled when they do not understand the functions of their current roles. Other focus areas are building competence in mathematics and communication skills.

Skills trends

The skills focus of the Freight Handling sector will eventually shift along those dictated by emerging international and technologically motivated trends. At present, however, workers in the field are known to struggle with adapting to new technology and computerised operations. A large aspect of this difficulty to be flexible to changes is the low-skills level among the workers. In addition, they also have very low levels of literacy and numeracy competence. Majority of the current workforce is composed of LMOs or loading machine operators, around the age of 50 and above. The degree of difficulty in up-skilling and reskilling this group is rather hard. There is also a stigma surrounding ABET, that it is only for 'dumb' people. Many labourers are thus reluctant to undergo the necessary training.

Nevertheless, the sector will have to succumb to new skills sets led by technology and other tools for improved efficiency. Competencies and capabilities of the workforce will have to accommodate the growing needs of the Transport industry as well as changes in current processes. In light of this, respondents suggest that occupations such as project management and change management will become essential in transforming the sector into a labour market that will not quickly become irrelevant. The role of the 4IR in

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the Transport industry cannot be ignored any longer. Knowledge, flexibility and being multiskilled will characterise the modern-day employee. The sooner South African labourers in the Freight Handling sub-sector realise this, the sooner they can be helped to avoid unemployability.

Challenges

The skills development challenges currently facing the industry include:

- Low literacy levels in the workforce
- Workers attitude
- Inefficacy of current learnerships
    - A qualification like the FIATA diploma is an example of a more sustainable approach
- Lack of youth involvement in the industry; workforce is aging and slow to adapt to new trends
- Train youth at a younger age, introduce learnership components at school level – see German apprenticeship programmes as working examples
    - The parrot approach to learning hampers real skills training progress
    - Youth do not enjoy the learnership programmes – training authorities to find out why
- The youth do not perceive the industry as affluent enough
- Companies are not willing to send staff to training because they say they have few staff members, and cannot afford to have them away from work to attend a training session. Future Demand

An overview of the skills demand forecasting model results for the Freight Handling Chamber are contained in Table 7-30. The results show that the Chamber holds approximately 18% share of the overall anticipated occupations within the TETA landscape. The table also provides an overview of the total anticipated jobs and net (additional) jobs expected by 2023.

The total anticipated jobs range between 170 543 and 177 743 (low and high scenario) with 174 143 being the most likely number of total jobs. The anticipated additional new jobs from 2019 to 2023 range between 25 652 to 27 780, with 26 716 being the median scenario, and most likely.

Table 7-29: Projected Net and Total Labour Demand for the Freight Handling Chamber

Chamber	Prioritised Occupations Share	Overall Share	Total jobs (2019-2023)			Net (additional) jobs (2019-2023)		
			Low Scenario	Median Scenario	High Scenario	Low Scenario	Median Scenario	High Scenario
Freight Handling	11%	18%	170 543	174 143	177 743	25 652	26 716	27 780

Source: UE 2018

Table 7-29 also provides the prioritised occupation share for the Freight Handling Chamber. The ***prioritised occupation share*** is the share the priority occupations make up of all the occupations in each Chamber. This allows an interpretation on whether the priority focus areas for the specific Chamber is representative of the occupational demand as expressed through the ATR results. In this regard, ***a low percentage share may indicate that the priority occupations focused on by the Chamber may be too narrow, resulting in key significant occupations not receiving the necessary attention.***

The net (additional) anticipated occupations for the Freight Handling Chamber are illustrated in Figure 7-25. The anticipated additional occupations are revealed per year for a low, median and high scenario. The number of new jobs expected for 2019 for range between 5 099 and 5 587. The number of additional jobs per year decreases slightly every year for the high scenario, stays the same for every year for the median scenario, and increases slightly every year for the low scenario. The number of new jobs expected for 2023 thus range between 5 155 and 5 531.

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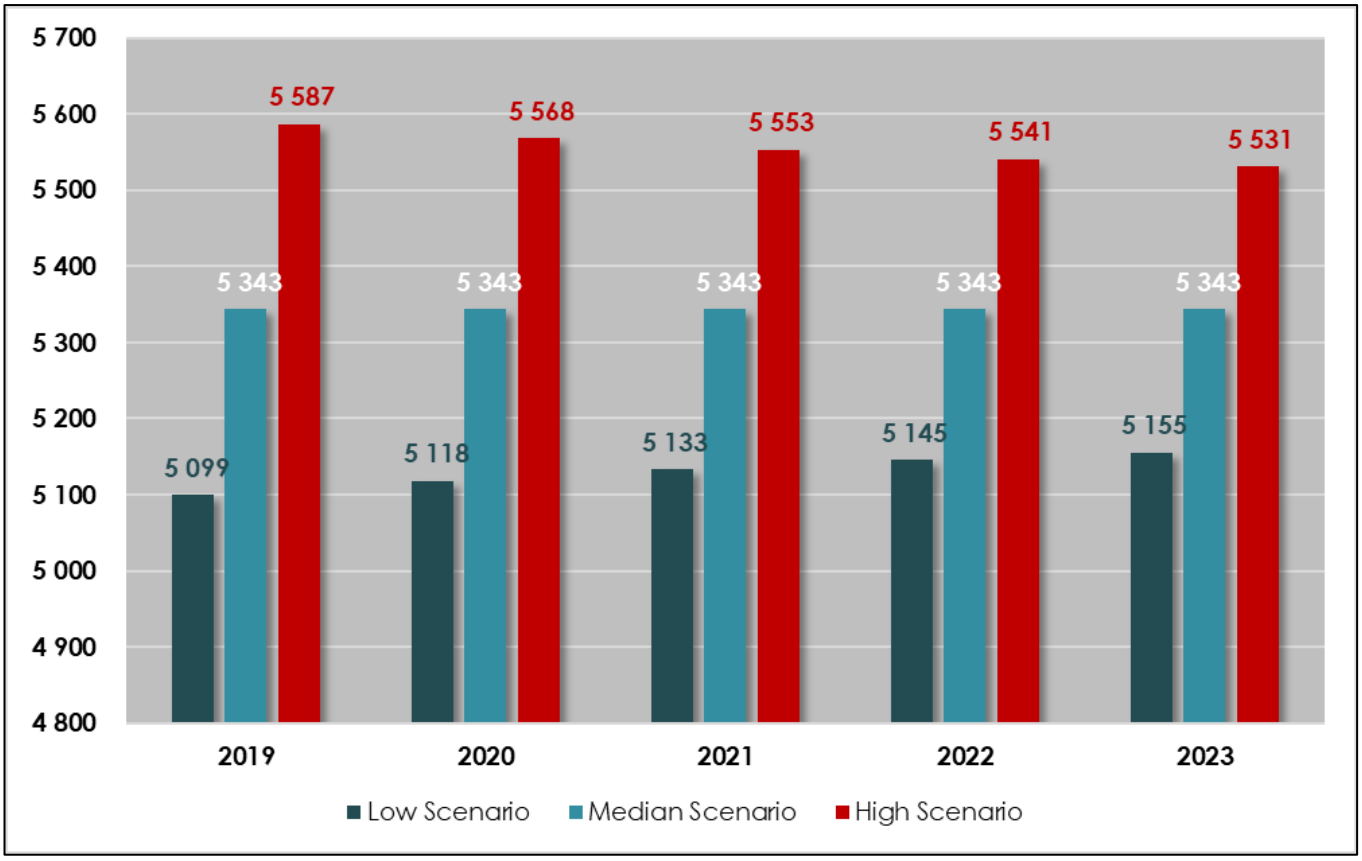

Figure 7-25: Projected Net (additional) jobs for the Freight Handling Chamber (2019-2023)

Source: UE 2018

The figure below illustrates the total anticipated labour demand for the Freight Handling Chamber between 2019 and 2023. The graph shows the trajectories for the three growth scenarios. From 2019 to 2023, the total number of occupations are projected to grow from between 149 990 and 155 550 jobs in 2019 to between 170 543 and 177 743 jobs in 2023.

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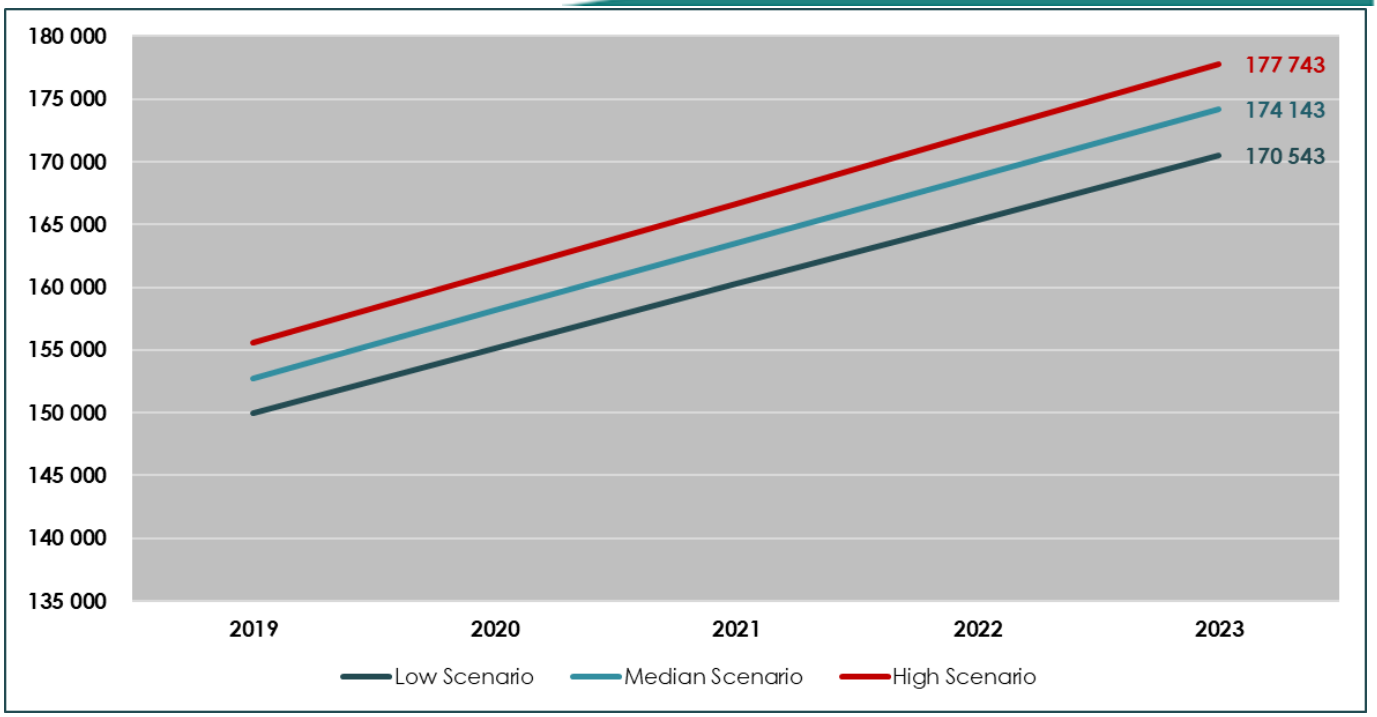

Figure 7-26: Projected total labour demand for the Freight Handling Chamber (2019-2023)

Source: UE 2018

PRIORITISED OCCUPATIONS

The following table provides the total and net demand (additional jobs) figures per occupation, for the prioritised occupations in the Freight Handling Chamber. Only 9 occupations were prioritised for this Chamber, which make up only **11% of the Chamber share**. The top prioritised occupation, **truck driver (general)**, makes up only **4% of the total Chamber share**. The low Chamber share may indicate that the priority occupation focus may need to be adjusted.

The total top prioritised jobs identified for the Freight Handling Chamber adds up to 2 884 anticipated jobs, based on the median scenario forecasted figures.

Table 7-30: Freight Handling Chamber: Anticipated demand for prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Truck Driver (General)	4%	6 168	946
Store Person	2%	3 414	524
Forklift Driver	2%	2 896	444
Freight Handler (Rail or Road)	2%	2 864	439
Supply and Distribution Manager	1%	1 273	195
Crane or Hoist Operator	0,4%	688	106
Warehouse Manager	0,4%	662	102
Stock Clerk / Officer	0,3%	451	69
Logistics Manager	0,2%	380	58
Total	**11%**	**18 796**	**2 884**

Source: UE 2018

The figure below illustrates the net additional jobs anticipated for each of the prioritised occupations. The figure reveals the dominance of the truck driver (general) occupation as compared to the other prioritised occupations.

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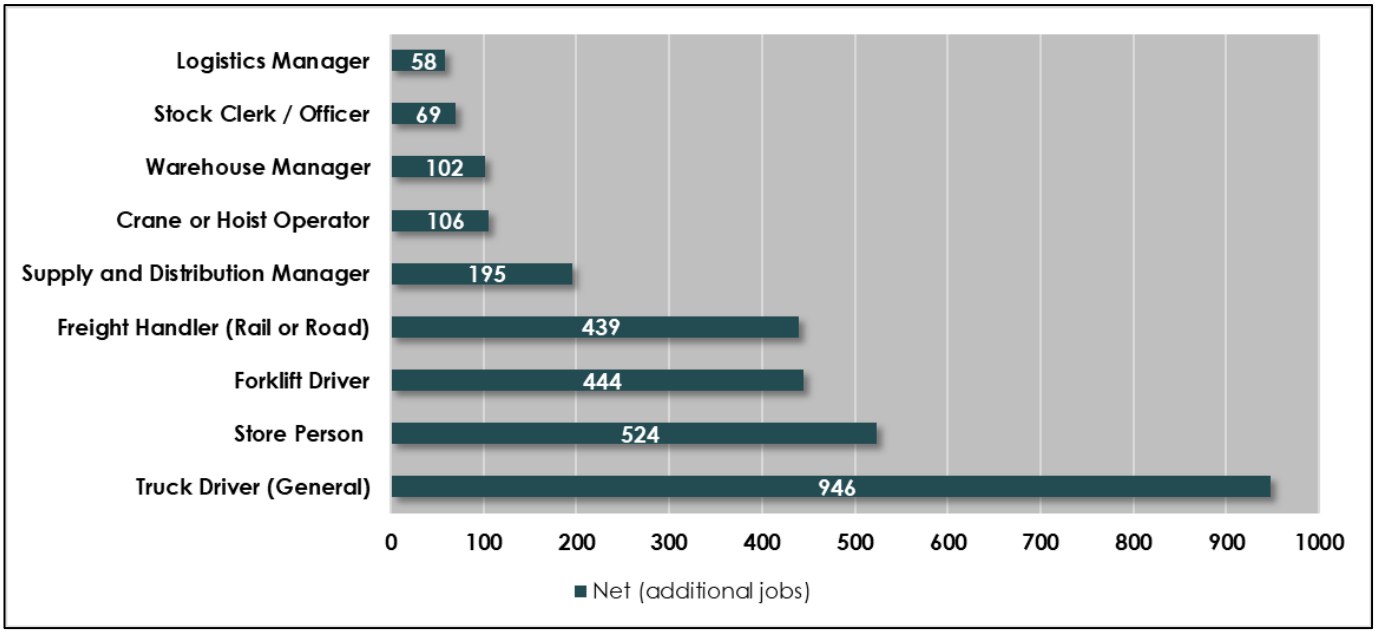

Figure 7-27: Net additional prioritised jobs for the Freight Handling Chamber (2019-2023)

Source: UE 2018

NON-PRIORITISED OCCUPATIONS

The top 10 non-prioritised occupations for the Freight Handling Chamber are listed in Table 7-28 below:

Table 7-31: Freight Handling: Top 10 anticipated demand for non-prioritised occupations (2019-2023)

Occupation	Share	Total jobs	Net (additional jobs)
Train Driver	12%	20 195	3 098
Railway Signal Operator	10%	17 554	2 693
Railway Track Worker	5%	8 955	1 374
General Clerk	3%	5 405	829
Electrician	3%	4 650	713
Operations Manager (Non-Manufacturing)	2%	3 721	571
Train Controller	2%	3 512	539
Waterside Worker	2%	3 459	531
Chauffeur	2%	3 455	530
Mechanical Fitter	2%	3 441	528
Total	**43%**	**74 347**	**11 406**

Source: UE 2018

When comparing the non-prioritised occupations to the prioritised occupations, it is clear that the top 10 non-prioritised occupations collectively occupies a greater share of anticipated additional jobs than all the prioritised occupations. The fact that the top 10 non-prioritised occupations make up 43% of the occupation share as opposed to 11% for prioritised occupations, indicates that the priority focus for the Chamber is too narrow.

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8. KEY FINDINGS AND IMPLICATIONS

Based on the knowledge gained from the preceding sections (through the literature review, economic overview and primary data gathering), this section puts forward key research findings and implications for future TETA planning and future engagements with the Transport sector.

The following key findings and its implications for the Transport sector have been identified:

Emerging Trends

The transport sector, being central to the functioning of most other sectors and industries, is particularly susceptible to and influenced by ***technological trends***.

Technology in the supply chain space is particularly concerned with streamlining processes and eliminating ineffective and time-consuming methods of transportation and freight handling.

The fourth industrial revolution (4IR) is likely to have the greatest influence on the transport sector. The 4IR is seeing the deployment of cyber-physical systems; merging physical, digital and biological processes to produce artificial intelligence; automated processes and real-time communication, reactions and ledgers (blockchain).

The emergence of the green economy and related green technology will also have a major influence on the transport sector. The introduction of alternative fuel, hybrid vehicles and electrical cars will not only influence the potential impact of the transport sector on the environment, but will see a change in transport infrastructure and environment.

Implications for the Transport Sector and TETA:

Emerging technological trends should be central to all thinking and planning for TETA. These and other trends will see the need for re-alignment and upskilling of existing skills, as well as the emergence of new skills.

WSP/ATR Participation Rate

WSP/ATR participation and submissions have been described as a ***cumbersome and complicated*** process. As a result, many companies (and in particular those companies that employ less than 50 people) do not participate.

Reportedly, the complicated and time-consuming process often leads to mistakes and information being captured incorrectly.

Implications for the Transport Sector and TETA:

The fact that many companies do not participate in the WSP/ATR process means that TETA does not have accurate information pertaining to employee numbers, training requirements and pertinent skills for each of the Chambers. This means that any planning done in terms of skills development does not take the needs of the entire transport industry into consideration, leading to a mismatch of programmes and industry needs. (This is particularly true if one considers that the sector is largely a small enterprise sector).

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SIC Demarcation Discrepancies

At present, the various ***activities*** included in TETA's jurisdiction are ***not aligned with the SIC 5th edition logic***.

The 'waste management' and 'ocean and coastal fishing' activities in particular are problematic. No disaggregated data is available for these activities, as they are reported on as part of the 'Agriculture, Hunting, Forestry and Fishing' and 'Other Community, Social and Personal Service Activities'.

Moreover, the official available statistical data breakdown according to the SIC codes are not disaggregated according to the different Chamber activities. For example, SIC code groups all land transport and transport via pipelines together, as well as all auxiliary transport together. This is further complicated by the fact that data from official sources are collated and reflected at a higher level (three digits) than what is used by TETA (five digits).

It was discovered that the Maritime Chamber is a very small Chamber, both in terms of skills levy contribution, as well as employment contribution. This, however, can be attributed to the narrow definition of Maritime currently followed in TETA, as well as the misalignment with SIC codes and what is understood under Maritime from a transportation perspective.

The Forwarding and Clearing Chamber has also evolved from just forwarding and clearing of freight, to the wider supply chain.

Implications for the Transport Sector and TETA:

Misalignment of activities and the inability to disaggregate the collated statistical data means that the official statistics could either represent broader or narrower sectors than those specifically falling under TETA's mandate.

Furthermore, reporting in line with TETA's Chambers cannot be done accurately. To obtain detailed Chamber profiles, TETA would be required to make informed estimates and inferences.

Funding Distribution

During the research process, it was identified that the current method of ***distribution of funding within TETA is not done according to levy paying contribution, nor to the size of the Chamber industry.***

It should be acknowledged that TETA faces challenges with regards to aspects of the industry it serves. The Taxi industry, although organised in some respects, is considered to be predominantly informal in nature. As a result, very few entities within this Chamber pay skills levies or submit WSP/ATR data – yet the taxi industry holds a significant proportion of employment contribution within the transport sector.

Implications for the Transport Sector and TETA:

TETA faces a very unique situation with regards to the distribution of funding. While Chambers with high rates of levy paying entities and WSP/ATR submission should be rewarded through reaping the skills benefits associated with TETA funding, Chambers with the greatest need for intervention and skills development cannot be overseen due to non-contribution of its entities.

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The nature of ***skills and occupation training is perceived*** by stakeholders ***to be about achieving targets*** (the number of people trained) ***instead of ensuring a career path*** for those within the industry.

A pertinent example of this is the fact that every year a predetermined number of individuals are trained to obtain their Commercial Pilot's Licence (CPL). However, after obtaining a CPL, an individual cannot be employed as a pilot for any commercial airline, as a considerable amount of additional flying hours is required to no longer be an insurance liability, and to eventually obtain an Air Transport Pilot's Licence (ATPL).

Implications for the Transport Sector and TETA:

Many individuals within the Transport Industry face the challenge of obtaining initial qualifications and competencies but are unable to bridge the gap to actually be employable within the sector.

The implications for TETA and the transport sector are that many of these individuals that are unable to advance their careers eventually leave the transport industry. This means that funding spent on specific training programmes have been fruitless. Furthermore, the fact that career paths are not being prioritised may see a shortage of specialised skills in the industry in the future.

A great challenge facing the transport industry relates to an aging workforce and the associated ***institutional knowledge that is being lost once these individuals retire***.

At present, there is no formalised 'knowledge and skills maintenance' programme in place to ensure that the expertise and knowledge is not lost but is carried over to the next generation.

Implications for the Transport Sector and TETA:

The loss of institutional knowledge and skills is often referred to as the 'knowledge drain'. The inability to retain or transfer knowledge and expertise could result in dire consequences for the transport industry.

The failure to retain and/or transfer knowledge and skills may see transport companies experiencing high employee turnover. This could result in higher costs for individual companies (associated recruitment and training costs) and an overall decrease in efficiency for the entire transport industry.

A number of stakeholders believe that many of the QCTO accredited ***qualifications are too broad, and not specific enough to address job requirements***. It was furthermore highlighted that not enough relevant part qualifications or areas of specialisation exist to address the needs of the transport industry.

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It is understood that prior to the introduction of a new QCTO accredited qualification, comprehensive consultations with the relevant SETA(s) and other industry stakeholders are undertaken. However, it has been highlighted that in many instances, SETAs do not have a clear understanding of industry needs, due to non-submission of WSP/ATRs. In this regard, many industry role-players will only realise that a qualification is not talking to their skills needs only after it has been implemented.

Implications for the Transport Sector and TETA:

Qualifications that are too broad, or do not talk to the needs of the industry, could lead to a case of skills mismatch or skills gaps in the industry.

Skills mismatch and skills gaps have implications not only for individual businesses, but for the industry as a whole. It could lead to lower job satisfaction for workers, loss of productivity and higher employee turnover. This all has the potential to lead to a decrease in GDP contribution of the transport sector.

Should qualifications continue to not speak to job requirements, the extreme case would be that employers seek to implement new technologies and automated solutions to replace certain skills. This could mean that the industry shows a low demand for specifically skilled labour.

Informal Skills Development

A significant component of the transport sector falls within the informal economy. Most of the informality is due to the minibus taxi industry.

There is a great need for training within the informal transport sector. At present, skills requirements from the informal economy side are underrepresented due to the lack of WSP/ATR submissions. This, however, does not mean that these skills and the informal industries should be overlooked – on the contrary, businesses and individuals within this space should be supported to ensure they can graduate to the formal economy and be able to establish themselves with the required skills.

Implications for the Transport Sector and TETA:

Assisting individuals and businesses active within the informal economy with skills development could lead to a scenario where individuals and businesses are able to graduate to the formal economy. This could lead to an overall increase in GDP for the transport sector as well as greater participation in WSP/ATRs and contribution towards the skills levy.

Forecasted Skills Interrogation

The skills demand forecasting model provides a forecast for all occupations within the eight Chambers, both prioritised and non-prioritised occupations. These results are contained in Section 7.

The results gained from the model are based on WSP/ATR submission data. WSP/ATR submission rates irrefutably influence the results. As such, each Chamber should critically interrogate and moderate the forecasted results. This is especially true for the taxi Chamber.

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Implications for the Transport Sector and TETA:

The advantage of the demand forecasting model is that it provides a sound basis for TETA to do its planning. The model furthermore gives a prioritised occupation share, which gives an indication whether each Chamber's focus is too narrow and whether it should shift its focus to ensure key significant occupations receive the necessary attention.

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9. RECOMMENDATIONS

This section puts forward a number of key recommendations based on the key findings discussed in Section 8:

Skills & technology alignment

TETA should ensure that all skills development programmes are in line with technological advancements. This will require constant research and engagement with industry stakeholders and training institutions such as TVET colleges, Universities, Universities of Technology, and specialised schools.

A great aspect of alignment will consist of constant up-skilling or top-up of existing skills to ensure employees stay relevant.

NSDP 2020 systems preparation

The New National Skills Development Plan (NSDP) will come into effect in 2020. With the new NSDP, WSP/ATR requirements and submissions will also need to be updated.

TETA need to ensure that 2019 is dedicated to ensuring its systems, institutional knowledge and resources are in place to effectively implement NSDP 2020.

Simplify WSP/ATR submission

As far as possible and permissible, WSP/ATR submissions should be simplified and standardised. This should especially be the case for small companies (50 employees or less).

A simplified WSP/ATR submission format and less tedious process would see WSP/ATR submissions increase, and the quality of submissions improve.

Engage with peer SETAs

TETA needs to engage with other SETAs on the SIC mismatch issue and consider a submission to the Minister to review the SIC demarcations and its implications.

This may require attending workshops to compare the different SIC code allocations between the SETAs and come up with logical redistribution suggestions.

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Refinement of TETA Chambers

TETA should undertake a process of relooking at its Chamber composition:

- TETA should look at broadening the **Maritime** definition, to incorporate the Sector Skills Model (as developed by SAMSA) into the **Maritime Chamber**
- The **Forwarding and Clearing Chamber** has evolved significantly in recent times. The scope of this Chamber is no longer contained to Forwarding and Clearing activities but include extended supply chain activities. This may warrant TETA to relook at its Chambers, and how it should realign to fit into the broader supply chain. If following SAMSA's logic, this could see Maritime, Forwarding & Clearing and Freight Handling merging.

Adjust the distribution of funds

The current method of funding distribution as deployed by TETA should be reviewed. TETA should investigate alternative ways of allocation of funds.

This may require TETA to come up with a formula to calculate the funding each Chamber received, taking the Chamber skills levy contribution, as well as the size of the Chamber into consideration.

Communication and engagement with training institutions

In order to ensure that transport related training programmes remain relevant, TETA should forge partnerships with relevant institutions offering transport specific programmes of relevance to the industry. This will assist in addressing the skills mismatches identified.

TETA could furthermore identify opportunities for institutions to offer specific transport programmes.

Training institutions include TVET Colleges, private colleges, Universities, Universities of Technology, and specialised schools.

Communication and engagement with industry

Stakeholders have identified a great need for TETA to engage with them on a more regular basis. To this end, it is important for TETA to relook at their current engagement practices and come up with a new engagement strategy.

In particular, TETA should ensure that it is engaging with the correct stakeholders to provide the relevant information regarding skills requirements and trends in the industry.

Engagements should also not be limited to Chamber Committees. Regular, focussed workshops should also be considered.

Consider longer-term projects

In 2019, most legacy qualifications will be phased out and only QCTO qualifications will be registered on the NQF.

The new qualifications require work-based learning. TETA should ensure that it can provide the relevant (budget) support in ensuring that individuals receive the relevant exposure (e.g. assisting individuals to go from CPL to ATPL etc.).

It is further recommended that TETA work with QCTO to ensure that the qualifications are specialised and tailored to the industry. TETA should also influence the formulation of part-qualifications to ensure greater specialisation.

This longer-term view is facilitated by the re-establishment of SETAs from 2020 as permanent structures – the 5-year re-establishment requirement will fall away creating the opportunity for SETAs to engage in long-term skills development interventions

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Consider funding skills transfer programmes

In order to avoid the 'knowledge drain', TETA should consider funding skills transfer and mentorship programmes.

These programmes should entail the enlisting the assistance of employees and experts in the transport industry nearing retirement. A formal programme could be put in place to ensure that the institutional knowledge is retained and transferred to younger generations within the transport industry.

Mentorship programmes should involve retired individuals and experts. This will not only benefit the industry and younger generations but provide a transitioning period for retirees.

Expand the scope of priority occupations

Results gained from the skills demand forecasting model indicate that most of the Chambers have a very narrow occupation focus.

The results are indicative of which occupations are considered important by the industry (based on WSP/ATR submissions).

TETA should interrogate the forecasted results and reprioritise occupations to ensure that key significant occupations receive the necessary attention.

It is further advised that TETA workshop the results with industry stakeholders to gain further insights into prioritising of occupations.

Training for informal occupations

It is recommended that TETA focus on the training of those considered to be employed in the informal economy. This relates largely to the Taxi Chamber.

Informal occupation training should be focussed on providing skills and qualifications to enable the individuals to become part of the formal economy, as well as to graduate these businesses they are engaged in, into formal businesses.

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10. CONCLUSION AND DIRECTION FOR FUTURE RESEARCH

The aim of this research, as stated in Section 1, was to profile the Transport Sector and conduct research into the Transport Sector Skills Profile. While recognising the stated research limitations, the aim of the research was achieved.

Various research methods were deployed, and many sources were consulted in an effort to verify and validate the key research findings and implications. Recommendations were put forward to address the key findings and implications.

Although this research project has been quite comprehensive, some gaps regarding future trends, and future skills and occupations that follow from the findings, exist. Two topics have been identified, which would benefit from future research – not only for TETA, but for the transport industry as a whole:

Investigate the impact of green technology on the existing infrastructure and workforce

Emerging trends indicate that the transport industry will become less reliant on fossil fuels and more reliant on green technology and electromobility.

At present, the skills, occupations and infrastructure supporting the transport industry are still based on fossil-fuel technology (combustion engines, mechanical skills etc.). In order to prepare the industry and to remain relevant, research into the potential changes to the industry and subsequent skills need to be done.

Conduct research into the anticipated change in skills and occupations with the change in technology (Autonomy, AI, Internet of Things etc.)

The advancement of technology, and specifically in line with the fourth industrial revolution (4IR) will see the emergence of new cyber-physical systems and processes. This has the potential to have a significant impact on the transport sector.

Currently, the South African transport sector relies on labourers who manage or undertake most transport related functions and processes – however, with the emergence of autonomous technology and artificial intelligence, the role of the labourer may drastically change.

It is recommended that TETA undertake a study on future jobs in using future foresight methodology to assist TETA in moving its planning beyond the identification of current skills towards long-term and future skills demand.

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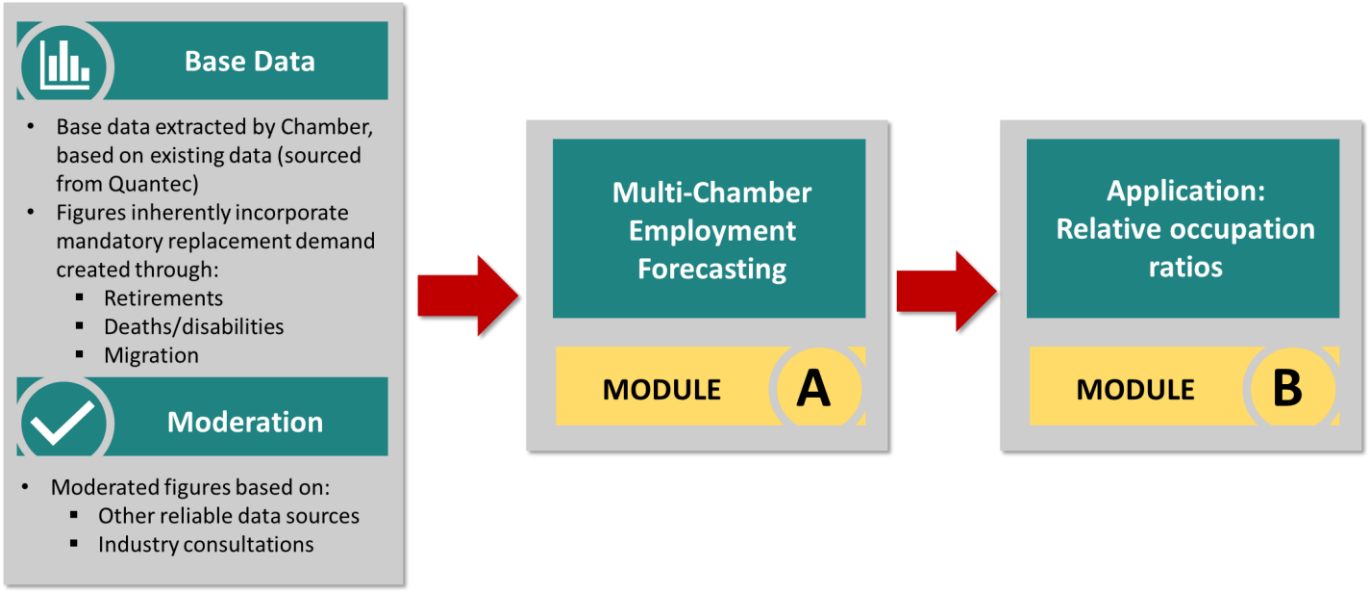
ANNEXURE A: U-E ECONOMIC AND LABOUR FORECASTING MODEL

The ***"U-E Economic and Labour Forecasting Model"*** *is a* skills demand forecasting model developed by Urban-Econ to assist SETAs to determine the demand for different occupations in the various sub-sectors demarcated to the specific SETA. The model has been customised to the transport sector to give the future projection of labour and skills demand (occupations) for the sector for the next five years.

The model has built-in development assumptions and formulas, which consists of two distinct steps (modules). These modules consider a number of influencing factors, indicators and parameters that may have a bearing on the total projected scarce skills demand, by chamber and occupation for TETA. These steps follow a logical order, as illustrated in the figure below:

Figure 0-1: Model outline



BASE DATA

The first of two precursory steps entailed the sourcing of labour data to inform Module A.
The labour force data was sourced from Quantec (as supplied by StatsSA) and collected at a national level for the relevant economic sub-sectors for a five-year period from 2011-2016. This labour force data, however, only provides data for the following SIC levels:

- Land transport, transport via pipe lines
- Water transport
- Air transport
- Auxiliary transport.

This high-level data in the published statistics made it difficult to accurately allocate employment data the relevant Chambers. Therefore, a further detailed breakdown of employment, as provided in a Quantec-developed Input-Output table from 2010, was used to determine the relative contribution of the following sub-sectors to the total employment for that year:

- Railway transport: Goods
- Railway transport: Passengers
- Road transport: Goods
- Road transport: Passengers

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- Transport via pipeline
- Water transport
- Air transport: Goods
- Air transport: Passengers
- Transport support services.

The relative ratios, as determined by the 2010 input-output figures, were applied to the labour force figures to allow for a more detailed breakdown of employment that could more easily be matched to the TETA Chambers. In order to match the TETA Chambers and activity allocations, some of the sub-sectors had to be merged, while some had to be split, as follows:

- 'Transport support services' were proportionally split (as informed by TETA employment databases and industry intelligence) into ***Freight Handling*** and ***Forwarding and Clearing***
- 'Transport via pipelines' were merged with ***Freight Handling***
- 'Road transport: Passengers' were proportionally split (as informed by published data and industry intelligence) into ***Road Passenger*** and ***Taxi***
- 'Railway transport: Goods' were merged with 'Railway transport: Passengers' into ***Rail***
- 'Air transport: Goods' and 'Air transport: Passengers' were merged into ***Aerospace.***

The data collected inherently and implicitly already incorporates mandatory replacement demand created through aspect such as:

- ***Retirements***
  The demand for labour due to persons in the labour force retiring (and thus needing to be replaced).
- ***Deaths and permanent disabilities***
  The demand for labour based on persons leaving the workforce due to death or permanent disability.
- ***Migration***
  The demand for labour based on persons leaving the workforce due to migration.

MODERATION

The second precursory step was to moderate the statistical data collected and allocated as described above, to ensure that it speaks to the industry reality.

The relative industry size, or the contribution ratio of each Chamber, was established through consulting both formal, published data (such as TETA employment databases, industry body publications etc.) as well as through industry consultations. This information was used to verify the statistical analysis/ base data used.

This step was particularly important to establish the accurate contribution of the Taxi Chamber and the Maritime Chamber, which were both under- or misrepresented through skills levy contribution and WSP/ATR data. The taxi industry is furthermore underrepresented in terms of its sub-sectoral share, due to the informal nature of the industry. For this purpose, both electronic national administration traffic information system and consultations with industry representatives were consulted to validate and/or make deductions on official published data.

MODULE A: MULTI-CHAMBER ECONOMIC GROWTH & EMPLOYMENT FORECASTING

This step entailed developing growth forecasts and growth scenarios based on historic sectoral and employment growth. Through regression analysis, a relationship between economic and employment

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growth was established and projected into the future to determine the future labour demand in the sector, taking into consideration cyclical changes. This formed the basis for the further disaggregation of skills demand by Chamber and occupation.

The results gained from Module A give the TOTAL NUMBER OF ADDITIONAL JOBS (Net Demand) that will be created throughout the TETA landscape

MODULE B: RELATIVE OCCUPATION RATIOS (APPLICATION)

In order to disaggregate the demand for key skills and occupations throughout the TETA landscape, the labour demand figures (total number of additional jobs) derived from Module A were proportionally allocated to occupations relevant to the individual Chambers. ATR/WSP data, which record the occupations in which training activities took place, and inputs from the TETA Career guides and HTFV data for key priority occupations were used to inform this action.

The overall result gives the TOTAL PROJECTED LABOUR DEMAND BY CHAMBER AND OCCUPATION for TETA

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