Transport Planning in Municipalities in South Africa

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Acronyms

BRT	Bus Rapid Transport
CITP	Comprehensive Integrated Transport Plan
CODATU	Cooperation for urban mobility in the developing world
CPD	Continuous Professional Development
EIA	Environmental Impact Assessment
ETA	eThekwini Transport Authority
GIS	Geographic Information System
HEI	Higher Education Institutions
IDP	Integrated Development Plan
ITE	Institute of Transportation Engineers
ITP	Integrated Transport Plan
ITPN	Integrated Transport Plan Network
LGSETA	Local Government Sector Education and Training Authority
MEC	Member of the Executive Council
MoU	Memorandum of Understanding
NATMAP	National Transport Master Plan
NDoT	National Department of Transport
NDP	National Development Plan
NLTA	National Land Transport Act (Act No. 5 of 2009)
NLTSF	National Land Transport Strategy Framework
NMBM	Nelson Mandela Bay Municipality
OSD	Occupation Specific Dispensation
PDoT	Provincial Department of Transport
PIA	Planning Institute of Australia
PLTF	Provincial Land Transport Framework
SALGA	South African Local Government Association
SAPI	South African Planning Institute
SACPLAN	South African Council of Planners
SAQA	South African Quality Authority
SDP	Skills Development Providers
SSP	Sector Skills Plan
TCT	City of Cape Town's Transport Authority
TDA	Transport and Urban Development Authority
TDI	Transport Development Index
TNA	Training Needs Assessment
UCT	University of Cape Town
UJ	University of Johannesburg
UK	United Kingdom
UP	University of Pretoria
USA	United States of America
WSP	Work Skills Programme

Executive Summary

That Transport is a vital element for economic growth has been recognised by the development community. The United Nations has affirmed transport as an enabler of economic development through its inclusion in the Sustainable Development Goals. There are five targets that relate directly to transport. For example, Target 11.2 proclaims that

> *"By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older person"*.

The South African Government has acknowledged the importance of a collective and integrated transport system for economic development. The National Development Plan emphasizes the need for dependable, safe and economical modes of transport to realise the country's socio-economic objectives. The attainment of transport's goal is dependent on effective and efficient transport planning.

Transport planning in South Africa occurs in all three spheres of government each of which has distinct roles and responsibilities in terms of prescribed policies and legislation. Municipalities are at the coalface of service delivery and are increasingly being foisted with additional responsibilities, particularly the delivery of transport services. However, municipalities often lack the capacity and capability to undertake this function.

The LGSETA commissioned the WITS School of Governance to investigate the ability of municipalities to conduct transport planning with a specific emphasis on the skills, or the lack thereof, to undertake transport planning. A sample of 18 municipalities (8 metros and 10 secondary cities), 9 provincial departments, 2 universities, the South African Planning Institute as well as the South African Council of Planners were contacted and engaged with as part of this research.

Interactions with various stakeholders revealed widespread agreement that transport planning traverses numerous disciplines (e.g. engineering, town planning, and economics). Transport planners need to have a minimum understanding of the other disciplines as well as collaborating with these professionals for the attainment of transport imperatives. There is no accredited professional body that transport planners have to be registered or affiliated with to practise as a transport planner. Professionals practising within this domain not only emanate from engineering and town planning, but also from other disciplines such as business administration, economics, and geography. However, this trend is not out of line with international practice. A detailed analysis of UK universities shows, for instance, that town planners increasingly come from a much more diverse academic background than two

or three decades ago engineering was virtually the sole discipline from which transport planners emerged.

It is notable that transport planning in South Africa is only offered at the post-graduate level, with relatively high entry requirements (e.g. mathematics and science). Again, this appears to be in line with international practice whereby universities absorb graduates from varying academic backgrounds into Masters or Post-graduate diploma programmes.

A SAQA accredited undergraduate transport planning degree was formulated in South Africa but not implemented by universities. Their reluctance was embedded in the notion that there would not be sufficient demand, particularly in the private sector for transport planners.

However, there is evidence of an acute shortage of transport planning skills in the public sector. Several secondary cities (e.g. Drakenstein, Stellenbosch, Rustenburg, and Stellenbosch) only have a single transport planner. The Newcastle municipality does not have any. Excluding Cape Town, the metros also have a dearth of transport planners. The Ekurhuleni municipality only has 2 transport planners. An analysis of the profile of total transport planners reveals that most (72%) are male. This is true also in the metros (72%), secondary cities (64%) and the provincial departments (67%).

However, a greater proportion of female transport planners (50%) have degrees in comparison to their male counterparts (40%). Furthermore, a larger percentage of female transport planners (40%) have post graduate qualifications in contrast to male transport planners where only 34% have post graduate qualifications.

The majority (74%) of transport planners in the public sector are African. A delineation of transport planners by race reveals that Africans constitute 55% of transport planners in secondary cities and 88% of transport planners in the provincial departments. The majority of African transport planners (52%) have a degree in contrast to White transport planners where most (75%) have a post graduate qualification. Only 23% of African transport planners have a post graduate qualification.

Irrespective of qualification or gender, the majority of transport planners (87%) in the public sector have more than 5 years' experience. Transport planning experience of more than 5 years was at 95% in the metros, 80% in the secondary cities and 82% in the provincial departments.

Despite the vast experience and the qualifications (which was not necessarily within the transport planning sphere) there was a lack of skills to undertake transport planning across government. An interrogation of the skills profile reveals that while there is an overall shortage of transport planning skills, there is a scarcity of skills in particular areas of transport planning such as traffic engineers (Mangaung, Ekurhuleni), data analysis and economic modelling (Johannesburg), project research project design and planning skills

(Limpopo Department of Transport), Geographic Information System (GIS) engineers (Northern Cape Department of Transport).

The lack of transport skills in government has prompted institutions to implement strategies to attract and retain transport planners. These include bursaries (e.g. Cape Town, Ekurhuleni) scholarships (e.g. Cape Town), Young Professional Programme (e.g. Polokwane), internships (e.g. Cape Town, Sol Plaatjie). Some municipalities (e.g. Drakenstein, Tshwane Stellenbosch and uMhlathuze) constrained by the lack of financial resources do not offer any inducements to attract and retain transport planning skills. Several institutions (Buffalo City, Cape Town, Ekurhuleni, Mangaung, Msundizi and Umhlathuze) foster learning in the dynamic transport planning space by encouraging their employees to attend conferences and seminars

Similarly, most organisations (69%) promote the transfer of learning within the institutions. Most (83%) provincial departments indicate that they promote the transfer of learning. Similarly, 80% of metros indicate that there was transfer of learning taking place in comparison to only 33% of secondary cities The transfer of learning takes the form of mentoring and coaching (Cape Town, Johannesburg, Tshwane, Msundizi , Gauteng, North West), workshops (North West, Northern Cape, Polokwane) as well as by consultants (Rustenburg) as conditions of contracting with the municipality.

Recommendations

The lack of transport planning skills and concomitant transport planners within government, especially within municipalities is multifactorial. The recommendations advanced here are aligned with the mandate and capacity of the LGSETA, and are aimed at addressing the challenges confronted by municipalities and provincial departments of transport

1. Any proposal to improve the situation needs to be inclusive of the inputs of the main role-players in the transport planning environment. A round-table forum and/or dedicated working group should be established to frequently engage on pertinent matters regarding transport planning within government. These should, inter alia. include the National Department of Transport, Provincial Departments of Transport, South African Council of Planners, selected municipalities (Metros, Districts, Local), LGSETA, South African Local Government Association and the relevant universities. This will enable stakeholders to collectively identify the common barriers undermining transport planning; and subsequently develop suitable strategies that are agreeable to all participants. This will prevent unintended and unnecessary replication of initiatives and a concomitant waste of resources.
2. The LGSETA should endeavour to assist district municipalities and local municipalities to strengthen capacity in those municipalities that already have some capacity in transport planning. Consequently, these municipalities can assist other municipalities with their transport planning.

3. The LGSETA should enter into formal arrangements with the Provincial Departments of Transport to augment and enhance their capacity to support local municipalities with transport planning.
4. The LGSETA should engage with the National Department of Transport to fund one or more **Chairs in Transport Planning** in one or two universities (UCT and Stellenbosch appear to be ideal candidates) to deliver a Master's degree or Post-Graduate diploma in transport planning that is open to students from a wide range of academic backgrounds such as town and development planning, economics, geography, energy, environment, sociology and psychology. The greatest challenge in transport in South Africa is to change people's behaviour towards transport, in particular, public transport; hence the need for more graduates from planning and social science backgrounds, rather than engineering. We need to move away from the historical obsession in South Africa with transport planning being exclusively associated with an engineering degree.
5. The LGSETA in collaboration with the South African Local Government Association should fund research to investigate and identify areas of transport planning that need urgent attention.
6. The LGSETA could offer funding (through scholarships, bursaries, learnerships) in terms of its mandate to develop capacity within local government.
7. The LGSETA should provide incentives (e.g. monetary) for current transport planners to provide the transfer of learning to junior staff.
8. The LGSETA can engage with national government to make available the Occupation Specific Dispensation for transport planners by deeming it a scarce and critical skill.
9. The LGSETA should formalise relationships with the relevant transport authorities (City of Cape Town Transport and Urban Development Authority) to transfer knowledge to jurisdictions where it is lacking.
10. There is an urgent need to fund professional development courses in areas such as economic modelling; undertaking travel surveys; changing commuter behaviour; transport economics; and transport and the environment.

1. Introduction

The importance of transportation for economic growth and development is often overlooked. Access to transportation underpins the development of an area's economic health and quality of life. Transport planning is exceedingly critical in the development of cities, fostering economic activities, promoting community interaction, and augmenting the quality of life. It is also vital for sustainable development and ensuring safe accessibility of individuals including vulnerable groups (e.g. disabled) (The Economic Times, 2017).

An appropriately designed and efficient transport network is the bedrock of economic prosperity and has far-reaching effects on society and the natural environment, and can be the catalyst for the transformation of communities (WSP Parsons BrinckerHoff, 2017). Poor and inappropriate transport planning, especially in urban cities spawn severe congestion to the detriment of motorists, pedestrians and urban dwellers. These include the ignoring of traffic laws, ambulances being blocked, pedestrians killed and numerous multi car pile-ups (Clarkson, 2014).

Government has realised the importance of collaborative and integrated transport planning and has initiated the National Transport Master Plan (NATMAP) 2050; whose primary objective is to develop a multi-modal transport planning framework which is dynamic, long-term and aligned with the National Development Plan (NDP) (NDoT, 2015). Accordingly, the NDP points out that South Africa needs reliable, economical and smooth-flowing corridors linking its various modes of transport (road, rail, air, sea ports and pipelines (NDoT, 2015).

In South Africa, transport planning occurs in all three spheres of government. Each tier has distinctive roles and responsibilities, but they also have interdependent functions. A lack of understanding and appreciation of comprehensive transport planning, especially at the local government level, has resulted in poor planning and the waste of resources. This is exacerbated by the lack of skills and capacity in municipalities to undertake this critical task. Some municipalities do not commit adequate resources (human and financial) to foster transport planning. Nor do they set aside resources to raise their skills and knowledge within this domain. This has resulted in a dearth of transport planning skills among the workforce in the country with the situation more acute in the local and district municipalities.

South Africa's local government workforce plays a key role in service delivery. Hence, the importance of having skilled and capable workers cannot be overemphasised; as it not only improves the lives of South Africans, but also assists local government structures in meeting their Constitutional mandate (LGSETA, 2017). As part of its mandate to improve skills within the local government sphere, the Local Government Sector Education and Training Authority (LGSETA) has recognised the need to undertake objective research to inform its policy and strategies to improve the transport planning skills base.

The LGSETA provides an environment to facilitate the training and up-skilling of various employees and people involved in local government structures, as well as unemployed South Africans. This entails creating and implementing a variety of skills development interventions such as the Sector Skills Plan (SSP) and learning programmes aimed at local government employees and others working within the sphere such as traditional leaders and ward councillors.

This project was commissioned to investigate the ability of local government to carry out transport planning, with a specific emphasis on the skills base to optimally undertake this critical function. However, the transport planning discipline is wide and varied and is not confined to the movement of people on public road. Hence, the report commences by endeavouring to understand the concept of transport planning. Subsequently, the report deliberates on the educational requirements necessary to become a transport planner in South Africa and selected countries.

This is followed by a deliberation of roles and functions of the different spheres of government with regards to transport planning in South Africa. The next section emphasises transport planning within South Africa with a particular emphasis on municipalities. The following section discusses the methodology and the field work that was undertaken. The preliminary findings are successively scrutinised. The research ends with the conclusion and attendant recommendations that are required to improve transport planning within South Africa.

2. What do we mean by 'transportation planning'?

There is no universal and unique definition of transport planning. Some authors limit the definition to the provision of public transport within the local sphere. That is, transport planning focuses on the public provision and financing of transportation assets, especially roads and public transit systems. It endeavours to solve particular problems or transport concerns at a local level and has been traditionally a focus of lower spheres of government (Slack, 2017).

Other authors emphasise the processes undertaken and stakeholders necessary to expedite the movement of people and goods. Transportation planning is simply considered as preparation planning for the movement/transfer of humans and animals to other places and is most often related to the operation of the highway system, geometry and operation of traffic facilities (Ramadhan, 2017). Transportation in this paradigm is also seen as a cooperative process designed to foster involvement by all users of the system, such as the business community, community groups, environmental organizations, the traveling public, freight operators, and the general public (U.S. Department of Transportation, 2017).

Accordingly, transport planning consists of several steps. These include:

- Monitoring existing conditions;
- Forecasting future population and employment growth, including assessing projected land;
- Identifying current and projected future transportation problems and needs and analysing, through detailed planning studies, various transportation improvement strategies to address those needs;
- Developing long-range plans and short-range programs of alternative capital improvement and operational strategies for moving people and goods;
- Estimating the impact of recommended future improvements to the transportation system on environmental features, including air quality; and
- Developing a financial plan for securing sufficient revenues to cover the costs of implementing strategies (U.S. Department of Transportation, 2017).

A consultative and cooperative view is also emphasised by other organisations. The Institute of Transportation Engineers (ITE) defines transport planning as a collaborative and participatory process involving agencies, organizations and the public in a comprehensive look at national, provincial, regional and local needs (ITE, 2017).

Transport planning is more comprehensive than building roads to reduce congestion. Transport planners need to plan for the various modes of transport which carry people and goods from one place to another. Land transport, water transport, air transport and pipeline transport are the primary means of transportation. Transport planning entails holistically evaluating the overall transport needs and selecting the optimal mode of transport chosen according to necessity, the nature of goods, cost, time for transportation, reliability, capacity, access, and security (Business Marketing, 2017).

Land transport can be delineated into road and railway transport. Road transport is most often thought of as motorised transport such as cars, buses, trucks, and tractors that transport people and goods. In some parts of the country, people use non-motorised transport such as bicycles, wheel barrows and animals to transport goods and people. Rail transport is also utilised to transport people and freight, for both long and short distances. Although freight transport has largely migrated to road transport, it is still relevant in South Africa for transporting minerals (iron, steel, and coal), food (grain) and large machine (which are used in mines).

Water transport involves the movement of people and goods not only from one continent to another but also transporting goods and people from one place (country, city, region) to another by ship, boat, steamer, and motorboat through canals, rivers, lakes, sea, and ocean. Sea transport is ideally suitable for the transportation of crude oil, large machinery, vehicles as well as minerals (iron, steel, coal) (Business Marketing, 2017).

Air transport was initially confined to the transportation of people, mail and perishable goods from one destination to another, but has now expanded to include flowers, perishable foods, technical goods, emergency parts and parcels, equipment, and other valuable goods (foreign exchange and jewellery (Business Marketing, 2017).

Pipeline transportation allows for the movement of crude oil, petroleum products, processed coal, and drinking water, natural gas to be transported from one place to another either above surface or below or even under water. It is quicker and more reliable, needs fewer human resources and can be operated 24 hours; but requires huge initial investment (high "sunk-in" costs) and is limited to the transports of only liquid (Business Marketing, 2017).

Transport planners are therefore confronted by several dimensions and characteristics that need to be considered when embarking on multimodal planning for a specific region/city. That is, each transportation modality has unique advantages and properties that need to be considered when formulating an integrated transportation plan. The different modes can compete, complement and even overlap one another in terms of price, rapidity, convenience, regularity, security, and comfort (Rodrigue, et al., 2017).

Accordingly, transport planners need to consider three conditions to ensure harmonisation between the various modes of transport. These are:

- Geographical markets – The different modes of transport often require an interconnection (gateway) to ensure continuity, especially if different scales are involved such as between national and international transportation.
- Transport markets - The level of complementarity is influenced by the element (people or freight) that is being transported. For instance, in some markets rail and road transportation can complement each other by focusing on passengers with others concentrating on freight.
- Levels of service - Two modes that offer a different level of service will tend to complement each other for a similar market and accessibility. The most prevailing complementarity relate to costs versus time (Rodrigue, et al., 2017).

There are numerous factors that need to be considered when conducting transport planning and these require knowledge and skills across various disciplines. Hence, transportation planning is not confined to a single discipline and involves a collaborative effort of numerous professionals. Transport planning is a multidimensional practice that incorporates a wide range of professions which are involved with:

- The identification of desirable transport outcomes and accessibility needs;
- The planning for and delivery of different transport modes (including infrastructure and services);
- The integration of transport planning with other community plans, services and initiatives

- Accommodating private and public interests; and
- Considering national, state, regional and local transport needs (Planning Institute Australia [PIA], 2017).

It is therefore not surprising that most practising transport planners in South Africa are trained in other disciplines (e.g. engineering); and have to collaborate with their counterparts in other professions to optimize transport planning within their various spheres of government. Moreover, transport planning cannot be undertaken in isolation within one sphere or city; but needs to be linked and co-ordinated with provincial and national transport policies and strategies.

3. Education and training of transport planners: A review of South African and international higher education institutions

It is recognised that transport planning is a multidisciplinary endeavour encompassing various professions to realise transport planning objectives. However, there are a set of core skills and competencies which are required of all transport planners. The attainment of the necessary competencies to practise as a transport planner can only be obtained at tertiary institutions. This section explores the institutions where one can obtain the concomitant qualifications and the pre-requisites thereof to work as a transport planner. The information is tabulated to allow for comparison between the different offerings of the identified institutions. The section subsequently explores the education and training requirements for transport planner in selected industrialised and developing countries.

3.1. South Africa

In South Africa, analysis of transport planning is demarcated between the structured degrees and skills programmes.

3.1.1. Transport planning education in South Africa

Transport planning in South Africa is offered mainly at the post-graduate level and to some extent, at the undergraduate level, in several universities as shown in Table 1.

Most Masters degrees in transport planning in South Africa are aimed at training transport planners in an interdisciplinary fashion. The University of Cape Town's Master of Transport Studies has a cross-disciplinary focus aimed at exposing students to a wide range of issues relating to management, planning, and evaluative skills. Similarly, the University of the Witwatersrand's Master of Science in Development Planning has an interdisciplinary focus aimed at equipping graduates with skills to address the multiple issues involved in development planning. Both these degrees enable graduates to register with the South African Council for Planners (SACPLAN). The University of the Witwatersrand's Postgraduate Diploma, on the other hand, provides those who do not have a planning

background with an opportunity to enter the field, and allows graduates to enter the Master of Science in Development Planning, upon completion of the diploma. The University of Johannesburg's National Diploma in Town and Regional Planning is equally diverse and includes land use planning, urban design, transport and infrastructure planning, use and extension of information technology, heritage and conservation, resource management, environmental monitoring, commercial and industrial development, policy making and implementation, planning law and practice. The University of KwaZulu-Natal's Master in Town and Regional Planning Programme focuses on training town and regional planners aimed at town planning as well as planning of human settlements.

Table 1: Transport planning offerings at South African universities

Institution	Degree, diploma	Prerequisites
University of Cape Town	Master of Transport Studies	
	Master of engineering specialising in transport studies	
	Master of philosophy specialising in transport studies	
University of the Witwatersrand	B.Sc Urban and regional planning	
	Postgraduate Diploma in Planning	A recognised undergraduate degree in a cognate field (e.g. geography, architecture, engineering, sociology, anthropology, economics, politics, and property studies) A B.Tech in Urban and Regional Planning Literacy in mathematics and academic writing proficiency
	Master of Science in Development Planning	A Bachelor of Science Honours in City/Town/Urban and Regional Planning (BSc Hons URP) with an average of at least 60%; or The Postgraduate Diploma in Planning (PG Dip) with an average of at least 60%.
	Master of Science in Town and Regional Planning	A Bachelor of Science with Honours from Wits or another university or a 4 year Bachelor of Engineering Science
Stellenbosch University	Transport Economics (BCom)	
	BCom (Hons) Transport Economics	
	MCom Transport Economics	BCom (Hons) Transport Economics
University of Johannesburg	Diploma in Transport Management	Grade 12 with diploma endorsement
	Diploma in road transport management	Grade 12 with diploma endorsement
	BTech Civil Engineering	
	National Diploma Town and Regional Planning	Senior Certificate
	BCom (Hons) transport	BCom in Transport Economics/ Btech in

Institution	Degree, diploma	Prerequisites
	Economics	Transport Economics
University of South Africa	BCom in Transport Economics	
University of KwaZulu-Natal	Master in Town and Regional Planning Programme (MTRP)	Students with a good first degree or an Honours Degree in a relevant/cognate discipline are eligible to apply for entry into one of these post-graduate programmes. Graduates with a good Honours Degree in a closely related discipline can apply to undertake a Masters by Research in one year of full-time study.
Nelson Mandela Metropolitan University	Btech (Engineering: Civil Specialising in Transportation Engineering)	Students must have a 65% average for the National Diploma: Engineering: Civil.

Several institutions offer transport planning courses (e.g. traffic engineering) at an under-graduate level. But these do not allow one to 'practise' as a transport planner. The individual has to possess a post-graduate degree (Honours or Masters) in transport planning to be 'recognised' as a transport planner.

It may be feasible to derive a stand-alone transport planning undergraduate course with an attendant curriculum. However, deliberations with the university practitioners within the field indicated that while it is theoretically possible, it was not feasible for a variety of reasons. Firstly, a graduate from the engineering stream needs have a diverse set of skills once h/she graduates to work in various subsectors within civil engineering and not be restricted to transportation. These could involve architectural engineering, water resources engineering and environmental engineering. A transport planner graduate will be constrained if s/he wants to move into another field within civil engineering.

Secondly, an engineer or transport planner needs a set of core as well as complementary subjects before they can do transport planning. For instance, the students will have to enrol for science related subjects such as mathematics, physical science, and geography which underpin all transport planning. The core modules (e.g. transport engineering) regarding transport planning can only be done in the final years of study once these compulsory courses have been completed. Subsequent specialisation can only be done at a post-graduate level.

Thirdly, while there is a seemingly high demand for transport planners in the government sphere, particularly local government, there may not be such a large demand for such skills within the private sector. The industry works in close collaboration with the universities in the design and formulation of the curriculum so it is relevant and meets the demand of the sector. Graduates who do not wish to work in the public sector may have limited choices

once they graduate as the demand for transport planners in the private sector is not high at the present time.

Fourthly, there could be a high demand (as this study shows) for transport planners, but the incumbent transport planners restrict entry into the profession by stipulating mandatory requirements such as a post graduate qualifications (barriers to entry).

It is noteworthy, that more than a decade ago the senior staff at the University of Cape Town designed an undergraduate course (South African Quality Authority [SAQA] approved) for transport planners at the behest of the National Department of Transport (NDoT). However, the universities were not keen to rollout the programme as there was concern that there would not be sufficient demand to justify the budgetary commitments for such a course. This option needs further consideration in the long term to increase the number of transport planners within South Africa, particularly the public sector. This has been acknowledged by both public sector authorities and academics resulting in institutions offering accredited short courses in transport planning to boost capabilities within this environment.

3.1.2. Skills programmes for transport planning

Most South African universities offer short courses for officials in selected areas of transport planning. These are designed to build and strengthen capacity in identified areas (e.g. new technology). These can be done through formalised Continuous Professional Development (CPD) [University of Cape Town] or through non-examinations courses (University of Stellenbosch) as seen in Table 2.

The University of Cape Town's Programme in Transport Studies awards students with a certificate of attendance. This course is aimed at transport planning practitioners and focuses on creating a safe, affordable and efficient transport system. The University of South Africa's Programme in Road Management, on the other hand, is aimed mainly at those in the private sector working in road transport. This programme has a specific focus on freight transport, although it also focuses on other facets of transport management in the private realm.

Table 2: Skills programmes for transport planning

Institution	Skill Programme	Prerequisites
University of Cape Town	Continuous Professional Development (CPD) Programme in Transport Studies	The programme has been designed to be accessible to people in full-time employment as well as full-time students. Applicants may register for the individual Master level courses offered by the programme as Continuing Professional Development students. These students will be awarded a Certificate of Attendance. University credits will not be awarded to these students. Courses are typically attended by consultants or government officials working within the transportation field.
University of Johannesburg	Transport Management Diploma	Grade 12 or Equivalent
University of South Africa	Programme in Road Transport Management	Senior Certificate or an equivalent NQF level 4 qualification and numerical skills on the NQF level 3.
University of Stellenbosch	E.g. Traffic Engineering Applications: Active Traffic Management, Transport Modelling, BRT	Senior Certificate or an equivalent NQF level 4 qualification and numerical skills on the NQF level 3.-

Often these courses (e.g. BRT) are targeted at municipal officials who do not have a transport planning background but are working in this field. The courses are not intended to create transport planners, but rather to enhance their skills sets in this domain.

The courses are developed by the universities after undertaking a needs assessment and subsequently offered to the municipalities.

3.2. Industrialised countries: United Kingdom (UK), United States of America (USA), France, Germany, Norway, Sweden, Finland, Canada, Singapore and Japan

In most industrialised countries, an interdisciplinary approach is taken by educational institutions in training their transport planners. Given that in most of these countries the transport systems are highly developed and advanced, their focus is largely on the improvement and maintenance of these systems. Many programmes have a strong focus on the social and economic development of the country, specifically on building sustainable transport systems to create a conducive environment for social and economic development. For example, the MSc in Transport Planning and Engineering offered by New York University provides students with skills in vehicle deployment, congestion management, city logistics, disaster management, as well as other areas. Interestingly, this programme also provides students with the opportunity to take courses in other disciplines such as econometrics, computational statistics and urban informatics. Students on this programme are also encouraged to undertake entrepreneurial pursuits while on the programme, with several incubators, available to help them with the innovative ideas they come up with. Many

sustainable transport solutions have stemmed from these initiatives, thus creating a mutually beneficial environment for innovative solutions in entrepreneurship.

Similarly, the Master of City Planning at Berkeley has an additional focus on analytical and communication skills, as well as emphasising the history and theory of cities and urban regions. Students have the opportunity to specialise in four areas, allowing them to further deepen their knowledge in that particular space. These are Environmental planning and healthy cities; Housing, community, and economic development; Transport policy and planning; and Urban design.

The Masters programme in Urban Planning and Mobility at Berlin University focuses on the interaction between mobility, transport and the built environment as well as the role of integrated transport and land use planning. Combining elements from both spatial planning and transport planning, it provides a blend of theoretical, practical and methodical competences mixed with first-hand case study experience.

Another distinguishing feature of programmes offered in these countries is that they have a strong practical component, providing the prospective transport planners with the ability to deal with the real-world challenges which a transport planner may face. This is the focus for example, of the Masters in Sustainable Urban Planning at the Blekinge Institute of Technology in Sweden, where students are given various projects and assignments to which they are required to apply their theoretical knowledge. This programme does have a strong focus on the history and future of the Swedish transport system, although it does manage to cater for international students as well. Similarly, McGill's Transportation Planning within the M.U.P. degree in Canada includes an internship, and a final research project to prepare students for professional practice in urban transportation planning. Students are also given the opportunity to engage with subjects in other disciplines, such as Engineering.

The Masters Programme in Spatial Planning and Transportation Engineering at Aalto University in Finland, has a strong focus on the environmental sustainability of cities and aims at providing students with competencies to work for smarter and more liveable cities and to respond to emerging issues of constantly changing built environments and technologies.

The Masters in Urban and Regional Development at Kyoto University and Special Masters Graduate Study Program of International Development Engineering at the Yokohama National University in Japan, on the other hand, have a strong engineering inclination, although they also strive to incorporate the social sciences into their programmes. The programme at Kyoto focuses on social analysis technology utilising urban engineering, traffic engineering, and environmental system engineering to analyse human activities in cities. Similarly, at Yokohama National University emphasis is placed on the following areas:

Structural Engineering, Estuarine and Coastal Engineering, Geotechnical Engineering, Transportation and Urban Engineering, and Concrete Engineering.

United Kingdom

UK universities provide a range of Masters courses of relevance – many of which are approved for the Transport Planning Professional qualification.

Transport planning is about preparing, assessing and implementing polices, plans and projects to improve and manage our transport systems. There is a need for transport planning on a local, regional, national and international level. It can involve understanding the link between transport and the future shape of our towns and cities, the economy, the environment and climate change, and the quality of life. It is also about changing people's attitudes towards travel to encourage use of alternatives to the private car.

Transport planning involves a wide range of disciplines and covers everything necessary to tackle the nation's transport problems and to plan and deliver our transport systems. The wide range of work is one of the big attractions. In fact, the work of transport planners touches almost every aspect of our day-to-day lives.

Transport planners work in the public and private sectors, as well as the academic, research, public interest and voluntary sectors. Most of those in the public sector work for local authorities – others work for government departments and agencies. Most private sector jobs are with consultants, and some are with train and bus and coach operators and with developers and financing companies with transport interests.

Transport planners have many career options, some choose to become experts in a particular aspect of transport planning – for example in transport modelling, sustainable transport, travel planning, while others prefer to work across a wide range of transport planning activities, achieving breadth as well as depth of competence.

In several transport planning degrees, there are strong links to other disciplines: for example, geography (University of Oxford, University of Salford); town and development planning (University of Westminster, University College, London); Sociology (Universities of Lancaster, Leeds, Napier); engineering (Imperial College, University College, Leeds University).

Table 3: Transport planning education in the United Kingdom

Institution	Skill Programme	Prerequisites
University College London (joint programme with Imperial College, London)	MSc in Transport and City Planning MSc Transport with Business Management MSc in Transport with Business Management	Transport planning or engineering graduates or specialists interested in the design of sustainable cities, planning or geography graduates wishing to specialise in transport planning, who want broad knowledge in transport, planning and the delivery of the sustainable city.
Cardiff University	MSc Transport and Planning	Applicants should normally hold a first or second class Honours degree in an appropriate subject. This MSc is suitable for graduates in geography, planning, transport, engineering, science and social science
Institute for Transport Studies, University of Leeds	MSc Transport Planning MSc Mathematical Modelling for Transport MSc Transport Economics MSc Transport Planning and the Environment	A bachelor degree with a 2:1 (hons) in a relevant subject such as geography, town planning, earth and environment, architecture, sustainability.
University of Salford	MSc Transport Engineering and Planning	A minimum 2:2 honours degree in an appropriate discipline, or equivalent. A wide variety of first degrees are accepted, including engineering, science, geography and social science.
Edinburgh Napier University	Transport Planning and Engineering, M.Sc.	The entry requirement for this course is a Bachelor (Honours) Degree at a 2:2 or above. We look for applicants to have a background in Civil Engineering, Social Sciences, Geography, or Maths in order to be eligible for the programme.
Centre for Transport and Society, University of the West of England, Bristol	M.Sc. Transport Planning; M.Sc. Transport Engineering and Planning	Both Masters programmes offer an emphasis on the social context in which transport operates, with the programme in transport engineering and planning offering skills in infrastructure design and management. Unique multi-disciplinary approach to transport planning.
Transport Studies Unit, University of Oxford	Short courses: Global Challenges in Transport programme	Courses in 2017: New technologies and changing behaviours; Governing transitions in urban transport; infrastructure, development and finance; health, well-being and urban mobility

3.2.2 United States of America

Table 3: Transport planning educational requirements in the United States of America

Institution	Degree, diploma	Prerequisites
New York University	MSc Transport Planning and Engineering	Applicants to the MS program are expected to have an undergraduate degree in an engineering or related discipline, with a basic level of knowledge of probability and statistics.
Berkeley	Concurrent Master of City Planning/ Master of Science	The program welcomes applicants with undergraduate degrees in any scientific or engineering discipline.
Harvard Kennedy School	Transportation Policy and Planning	This course is open to any HKS or GSD student who has taken an introductory graduate level course in applied microeconomics or who has done well in the MPA summer introduction to economics. Students can take this course and microeconomics concurrently but if so they should be sure their schedule permits them to attend the Friday review sessions.

3.2.3 France

Table 4: Transport planning educational requirements in France

Institution	Degree, diploma	Prerequisites
Sciences Po	Master in Urban Policy	Applicants are selected on the strength of their applications only. The final admissions decision is made by a jury with members from both universities.
École Des Ponts ENPC	Specialised Master in Integrated Urban Systems (IUS)	
School of Bridges ENPC	Specialised Maters degree in Railway and Urban Transport Systems	

3.2.4 Germany

Table 5: Transport planning educational requirements in Germany

Institution	Degree, diploma	Prerequisites
Technische Universitat Dresden	Bachelor of Transport Economics	General qualification for university entrance
RWTHaachen University	BSc Mobility and Transport	
Technische Universität München	Master of Science in Transportation Systems	Application is open to candidates with a relevant Bachelor's degree or European/German FH Diploma in the area(s)

		of Civil Engineering, Transportation Engineering, Electrical Engineering, Geodesy, Mechanical Engineering, Geography, Computer Sciences, Communications Engineering, Economics, Mathematics, Physics, Architecture, Environmental Engineering, or other applicable degrees. However, an academic background in Engineering and Transportation Science is a prerequisite for this programme.
Technical University Berlin	BSc Transportation in general	
Berlin University of Technology	Master of Urban Planning and Mobility	Bachelor's degree in the field of Urban and Regional Planning or Transport Planning with a duration of at least three years or any comparable degree accepted by the examination board (simultaneous acceptance for the Master's programme in Urban and Regional Planning at TU Berlin is required)

3.2.5 Sweden

Table 6: Transport planning educational requirements in Sweden

Institution	Degree, diploma	Prerequisites
Blekinge Institute of Technology	Master Programme in Sustainable Urban Planning	To meet the entry requirements for master's level (second cycle or graduate) studies, you must have been awarded a Bachelor's degree (equivalent to a Swedish Kandidatexamen) from an internationally recognised university.

3.2.6 Finland

Table 7: Transport planning educational requirements in Finland

Institution	Degree, diploma	Prerequisites
Aalto University	Master's Programme in Spatial Planning and Transportation Engineering	An appropriate Bachelor's degree or an equivalent qualification.

3.2.7 Canada

Table 8: Transport planning educational requirements in Canada

Institution	Degree, diploma	Prerequisites
McGill	Transportation Planning within the M.U.P. degree	Criteria for selection include students' performance so far in the program, in particular in transportation-related courses, their level of skill in transportation-related research methods, and the quality of their letter of

		application for admission into the concentration.

3.2.8 Singapore

Table 9: Transport planning educational requirements in Singapore

Institution	Degree, diploma	Prerequisites
Technische Universität München	Master of Science in Transport and Logistics	Applications are open to candidates who hold a relevant Bachelor's degree or its equivalent in any of the following areas (but not limited to these areas): Civil Engineering, General Engineering, Economics.

3.2.9 Japan

Table 10: Transport planning educational requirements in Japan

Institution	Degree, diploma	Prerequisites
Kyoto University	Masters in in Urban and Regional Development in the Department of Urban Management	
Yokohama National University	Special Masters Graduate Study Program of International Development Engineering	An applicant should normally possess a four-year bachelor's degree with the minimum grade above average (normally an equivalence of 3.1 on the 4-point scale

3.3 Middle income and developing countries: Argentina, China, India, Malaysia and Kenya

The transport planning programmes in middle income and developing countries tend to have a strong focus on the engineering discipline.

The Master's Program of Traffic and Transportation Engineering at Beijing Jiaotong University in China focuses on logistics engineering, control science and engineering, and traffic and transportation. Similarly, the Masters in Transportation Engineering offered at the Neihang University in China specialises in traffic information engineering and control, and transportation planning and management, although this programme is specifically designed to attract international students.

The Master of Planning with specialisation in transport planning offered by the School of Architecture and Planning in Delhi, India, focuses on issues related to the role of transport in development, identification and analysis of problems, issues and constraints in regional and urban development, development of mathematical models for transport demand projections, and traffic engineering and design, amongst others. The Master of Science Transportation Planning at Universiti Teknologi in Malaysia follows in a similar vein; however, special attention is paid to both urban and rural development in the transport planning context.

A country's programmes which has a similar disposition to the developed countries, with a multidisciplinary focus is the Master of Arts in Planning offered by the University of Nairobi, and is suitable for individuals in public, private, voluntary and international agencies working at local, sub-national, national and international levels.

3.3.1 Argentina

Table 11: Transport planning educational requirements in Argentina

Institution	Degree, diploma	Prerequisites
Universidad Nacional De Rosario	Higher Education Post-graduate Certificate in Architectural and Urban Equipment Design	

3.3.2 China

Table 12: Transport planning educational requirements in China

Institution	Degree, diploma	Prerequisites
Beihang University	Master's in Transportation Engineering	Applicants who have a bachelor of science degree and sufficient English levels are eligible.
Beijing Jiaotong University	Master's Program in Traffic and Transportation Engineering	
Shaghai Jiao Tong University	Master in Transport Planning and Management	An equivalent of China's bachelor degree education diploma.
Shanghai Maritime University	Master of Transport Planning and Management in English	Degree certificate, diploma or official proof of expected graduation (the diploma or certificate must be in Chinese or English with official school stamps or a notarized version in Chinese or English)

3.3.3 India

Table 13: Transport planning educational requirements in India

Institution	Degree, diploma	Prerequisites
School of Architecture and Planning, Delhi	Master of Planning with specialisations in Transport Planning	

3.3.4 Malaysia

Table 14: Transport planning educational requirements in Malaysia

Institution	Degree, diploma	Prerequisites
Universiti Teknologi Malaysia	Master of Science (Transportation Planning)	
Universiti Teknologi Malaysia	Ph.D. (Transportation Planning)	Master's Degree or its equivalent, acceptable by the university

3.3.5 Kenya

Table 15: Transport planning educational requirements in Kenya

Institution	Degree, diploma	Prerequisites
University of Nairobi	Master of Arts in Planning	A holder of a Bachelor's degree, of at least upper second class honours in planning, architecture, land economics, building economics, civil engineering, design, surveying, agriculture, law, economics, geography, sociology, government, anthropology, social work or any other relevant discipline from the University of Nairobi or any other recognised institution.
University of Nairobi	B.A (Urban & Regional Planning	A minimum of Grade C+ at the KCSE or bridging/Pre-University certificate examination in the following subject clusters English; chemistry or biology; geography; agriculture; building construction or drawing and design.

4. Transport Planning in South Africa

The government has realised the importance of an efficient and effective transport system as a foundation for economic growth and development.

> *"Transport is the heartbeat of South Africa's economic growth and social development"*

The development and maintenance of a modern and competitive transport system is an important objective of the National Development Plan (NDP) and the Medium Term Strategic Framework 2014-2019 (Government of South Africa, 2017).

The Constitution of the Republic of South Africa of 1996 (Act No.108 of 1996) prescribes the legislative responsibilities of the different spheres of government with regards to the provision of transport. Schedule 4A states that airports, other than international and national airports are concurrent functions between the national and provincial spheres of government. Schedule 4B specifies municipal airports as well a municipal public transport is solely a local government competency. Similarly, provincial roads and traffic, in terms of Schedule 5A of the Constitution, is an exclusive provincial competency (Presidency, 1996). Accordingly, legislation has been promulgated to demarcate the roles, responsibilities and functions of the different spheres of government with regards to transport planning in South Africa.

The NDoT is responsible for conducting sector research and formulating legislation and policies 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 (NDoT, 2015). Accordingly, the department's strategic goals are to, among other things, ensure an efficient and integrated infrastructure network that serves as a catalyst for social and economic development; ensure a safe and secure transport sector; improve rural access, infrastructure and mobility; improve public transport systems, and increase the contribution of the transport sector to job creation (Government of South Africa, 2017).

These objectives are realised through a multitude of enabling legislation such as the Road Transportation Act, 1977 (Act No.74 of 1977); Airports Company Act, 1993 (Act No. 44 of 1993) and Marine Traffic Act, 1981 (Act No. 2 of 1981). The implementation of these transport functions at the national sphere are mostly undertaken by public entities (e.g. Air Traffic and Navigation Services Company, Ports Regulator of South Africa, Road Traffic Management Corporation) which are overseen by NDoT (National Treasury, 2016)

The NDoT is also mainly responsible for co-ordinating the various spheres and provides guidelines through the National Land Transport Strategy Framework (NLTSF). This

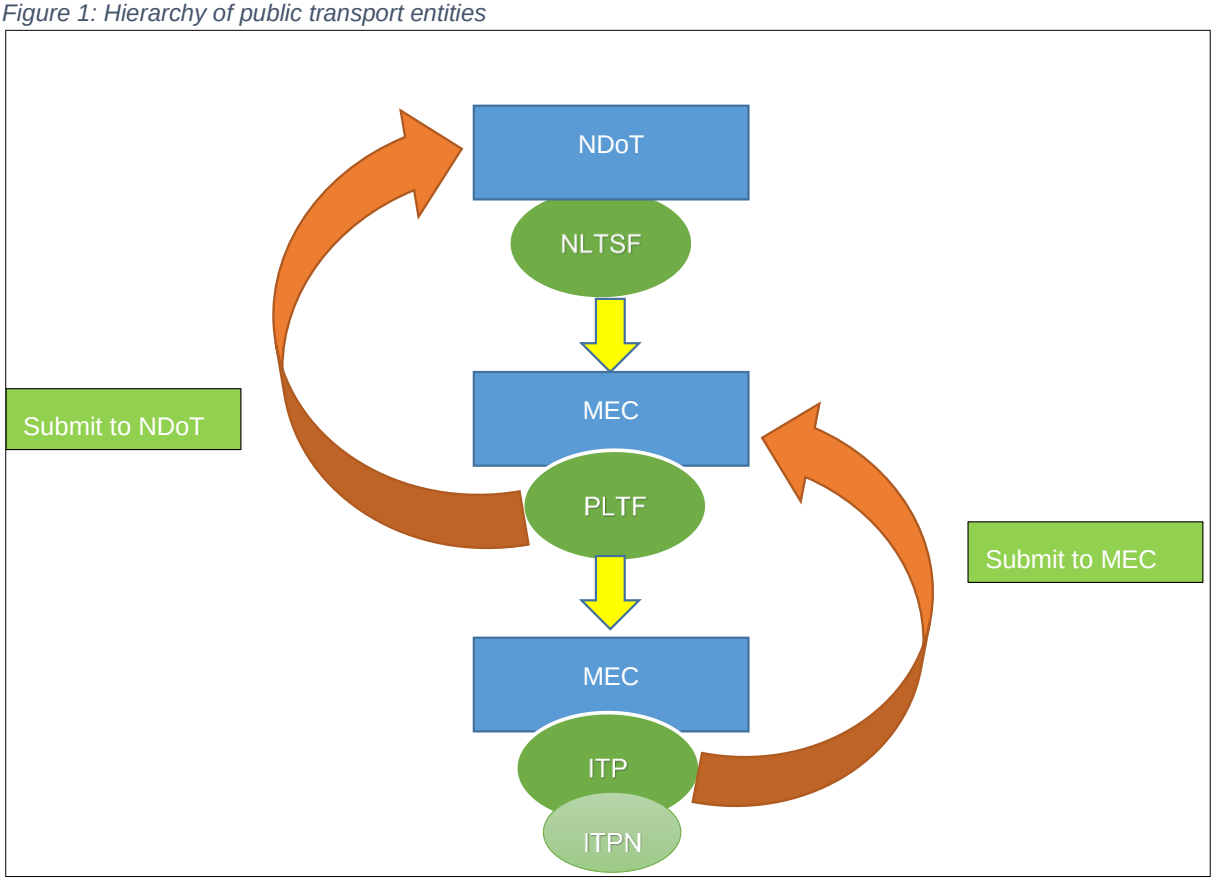
document contains the national transport strategies and directives that lower-sphere needs to adhere to.

The provincial transport (and planning) function is managed by a Member of the Executive Council (MEC). It must be noted that the transport function in provinces is often not exclusively assigned to a single department, but is amalgamated with other departments. The Free State has a Department of Police, Roads and Transport, Gauteng has a Department of Roads and Transport; in the Western Cape it is the Department of Transport and Public Works; whilst in the North West it is the Department of Community Safety and Transport Management with a separate department for Public Works and Roads.

Despite the various configurations, the respective departments are involved in transport planning, and closely involved in supporting municipalities within their boundaries with this function. Each province produces a Provincial Land Transport Framework (PLTF) which is designed to be linked with national and local policies. The role of the provinces with respect to the municipalities is more advisory (than regulatory) as well as supportive.

The municipalities are responsible for transport planning within their jurisdictions. They exert their influence through the Integrated Transport Plan (ITP) or Comprehensive Integrated Transport Plan (CITP) [Metros] and Integrated Transport Plan Network (ITPN) [those with Rapid Bus Transport System] (CODATU, 2017). The linkages and hierarchy of transport planning are illustrated in Figure 1.

Figure 1: Hierarchy of public transport entities



Source: (CODATU, 2017)

The National Land Transport Act (Act No. 5 of 2009) [NLTA] is the overarching legislation that governs transport planning across all spheres of government in South Africa and stipulates the institutional arrangement and responsibilities for transport planning at all spheres of government. In terms of Section 5(1), the Minister must monitor all provincial land transport policies and frameworks and all transport planning required or envisaged by this Act. In terms of Section 32 of the NLTA;

(a) A National Land Transport Strategic Framework (NLTSF) is prepared by the Minister;

(b) Provincial Land Transport Frameworks are prepared by the MECs; and

(c) Integrated transport plans are prepared by planning authorities

Given the lack of capacity in municipalities to undertake planning, the Act makes provision for the municipality to engage with other spheres of government for its planning needs. Section 33(1)(a) states that a planning authority may enter into an agreement with any other

planning authority or the provincial department to assist it in performing its functions. Accordingly, all provincial departments of transport[1] provide support to the municipalities.

In terms of Section 34 of the NLTA, Act the NLTSF guides transport planning in South Africa. Accordingly, the Provincial Land Transport Framework must provide a transport framework as an overall guide to transport planning within the province, being guided by NLTSF. Similarly, all planning authorities (which are usually the municipalities) must prepare and submit to the MEC integrated transport plans (ITPs) for their respective areas.

4.1. Transport planning in municipalities

There is recognition in government that there is a scarcity of planning competencies and skills, particularly at the local government level. Consequently, numerous strategies and interventions were initiated to assist municipalities bolster their capacity within this domain.

Municipalities receive *the Public Transport Network Grant* to promote accessible, reliable and affordable integrated municipal Public transport network services which is made available to 13 municipalities[2] (8 metropolitan municipalities and 5 secondary cities). The grants are given to these municipalities to improve their public transport systems for the development of integrated public transport network infrastructure, such as bus rapid transit systems, conventional bus services and upgrades for pedestrian and cycling infrastructure (National Treasury, 2016b).

Certain municipalities receive the *Infrastructure Skills Development Grant* to develop capacity within municipalities by creating a sustainable pool of young professionals with technical competencies related to municipal services, such as water, electricity and town planning. The grant places interns in municipalities where they can complete their requirements in terms of the relevant statutory council prescriptions within their respective built environment fields. Subsequently, the interns can be hired by any municipality at the end of their internship (National Treasury, 2016b). However, this initiative does not pertain to transport planning *per se*, although some interns from the town planning stream have been absorbed into transport planning divisions within certain municipalities (e.g. Sol Plaatjie).

It is notable that transport planning in municipalities is not exclusively undertaken by the municipalities themselves. They are often assisted by both provincial and national spheres of government. Moreover, district municipalities sometimes serve in a coordinating role to assist local municipalities.

[1] The ones that were visited as part of this study
[2] 12 secondary cities including George were selected for this project

5. Methodology

As part of its mandate to improve skills within the local government sphere, LGSETA has recognised the need to undertake objective research to inform its policy and strategies to improve local government skills base. Accordingly, the LGSETA has entered into a Memorandum of Understanding (MoU) with the WITS School of Governance to undertake research in identified areas. These primarily pertain to areas where there is a perceived shortage of critical skills and where the LGSETA can initiate strategies to remove obstacles and aid municipalities to realise their mandate and development imperatives. As part of this initiative, the LGSETA has commissioned the WITS School of Governance to conduct research on Transport Planning within the local government sphere, with a specific emphasis on the skills base, or lack of thereof to deliver services with the subsequent intention to build capacity within this arena.

A sample of municipalities was selected together with Provincial Departments of Transport, the National Department of Transport, and other important stakeholders (e.g. Universities, South African Council of Planners). A draft questionnaire (see Annexure A) was prepared to guide the deliberations and solicit relevant information pertaining to transport planning.

The researchers completed the fieldwork and delivered a draft report by 31 March 2016. This report focuses on the fieldwork (see Annexure B for the schedule of interviews) that was undertaken and highlights the important issues were raised by participants in the study. This report subsequently makes recommendations to improve transport planning within government.

5.1. Stakeholder engagements

The sample of stakeholders to be interviewed was pre-selected by the LGSETA. These included 18 municipalities (8 metropolitan municipalities and 10 secondary cities) in all provinces, 8 provincial departments of transport, the National Department of Transport, South African Planning Institute (SAPI), the South African Council of Planners (SACPLAN), University of South Africa Department of Transport and the University of Johannesburg.

During the engagements with several stakeholders (e.g. Stellenbosch Municipality, City of Johannesburg Municipality, City of Cape Town Municipality, Eastern Cape Provincial Department of Transport) it became evident it that would be necessary to engage with other academic institutions such as the University of Cape Town Centre of Transport Studies, University of Pretoria Centre for Transport Development and the University of Stellenbosch, Department of Transport and Civil Engineering.

It was intimated that these institutions have dedicated programmes and courses for transport planning and the lecturing staff and convenors of these programmes would provide valuable insight into the requisite skills and knowledge that is commensurate with transport planning.

Furthermore, the University of South Africa does not have a stand-alone transport planning division as it incorporates other disciplines such as general planning and urban transport. The University of Johannesburg's Department of Transport and Supply Chain Management did not respond to an invitation to participate in the research.

5.1.1. Unavailability and non-responses

The project commenced in early February with the fieldwork estimated to be completed by the beginning of March. It was expected that the ensuing analysis and draft report would have been completed and submitted to the LGSETA by the 15 March 2017. However, the anticipated fieldwork took much longer than expected. Several reasons can be advanced for the delay in the fieldwork. Firstly, certain Skills Development Facilitators (SDFs) who were nominated to assist and facilitate the engagements with the transport planners and planners were not available. Consequently, the researchers approached the institutions directly to obtain the required details of the relevant people and the make the necessary appointments.

Secondly, identifying the person responsible for transport planning in departments and municipalities could not always be easily done. Several municipalities/provincial departments do not have transport planners with the function often being delegated to other sections such as roads. Hence, respondents were not sure if they were the correct person to participate in the study or should it be someone else. Thirdly, some relevant respondents (Sol Plaatjie, North West Provincial Department of Transport) that agreed to meet were not available on the day of the meeting.

Fourthly, some entities just could not identify people (Mpumalanga Department of Transport; Mbombela, uMhlathuze) who were willing to participate in the research. Fifthly, some municipalities (eThekwini municipality) refused to participate in the project as they did not have time nor the inclination to be involved in the project. Sixthly, as alluded to above, new stakeholders (such as the University of Cape Town and University of Stellenbosch) were added to the list of participants. The field work extended until the last week of March.

Nonetheless, the respondents who participated have provided important insights into the challenges (and successes) surrounding transport planning at the local government level. This is the final report that is reflective of the analysis of the study.

6. Discussion and findings

While there is general consensus of what a transport planner actually does, there is no agreement on the minimum skills or qualification requirements that an individual should possess to be recognised as a transport planner. There is no accredited institution with which a transport planner is obliged to register to practise as a transport planner. Individuals practising within this domain have backgrounds in road transport planning (diploma), town planning (degree/diploma), and urban planning and most often a degree in engineering, particularly civil engineering. Transport planning (as one respondent averred) is a multi-disciplinary vocation encompassing town planning, urban planning, urban design engineering, transport economics and many other related disciplines such a roads transport and traffic management. A transport planner often has one of more of these skill sets.

Most respondents indicated that there was no dedicated undergraduate transport planning qualification. Transport planning was often taught as a module as part of some other qualification such as engineering, town planning and urban planning. In terms of SACPLAN guidelines, transportation planning is a specialisation that is delivered at Honours or Masters level comprising a practical component, whereas the undergraduate course is primarily theoretical (South African Council for Planners [SACPLAN], 2014).

It would appear that officially, a transport planner should have post graduate degree/diploma accompanied by some undergraduate degree in planning such as in town planning or engineering. Often many planners (e.g. North West Provincial Department of Transport – Diploma Road Transport Management, Free State Provincial Department of Transport – Bachelor in Administration) have no formal training within the discipline. Others have part of the qualification such as town planning (Sol Plaatjie Municipality) or Civil Engineering (Drakenstein Municipality); and there are a few that have the correct qualification (City of Cape Town, Polokwane). The skills profile of transport planners is shown in Table 16.

Table 16: Skill profile of transport planners

	Skills profile
Metro	
Buffalo City	• Civil engineers • B Tech graduates
Cape Town	• Spatial planners • Environmental Impact Assessment (EIA), Engineers • System planning modelling • Town planners.
Ekurhuleni	• Traffic engineering • Civil engineering • Town planning • Intelligent transport systems. • Legislation
eThekwini	• Civil Engineering
Johannesburg	• Civil engineers • Transport economists
Nelson Mandela Bay	• Civil Engineering • Transportation Engineering (3 planners) • Developmental Planning • Transport Studies
Mangaung	• Civil engineers • Town planning
Tshwane	• Transport modelling • Data acquisition and management • Macro, meso and microscopic modelling • Civil engineering • Traffic engineering • Town planning

	Skills profile
	• Transport planning
Secondary Cities	
Drakenstein	• Civil engineering
Mbombela	Interview not done
Mogale City	No transport planners
Msundizi (Pietermaritzburg)	• Civil engineers
Newcastle	No transport planners
Polokwane	• Transport Planning
Rustenberg	• Civil engineers
Sol Plaatjie	• Transport engineers • Traffic engineers
Stellenbosch	• Transport planning • Traffic engineers
Umhlathuze (Richards Bay);	Interview not done
Provincial Departments	
Eastern Cape Provincial Department of Transport	• Civil engineer
Free State Department of Transport	• Transport economics • Civil engineers • Town planners • Urban planners • Administration.
Limpopo Department of Transport	• Transport planning • Transport economics • Project design

	Skills profile
Mpumalanga Department of Transport	• Planning • Monitoring and Evaluation
North West Department of Transport	• Transport economics • Transport management
Northern Cape Department of Transport	• Integrated Transport Planning • Surveys • Data Analysis
Western Cape Department of Transport	• Engineers • Town planners

Source: Interviews with relevant officials and questionnaire

It is evident that although not all transport planners are qualified as transport planners, they often possess a subset of the skills to undertake this function within their departments. These include town planners and civil engineers which have done transport planning modules in their undergraduate training. Some institutions (City of Cape Town) have a more comprehensive complement of skills (e.g. Environmental Impact Assessment [EIA] Engineers) to contribute to transport planning. Similarly, Tshwane has macro, meso and microscopic modelling within transport planning.

Some municipalities have the sought-after skills such as traffic engineering (e.g. Stellenbosch) but lack many of the other skills and capacity to undertake transport planning.

6.1. Shortage of transport planners

Irrespective of the possession of qualifications, there is a definite shortage of transport planners across government, and not only in the municipalities. The number of planners involved in transport planning is shown in Table 17.

Table 17: Number of transport planners in government institutions (provinces and municipalities)

	Number of employees	Total number of planners
Metro		
Buffalo City	N.A.	4
Cape Town	26 000	2 921*
Ekurhuleni	2 120	2
eThekwini	No interview	N.A.
Johannesburg	N.A.	6
Nelson Mandela Bay	N.A.	04.
Manguang	N.A.	5
Tshwane	19 000	9
Secondary Cities		
Drakenstein	1 686	1
Mbombela	No interview	N.A.
Mogale City	N.A.	0
Msundizi (Pietermaritzburg)	4 000	5
Newcastle	N.A.	0
Polokwane	1 556	3

	Number of employees	Total number of planners
Rustenberg	N.A.	1
Sol Plaatjie	N.A.	4
Stellenbosch	1 150	1
Umhlathuze (Richards Bay)	No interview	N.A.
Provincial Departments		
Eastern Cape Provincial Department of Transport	1500	1
Free State Department of Transport	N.A.	5
Kwa Zulu Natal Provincial Department of Transport	N.A.	4
Limpopo Department of Transport	2 111	6
Mpumalanga Department of Transport	N.A	4
North West Department of Transport	1 345	11
Northern Cape Department of Transport	338	1
Western Cape Department of Transport	2 243	3

Source: Interviews with relevant officials and questionnaire
Note: Still awaiting data from several entities
** Inclusive of all staff in the transport authority*
Interview complete – Still awaiting data; N.A.- not available

It can be observed from the information gathered from respondents that most institutions do not commit sufficient resources to transport planning. The Ekuruhleni Municipality only has two dedicated individuals assigned to this function; whilst the Mangaung Municipality has five people assigned to this function. Newcastle does not have any transport planners.

In contrast, the City of Cape Town has 2 921 individuals assigned to 'planning'. It is notable that the City of Cape Town has a Transport and Urban Development Authority (TDA) which is responsible for holistically developing transport and other planning (e.g. urban roads) within the City of Cape Town. This is to ensure (unlike the other municipalities interviewed) integrated planning involving transport planners, urban planners, spatial planners, and human settlement specialists to collaborate in the formulation of transport planning. The TDA is an amalgamation of the Transport for Cape Town (TCT] (the city's transport department) and the Urban Development Department which added the functions of Urban Planning, Human Settlements and Urban Sustainability. Subsequently, the TDA was given a broader mandate than transport planning to develop a strategy to reverse the effects of apartheid through the social, economic and spatial transformation of the City (TCT, 2017).

6.2. Profile of transport planners

The profile of transport planners varies across the spheres of government. The profile analysis of transport planners presented here is informed by certain constraints; and any inferences must be cautioned against for several reasons. Firstly, the project was confined to the seven metros (eThekwini did not participate), nine secondary cities (Mbombela did not participate); and eight provincial departments of transport. Subsequently, most municipalities, where there is a dire shortage of transport planners were excluded, although they seemingly get assistance from the provinces and larger district municipalities.

Secondly, the unclear definition of planners may ensure that individuals who are not intimately involved in planning to be counted as a transport planner such as the TDA which counts all its employees as transports planners. The entity with the second most number of transport planners is the North West Department of Transport which has eleven transport planners. The City of Tshwane (geographically larger than Cape Town) only has nine transport planners, although there may be individuals outside the transport planning unit (e.g. BRT) involved with transport planning. It would appear that City of Cape Town employed an extended definition of the concept of a transport planner.

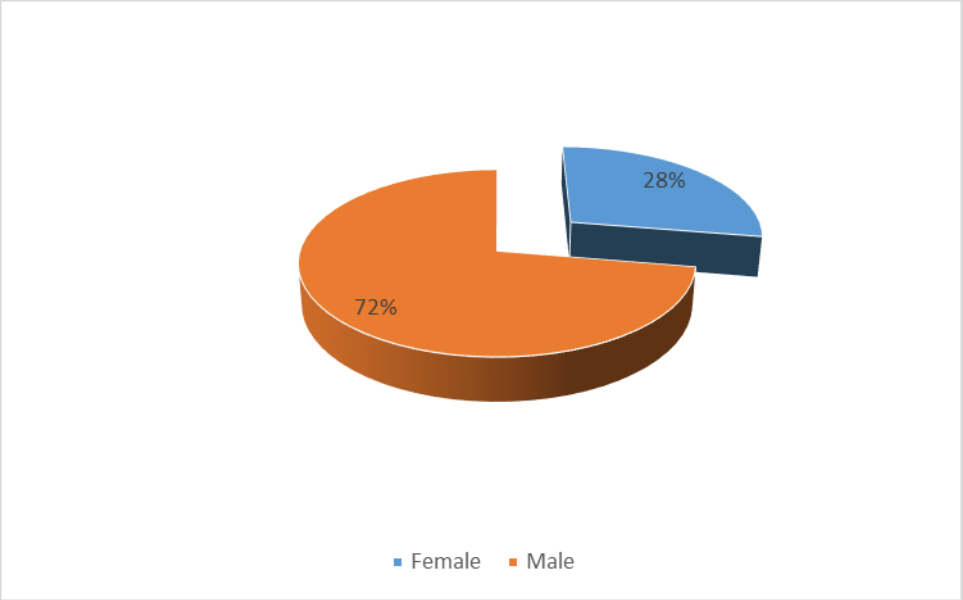
Finally, the information was provided by the respondents who were not always privy to the actual data. The participants only knew of transport planners in their unit or department. Several municipalities (Sol Plaatjie, Rustenburg, Umhlathuze) had other department such a roads and traffic which were also involved in transport planning. These employees were largely excluded, as the respondents did know of or about them.

Nonetheless, these restrictions do not diminish the general conclusions emanating from the profile of the planners. The findings can be judiciously extrapolated to provide an overall perspective of the profile of transport planners in South Africa, particularly metropolitan municipalities and secondary cities.

6.2.1. Profile of planners, by gender

The transport planning vocation in the public sector employs mainly males as shown in Figure 2.

Figure 2: Profile of total transport planners, by gender

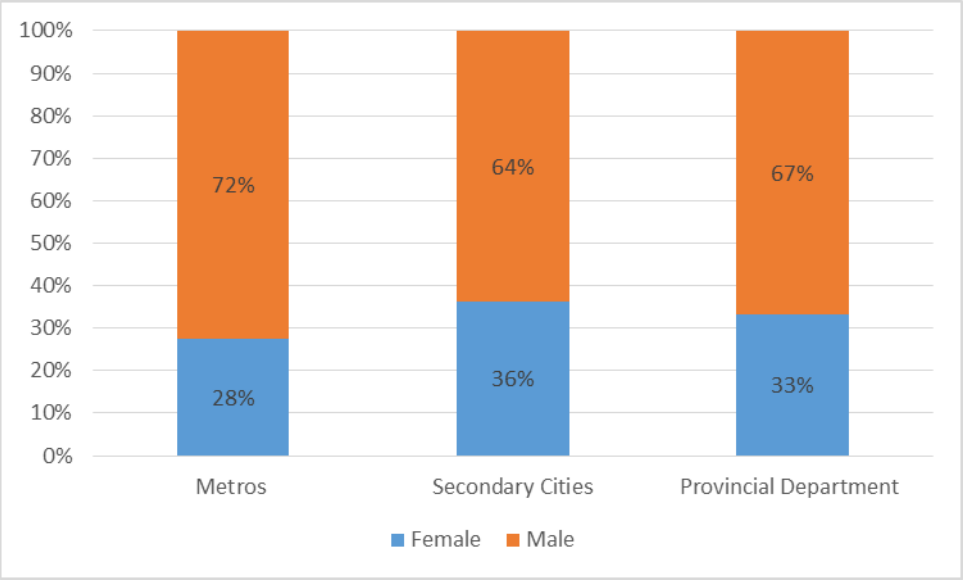


Source: Data from fieldwork research
Own calculations

It can be seen that 72% of transport planners are males. It concluded that the analysis is influenced by the larger number of male 'transport planners' within the City of Cape Town. The exclusion of City of Cape Town from the data reveals that there are still more male transport planners (58%) in comparison to female transport planners (42%). It would be more instructive to compare the gender of transport planners between each of the metropolitan municipalities, secondary cities and the provincial departments.

It can be observed in Figure 3 that the difference between male and female transport planners in the metros is similar to the gap between the total number of male and female transport planners.

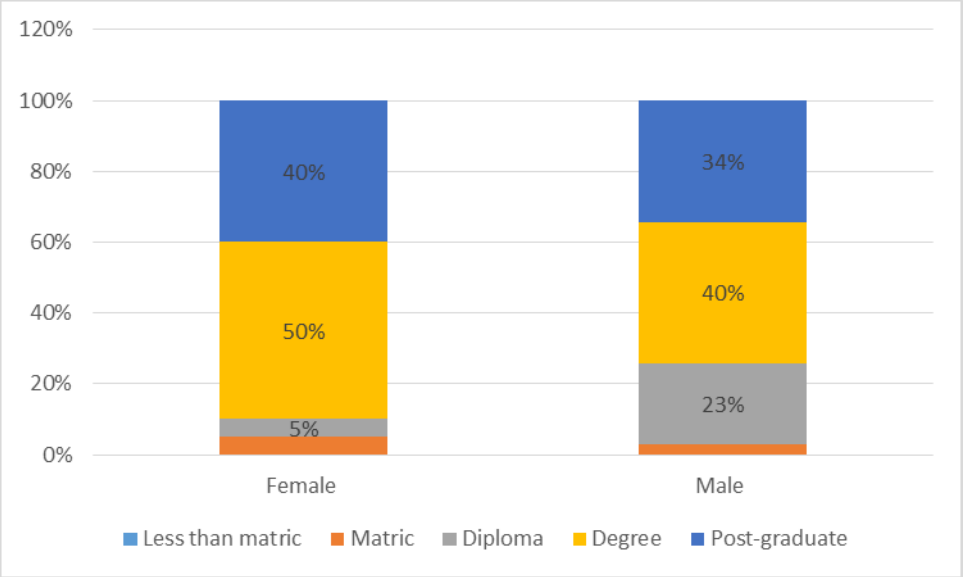
Figure 3: Transport planners in municipalities in the metropolitan municipalities, secondary cities and provincial departments, by gender



Source: Data from fieldwork research
Own calculations

However, there is also a relatively vast gap between male and female transport planners within secondary municipalities and provincial departments elucidating the divide between male and female transport planners within the public sector. Some municipalities (Drakenstein, Umhlathuze and Stellenbosch) only had male transport planners, albeit one in each municipality. It is notable that females are now entering the profession. The Ekurhuleni municipality only has two transport planners who are female with post graduate qualifications. The City of Johannesburg, on the other hand, has a majority of female transport planners. Figure 4 shows the qualifications of transport planners by gender.

Figure 4: Education qualifications of transport planners, by gender



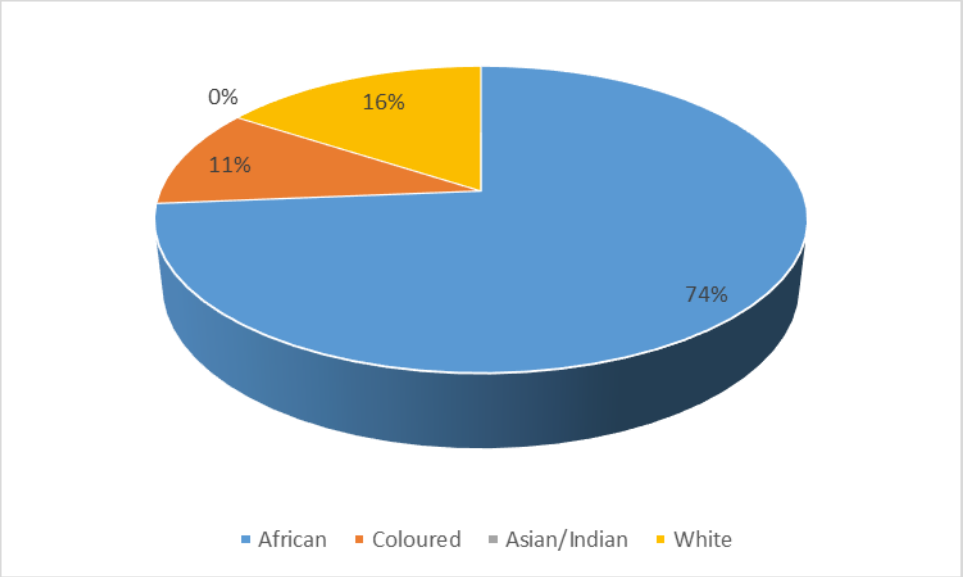
Source: Data from fieldwork research
Own calculations
Notes: Data excludes the City of Cape Town which did not provide the data

Interestingly, 90% of female transport planners have either a degree or post-graduate qualification in comparison to 73% of male transport planners. Consequently, more male transport planners have diplomas (23%) in comparison to female transport planners (5%). It is notable that these qualifications may not necessarily pertain to transport planning; particularly at an undergraduate level as transport planning is presently not offered as an undergraduate degree. However, the postgraduates most probably do have a transport planning qualification.

6.2.2. Profile of planners by race

A delineation of transport planners reveals that most transport planners are African as shown in Figure 5.

Figure 5: Total number of transport planners, by race

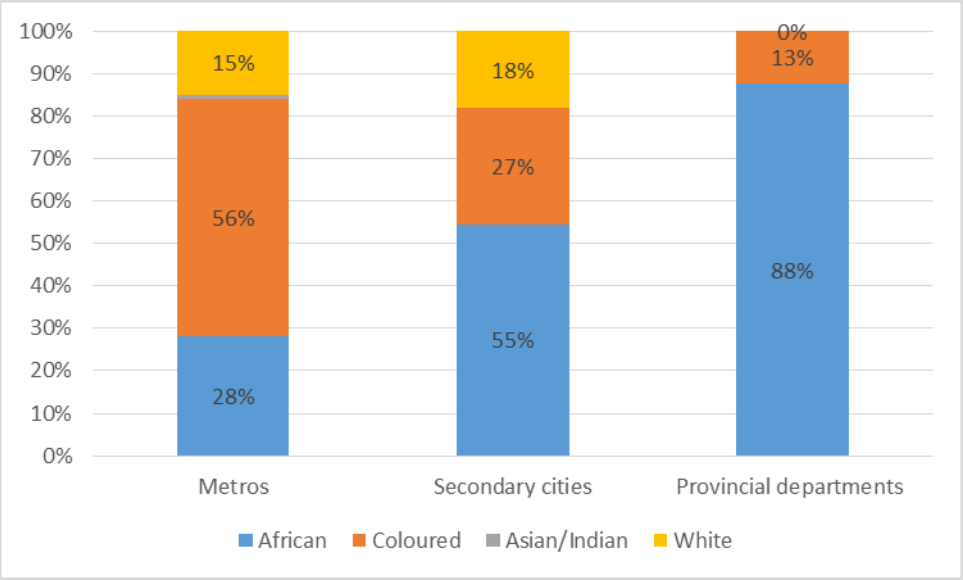


Source: Data from fieldwork research
Own calculations
Notes: Data excludes the City of Cape Town which is bias towards Coloured transport planners

The analysis reveals that 74% of transport planners in public sector are African, compared to 16% who are White and only 11% who are Coloured. It is notable that there are no Asian/Indian transport planners. The eThekwini municipality which has a relatively higher density of Indian population did not participate in this study – it could possibly have some Asian/Indian transport planners.

The data also excludes the City of Cape Town which indicated that 56% of its transport planners (1 640) were Coloured. This would have skewed the analysis since not all these individuals would be comparable with the transport planners in the other entities. Consequently, these figures exclude the transport planners from the City of Cape Town and under-represents the number of Coloured transport planners in government. A demarcation of transport planners by metros, secondary cities and provincial departments by race emphasises this bias as seen in Figure 6

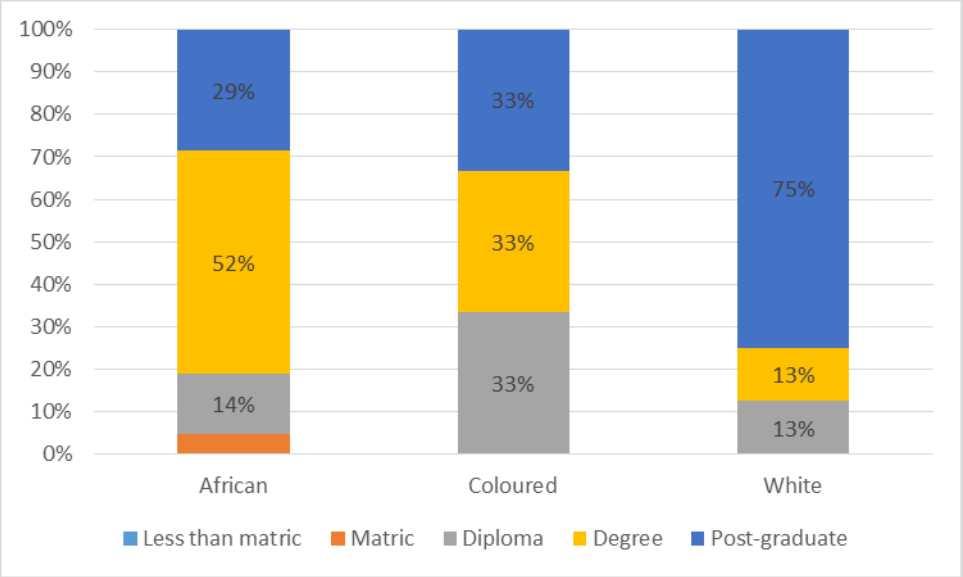
Figure 6: Transport planners in the metropolitan municipalities, secondary cities and provincial departments, by race



Source: Data from fieldwork research
Own calculations

It can be observed that the data from the City of Cape Town results in there being more Coloured transport planners than all the other race groups together, which is evidently incorrect when one compares City of Cape Town with the other metros and municipalities. An examination of the secondary cities and provincial departments reveal that Coloureds comprise 27% and 13% of transport planners respectively. Interestingly, there are no White transport planners within the provincial departments, although there are White transport planners in the secondary cities. There are no Asian/Indian transport planners in the provincial department of transport. Consequently, this group is not considered in the education qualification of transport planners by race groups as observed in Figure 7.

Figure 7: Education qualification of transport planners, by race



Source: Data from fieldwork research
Own calculations
Note: Excludes Asian/Indian population group
May not add up to 100 due to rounding

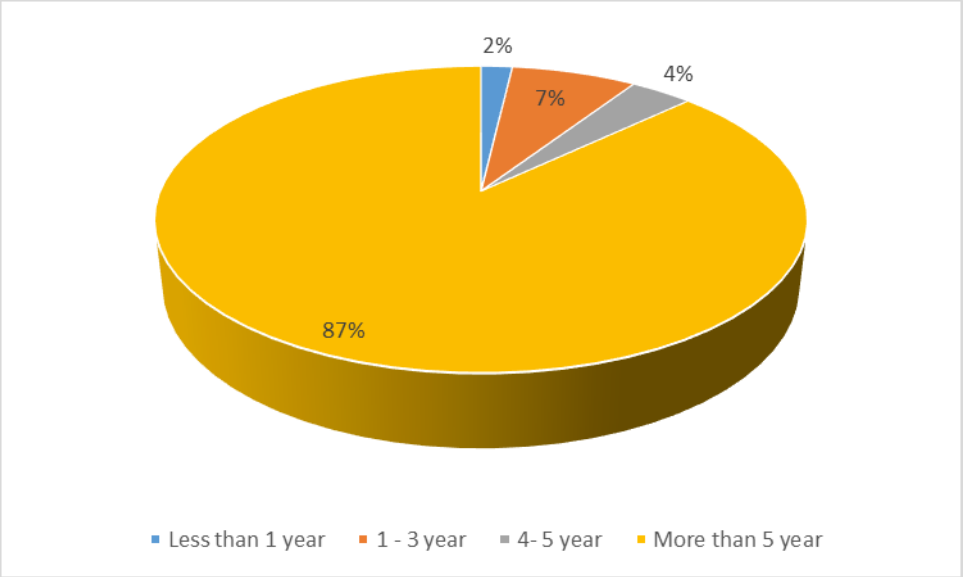
The analysis of education qualifications by race reveals that most African transport planners (52%) have a degree. Conversely, only 13% of Whites have a degree with most White transport planners (75%) having post-graduate qualification. The diploma qualification is relatively similar between Africans (14%) and Whites (13%) but much higher for Coloureds (33%). There is a similar distribution of diploma, degree and post-graduated qualifications in the Coloured population group.

Nevertheless, it was asserted by numerous practising transport planners in the interviews that they were occupying their position due to their experience within the transport environment; and not necessarily because of their qualifications.

6.2.3. Profile of transport planners, by experience

The scarcity of professionally accredited skills has resulted in transport planners obtaining knowledge and skills from work experience to undertake the duties that are commensurate with the position. Figure 8 illustrates the experience of transport planners within the public sector.

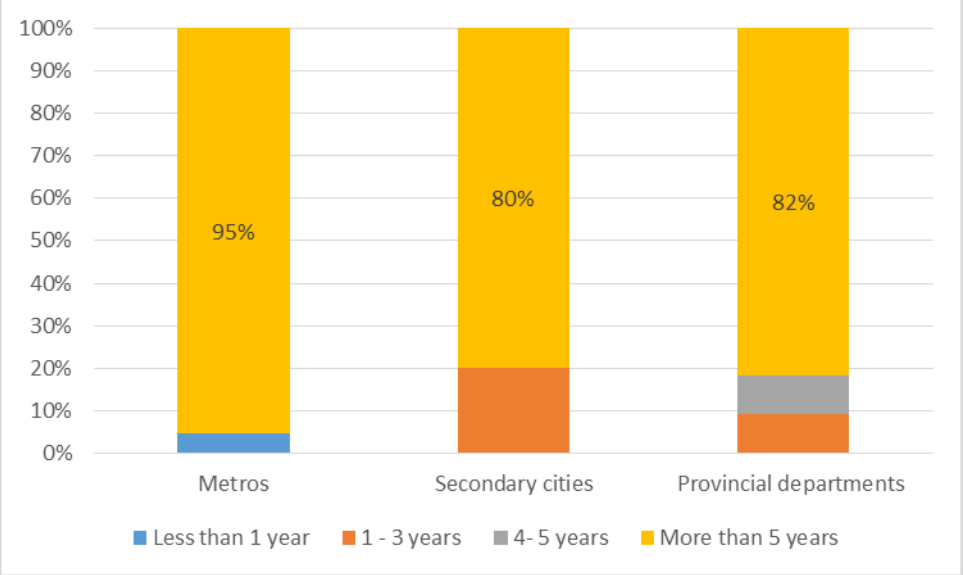
Figure 8: Transport planners, by years of experience



Source: Data from fieldwork research
Own calculations
Notes: Data excludes the City of Cape Town which did not provide the data

Most transport planners have more than 5 years' experience (87 per cent), with only 2% with less than one year's experience. Similar results are found when the experience is delimited between the metros, secondary cities and the provincial departments as denoted in Figure 9.

Figure 9: Transport planners in municipalities in the metropolitan municipalities, secondary cities and provincial departments, by experience



Source: Data from fieldwork research
Own calculations
Notes: Data excludes the City of Cape Town which did not provide the data

Not unexpectedly, most of the transport planners have substantial experience with 95% having more than 5 years of experience. This poses a risk from two perspectives. Firstly, the incumbent transport planners with numerous years of knowledge and practice will be retiring in the near future and there are no adequately-experienced individuals to replace them. There could be a loss of 'institutional memory' within these organisations. For example, the youngest transport planner in the Mangaung Municipality has more than 15 years' experience.

Secondly, the current transport planners, with little theoretcial knowledge of transport planning (but much experience) may not be attuned to the latest theoretical advancements in the field to the detriment of the organisation. This is amplified by the inability of individuals (due to lack of time and resources) to advance their knowledge and skills within this domain.

6.2.4. Lack of skills to undertake transport planning

Transport planning requires the inputs of many disciplines and should not be restricted solely to engineering. Important disciplines that need to be considered include urban planning, town planning, environmental studies, and geography, amongst others, in the broader education and training of transport planners. Consequently, a lack of consideration of a diversity of relevant disciplines in the transport planning education and training process will delay the attainment of transport objectives. Hence, it would be judicious to scrutinise the supply (or lack thereof) of skills that are involved in transport planning and not just restrict the analysis to engineers who can function as transport planners.

The focus on the critical and scarce skills of transport planners does provide a vital starting point to build capacity within the transport planning domain.

It was clearly expressed (see Table 17) by most institutions (municipalities and provincial departments' of transport) that there was an overall dearth of transport planners in the country. This found expression in the inability of numerous municipalities to formulate their ITPs. For example, the uMhlathuze municipality has never developed an ITP. This is due to a critical need for skills for the following functions, namely:

- Facility planning
- Law enforcement
- Infrastructure planning (road and rail upgrades required etc.)
- Integration of public transport services
- Land-use/spatial planning (NDoT, 2014)

Often these functions are provided to municipalities by the provincial departments; although the provincial departments themselves sometimes lack the resources (human and financial) to assist. Nonetheless, at the minimum, municipalities are required to have these requisite skills.

Since transport planning is a post-graduate qualification, professionals that choose this domain already have undergraduate qualifications in other disciplines; and most often in town planning or civil engineering. Consequently, they will lack the skills sets of the other disciplines or may be strong in some aspects of transport planning and not others. For instance, individuals with a background in town and regional planning will have a stronger ability in regional and rural development planning, whilst the civil engineer will have an affinity for more quantitative aspects of transport planning such as travel demand forecasting and travel impact assessments.

Furthermore, whilst these disciplines may exist in a municipality, there could simultaneously be a shortage in the costing component of transport planning which is in the realm of transport economics. Deliberations with institutions (e.g. Limpopo Department of Transport) revealed a shortage of transport economists. Conversely, some institutions (Free State Department of Transport) had transport economists but were 'misplaced' in the sense that they were undertaking administrative tasks.

Several entities (e.g., Mangaung, Sol Plaatjie) affirmed that a critical skill that is in high demand was traffic engineers. Other skills that were reported to be in short supply included municipal engineering (Stellenbosch), and design and contract management (Sol Plaatjie). Some skills requirements were specific to certain entities such as the lack of project research, project design and planning skills in the Limpopo Department of Transport, and geographic information system (GIS) engineers in the Northern Cape Department of Transport. Although these skills are sorely lacking in the provincial department, the impact is not restricted to the provinces but is also felt by municipalities as provincial departments support the municipalities within their provinces.

It is notable that an area that is neglected across all spheres of government is transport planning for vulnerable groups such as the disabled. That is, universal access is not being considered in the formulation of transport strategies. Admittedly, this is not only due to a lack of competencies within several municipalities; but also due to cost implications which affects the budget. But there is a lack of skills within this arena of government including the metropolitan municipalities which ignore such imperatives in their transport planning.

6.3. Lack of transport planning

Often the municipalities, and even the provincial departments, do not have a co-ordinating unit with all the relevant people to undertake transport planning. These divisions work in 'silos' with little collaboration with other divisions (e.g. urban planning, town planning). Very

often transport and planning skills are in different divisions. The City of Cape Town has recognised the need for an integrated approach with the establishment of the TDA which they attribute to the successful implementation of transport projects. In contrast, the other metros form ad hoc committees from a myriad of divisions when formulating transport planning interventions.

Transport planning is considered by the strategic planning sections, but is often ignored by the operations sections. The authorities primarily focus on urban planning and urban design and do not view transport planning as a priority; and only later realise that they do not have the in-house competencies and skills. The ITP is often more an infrastructure plan than an integrated plan.

In some municipalities, critical functions such as roads are separate from transport planning; and committees are formed for specific projects. In some departments it is combined but the priority is diluted as there are other additional responsibilities. The Free State Department of Transport not only includes road but also incorporates Police.

It is often not seen as a priority by the authorities. Most municipalities (e.g., Stellenbosch, Drakenstein, Sol Plaatjie, and Polokwane) have positions on their establishment (funded posts) but these often are not filled. It is often not due to the lack of available skills; rather the function may not be deemed important by the authorities within the municipality.

Even communities do not prioritise transport planning during engagements with regards to inputs into the integrated development plan (IDP). There is more emphasis on water, sanitation and electricity; and if there is a focus on transportation, it is primarily restricted to the provision of roads.

However, capacity is being developed in the construction of the Bus Rapid Transport (BRT), where participating municipalities (e.g., Rustenburg, Polokwane) have to bolster transport planning capacity within the departments. This capacity will be absorbed into the municipality once the BRT has been rolled out. Moreover, the BRT unit will also aid other sections, where possible, to augment transport planning capabilities of municipalities.

But some municipalities just do not have the capacity, particularly the rural municipalities. The Limpopo Provincial Department of Transport provides assistance to district and local municipalities where 70 -80% of them have no transport planning function or unit. Most equate transport planning with traffic management. The larger municipalities have some capacity. Smaller municipalities do not even have transport planning. Many have an engineering section which is responsible for transport planning.

The provincial department assists municipalities in the formulation of the ITPs although there are limited resources and capacity within the provinces themselves to undertake this function. Some district municipalities (Vhembe. Waterberg, Mopani) in Limpopo do have

transport planning units limited to one or two people; who are more involved with traffic management; and not transport planning.

The situation is seemingly worse in the secondary cities where there appears to be a lack of the transport planning function altogether. The Sol Plaatjie Municipality concentrates on overall planning, focussing on roads and storm-water and not specifically on transport. Similarly, Limpopo and North West planners are generic planners with no exclusive focus on transport planning as they concentrate on other functions with transport planning as an integrated component of their vocation.

There are some secondary cities that devote little attention and resources to transport planning. The Stellenbosch Municipality only has one transport planner as does the Rustenburg Municipality. Consequently, there is lack of capacity to effectively plan for transportation within these municipalities.

Transport planning in some secondary cities appears to be bolstered by support from the provincial level. The Limpopo Department of Transport assists the 23 Local and 5 District municipalities within its jurisdiction, specifically in terms of its ITP and subsequent Integrated Development Plan (IDP). Similarly, the Northern Cape Provincial Department of Transport support its 5 District and 31 Local municipalities.

However, some provincial departments lack the capacity to undertake the transport function that is required in terms of their mandate and are unable to assist the local municipalities. For instance, the Mangaung municipality has more transport planning capabilities than the Free State Department of Transport. Similarly, the City of Cape Town has a more comprehensive and cooperative approach (through the TDA) than the province itself.

6.3.1. A collaborative approach to transport planning

Transport planning requires the input of many disciplines and should not be confined solely to engineering. These include urban planning, town planning, environmental specialists, spatial planning and other disciplines in order to execute a project to realise transport planning imperatives. Consequently, a lack of these inputs into the transport planning process will delay the attainment of transport objectives.

The City of Cape Town has recognised the need for an integrated approach with the establishment of the TDA which they attribute to the successful implementation of transport projects. The City of Cape Town has an extensive transport network that needs to accommodate and cope with approximately 2.5 million passengers daily across all modes of transport (TCT, 2015).

A distinctive feature of the transport planning in the City of Cape Town in comparison to other metropolitan municipalities is that its transport authority (TCT[3]) is not established in terms of the NLTA, but rather in terms of the Municipal Systems Act (Whitehead, 2016). This allows local government to establish by-laws that govern its functions and responsibilities. By-laws are more long-term and cannot, like policy, be easily be changed. Accordingly, the integrated transport vision of the City is not susceptible to the vagaries of the five year political cycle to undermine long term planning (TCT, 2015). The Constitution By-law, No 7 208 of 2013 is the enabling legislation of the TCT. This by-law emphasizes the lifecycle of transport allowing for integrated intermodal and interoperable transport and service delivery (Whitehead, 2016).

The TDA has developed the Transport Development Index (TDI) to evaluate the effectiveness of its transport service delivery interventions to the various user groups across different income brackets and in different areas of the City (TCT, 2015). This enables the TDA to set objective targets and empirically appraise its performance. The TDI provides findings which informs its long term planning strategies. For instance:

- 95% of public transport users are in the low and medium income groups;
- The largest priority cost for the low-income user group is the direct cost for public transport users who are in far-flung areas. Otherwise the largest priority costs are flexibility, safety and crime; and
- The average direct transport cost for the low income public transport user group is 45% of monthly household income, against the internationally accepted norm of between 5 and 10% (Whitehead, 2015)

Although the data emanating from the TDI makes for uncomfortable reading, it is a critical input into TDA's investment priorities (TCT, 2015). The TDI allows for the City authorities to better plan and the implement strategies. For example the TDA will spend R750-million on road infrastructure projects over a period of five years to address congestion in Kommetjie, Kuils River and Blaauwberg (Wheels24, 2017).

The overall planning paradigm has contributed to the rollout of the Bus Rapid Transport (BRT) [MyCiTi] within the City of Cape Town. By 2015, MyCiTi was transporting on average 59 184 passengers every weekday with the MyCiTi buses covering a distance of over 1 270 000km each month (Asmal, 2015).

The BRT, as part of governments strategy to improve public transport, is meant to be implemented in 12 other cities including Johannesburg, Nelson Mandela Bay, Tshwane, eThekwini, Rustenburg, Mbombela, George, Mangaung, Polokwane and Tshwane. This process has started in all these cities with varying degree of success. The implementation of the BRT has brought to the fore the need for transport planning with these cities. The

[3] The TCT is the predecessor of the TDA

establishment of BRT units in municipalities (e.g. Polokwane and Rustenburg) has improved transport planning capabilities within the municipalities and will be absorbed and integrated into the overall transport planning directorate once the project is complete.

The Nelson Mandela Bay Municipality (NMBM) has not yet had a fully integrated BRT due to challenges with either the taxi operators or implementing agents (Asmal, 2015). The 60 buses that were procured in 2009 (R100 million) as part of the integrated public transport system were still lying idle in 2015 (City Press, 2015).

eThekwini launched its BRT GO!Durban in 2015 and is expected to connect 600 000 commuters across the city by 2027 (Soth African Government, 2017). It is further anticipated that 85% of residents will be within 1 kilometre of a rapid public transport network by 2020 (eThekwini Municipality, 2017). The eThekwini Transport Authority (ETA) is not limited to the implementation of the BRT but oversees the implementation of a comprehensive integrated transport plan in key focus areas, namely:

- Public Transport
- Freight
- Roads systems management
- Safety
- Traffic management and control (eThekwini Municipality , 2010)

6.4. Skills development

The skills set of people involved in transport planning varies across the spheres of government. As alluded to earlier, the skills profile and the formal qualifications of planners vary across government institutions as there is no formal qualification to be a transport planner. The skills profile of planners traverse the transport planning terrain within the South African and vary across both municipalities and provincial departments.

Table 18: Skills development programmes

	Skills Development Programmes	Challenges Encountered
Metro		
Buffalo City	• Conferences and seminars	• Poor quality of education and training, esp. B.Techs • Lack of mentors
Cape Town	• Conference & seminars • Leaderships • Apprenticeships, • Bursaries, • Internship	• Lack of capacity
Ekurhuleni	• Conferences • Workshops - Not relevant: More for undergraduates	• Lack of capacity • Lack of understanding appreciation of planning
eThekwini	• No Interview	N.A.
Johannesburg	• Skills programmes, esp. at UCT • Conferences and seminars	• Economic modelling • Analysis of data, e.g. household travel
Nelson Mandela Bay	• Executive leadership •	• Lack of capacity • Lack of staff • Lengthy procurement procedures • Lack of advanced planning technologies knowledge • Unavailability of planning tools, i.e modelling, GIS, and other technologies

	Skills Development Programmes	Challenges Encountered
Mangaung	• Conferences	• Lack of skills and people • Traffic engineers – Rare skills
Tshwane	• Workshops (SA Cities Network) • Postgraduate Studies	• Linkage to provincial planning • Linkage to national planning • Lack of experience with software • Lack of capacity • Loss of staff • Lack of funding
Secondary Cities		
Drakenstein	• None	• Lack of capacity • Lack of skills • Lack of budget (high vacancy rate)
Mbombela	• No interview	• N.A.
Mogale City	• No transport planning division	• N.A.
Msundizi (Pietermaritzburg)	• Conferences • Short courses at SA universities	• Transport economics
Newcastle		
Polokwane	• Masters in Transportation Studies	• Lack of understanding in the roles of Transport Planners
Rustenberg	• None	• Insufficient funding • Lack of skilled staff • Legal unit delays
Sol Plaatjie	• Contract and Project Management	• Inadequate data • Lack of resources

	Skills Development Programmes	Challenges Encountered
		• Insufficient funding
Stellenbosch	• None	• No appreciation of transport planning • Lack of people and skills • Lack of tools
Umhlathuze (Richards Bay);	• Conferences	• Lack of capacity • Lack of skills • Lack of budget
Provincial Departments		
Eastern Cape Provincial Department of Transport	• Can sponsor B Tech studies.	• Retaining graduates
Free State Department of Transport	• Not attending – Due to budget constraints	• Lack of skills • Lack of capacity
Limpopo Department of Transport	• Research and planning	• Lack of skills • Lack of capacity • Retention of skills •
Mpumalanga Department of Transport	• Policy development and research	• Lack of transport units at the local government level
North West Department of Transport	• Only conferences	• Lack of skills • Leadership – Political head is not a transport person • Lack of budget
Northern Cape Department of Transport	• Transport Planning • Transport Modelling • Urban Planning • Non-motorised transport (NMT) planning	• Lack of capacity and support • Managing and overseeing consultants • Geographic Information Systems (GIS)

	Skills Development Programmes	Challenges Encountered
Western Cape Department of Transport	• Transport operations • Attend lectures at UCT on various aspects of transport planning • Conferences	• Leadership – To understand transport planning • No prioritising • Planning

Source: Interviews with relevant officials and questionnaire. N.A. – not available.

The lack of training in transport planning has precipitated a severe shortage of transport planners within the government sector especially municipalities (and provinces). The shortage is serious in the 'rural' provinces and municipalities with most respondents indicating that they are finding in difficult to attract individuals to the work in these areas. While the City of Cape Town has no problems attracting and retaining transport planners, other municipalities (e.g. Ekuruhleni) have many vacancies. Some municipalities have recognised the lack of skills and encourage and promote skills development programmes, although they do encounter challenges in executing these programmes.

Certain municipalities (e.g. Drakenstein, Stellenbosch and Rustenburg) do not prioritise transport planning and subsequently do not invest in any skills development of its transport planners Moreover, there are only a few transport planners within these municipalities which leaves little time for upgrading of skills. Other institutions (e.g. Mangaung, North West Department of Transport) with smaller complements of staff also face severe time constraints and elect to only attend conferences, which they find more appropriate and effective. In contrast, workshops are often not relevant when they are conducted by junior officials and are attended by senior government officials (Ekuruhleni).

The City of Cape Town has a dedicated training academy which formulates a Work Skills Programme (WSP) that is informed by a Training Needs Assessment (TNA). The academy assists the employees to identify their training needs and arranges for the upskilling through the learnerships, courses (bursaries), seminars and workshops as well as in-house training. The Western Cape Department of Transport has an arrangement with the University of Cape Town where their employees can attend classes at no cost, but do not write the examinations.

It can be observed that numerous municipalities have identified the importance of transport planning within their environment but confront several challenges. There is a definite shortage/supply of these skills which increases demand and the subsequent remuneration for these skills. Accordingly, it is becoming too expensive for some municipalities as they lack the budget. Several transport units are not allocated sufficient budget to undertake transport planning and bolster their capacity. Some institutions only have one (Stellenbosch, Rustenburg) person responsible for transport planning. Some entities, particularly in rural areas (Limpopo Department of Transport) have difficulty retaining transport planners.

While the technocrats appreciated the need for transport planning, the political leadership often does not. The political principals (even senior management) are not schooled in transport planning and do not appreciate the importance nor the intricacies of transport planning and the role it plays in development. Consequently, the person cannot defend or clearly articulate the transport challenges and the subsequent resources that are required in various fora.

Posts are not being filled due to the unavailability of skilled individuals to apply for the posts. Municipalities are not prioritising transport planning within the planning framework; and subsequently they are not committing sufficient resources (human and financial) to transport planning (e.g., Drakenstein, Stellenbosch Rustenburg, Polokwane). Moreover, while individuals from other disciplines can practise as a transport planner, many choose not to as it is not financially viable. For instance, town planners and engineers are considered a critical skill and are offered, in addition to their salary, an Occupation Specific Dispensation (OSD) which increases their remuneration by as much as 30%. This inducement is not offered to transport planners.

6.5. Transfer of learning in the workplace

The lack of commitment of the leadership and financial resources and capacity has deterred municipalities from empowering, capacitating and growing their skills base. The transfer of learning is often non-existent in some entities (e.g., Drakenstein, Stellenbosch, Sol Plaatjie), and Free State Department of Transport) due to the lack of personnel, but is actively promoted and supported in others as observed in Table 19.

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Table 19: Transfer of learning

	Is transfer of learning taking place?	Type of transfer of learning
Metro		
Buffalo City	• No	
Cape Town	• Yes	• Coaching • Mentoring
Ekurhuleni	• No	• Only 2 people in the unit
eThekwini	N.A.	
Johannesburg	• Yes	• Mentoring
Nelson Mandela Bay	• No	
Manguang	• Yes	• Mentoring of juniors by the seniors • On the job training
Tshwane	• Yes	• Mentoring
Secondary Cities		
Drakenstein	• No	• None
Mbombela	• N.A.	
Mogale City	• Not applicable	
Msundizi (Pietermaritzburg)	• Yes	• Mentoring
Newcastle	• Not applicable	
Polokwane	• Yes	• Workshops • Attendance of formal programmes with institutions and regular presentations
Rustenberg	• Yes	• Consultants
Sol Plaatjie	• No	• None

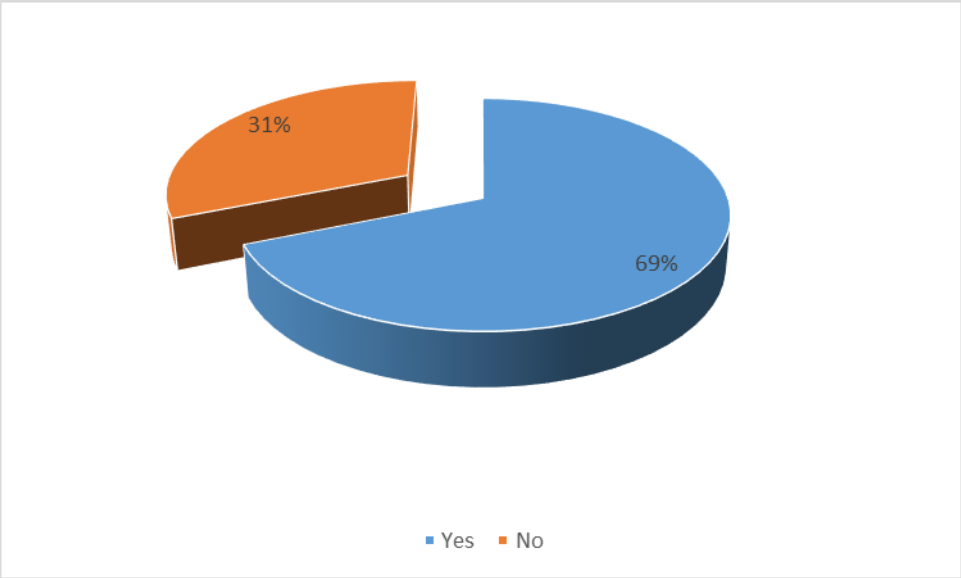
	Is transfer of learning taking place?	Type of transfer of learning
Stellenbosch	• No	• None
Umhlathuze (Richards Bay);	• No	• None
Provincial Departments		
Eastern Cape Provincial Department of Transport	• Yes	• Mentoring
Free State Department of Transport	• No	• None
Limpopo Department of Transport	• Yes	• Informal – Discuss the themes after attending conferences
Mpumalanga Department of Transport	• Yes	• Internship
North West Department of Transport	• Yes	• Workshops • Mentoring • Coaching
Northern Cape Department of Transport	• Yes	• Training of interns • Workshops for municipality staff • Attending conference
Western Cape Department of Transport	• Yes	• Sharing of ideas and information from conferences •

Source: Interviews with relevant officials and questionnaire; N.A. – not available

The transfer of learning is achieved through the attendance of conferences, workshops as well as mentoring and coaching of junior staff. The City of Cape Town has a database of employees who are available for mentoring and coaching. The Mangaung Municipality offers continuous on-the-job training with a senior employee. The junior personnel learn from this on-the-job training. All new appointments have to follow the same process. Sharing of knowledge takes place between the seniors (those that attend conferences) and junior personnel (e.g. Western Cape Department of Transport)]. Nevertheless, despite all these interventions there is a definite shortage of transport planners at the local and provincial) spheres of government.

Most institutions (69%) indicated that transfer of learning is actually taking place as denoted in Figure 10.

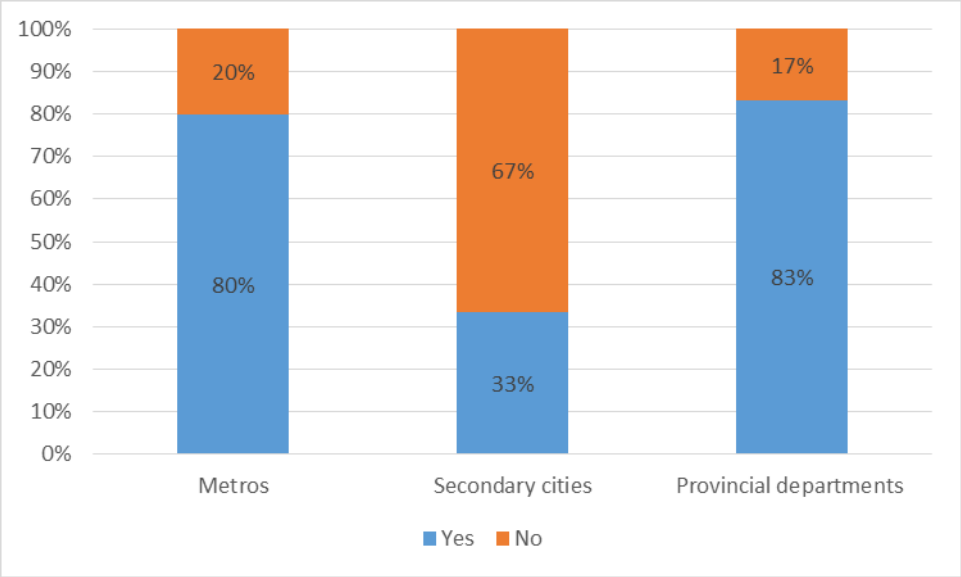
Figure 10: Transfer of learning across all institutions



Source: Data from fieldwork research
Own calculations

However, the quality of the transfer of learning varies across entities and the resources available to make provision for the transfer of learning in the work place are often lacking. Most provincial departments affirmed the transfer of learning taking place in their institutions as shown in Figure 11.

Figure 11: Transfer of learning in the metros, secondary institutions and provincial departments



Source: Data from fieldwork research
Own calculations

Some form of transfer of learning is taking place in 83% of provincial departments of transport; although the form and quality is unknown. Severe constraints within the secondary cities is limiting the amount of learning that can be transferred within these organisations.

6.6. Strategies to attract transport planners

The lack of funding restrains the ability of certain institutions (e.g. Drakenstein, Stellenbosch) to attract and retain transport planners. Most of the others offer some type of scholarship or bursary as seen in Table 20.

Table 20: Strategies to attract transport planners

	Is there a shortage of planners?	What strategies are there to attract transport planners?
Metro		
Buffalo City	• Yes	• Recruitment from WSU
Cape Town	• No	• Internships • Bursaries
Ekurhuleni	• Yes	• Bursaries • Scholarships
eThekwini	• N.A.	
Johannesburg	• No	
Nelson Mandela Bay	• Yes	• Recruitment drive
Manuang	• Yes	• None – The youngest member has been there 15 years
Tshwane	• Yes	• None
Secondary Cities		
Drakenstein	• Yes	• None
Mbombela	• N.A.	
Mogale City	• No transport function	
Msundizi (Pietermaritzburg)	• Yes	• Education and training –funding being made available
Newcastle	• Yes	• None – no available funding
Polokwane	• Yes	• Young professionals programme • Memorandum of Agreement with the University of Limpopo for some of the capacitation needs
Rustenberg	• Yes	• Conditional Grant • Study Aid

	Is there a shortage of planners?	What strategies are there to attract transport planners?
Sol Plaatjie	• Yes	• Internships (planners) • Training
%	• Yes	None
Umhlathuze (Richards Bay);	• Yes	• None
Provincial Departments		
Eastern Cape Provincial Department of Transport	• No	
Free State Department of Transport	• Yes	• None – People have to do it on their own
Limpopo Department of Transport	• Yes	• Scholarships • Bursaries
Mpumalanga Department of Transport	• Yes	• Advertisements • Internships
North West Department of Transport	• Yes	• Bursaries
Northern Cape Department of Transport	• Yes	• Scholarships • Bursaries
Western Cape Department of Transport	• Yes	• Aid in the professional development of career – No dedicated bursary or scholarship

Source: Interviews with relevant officials and questionnaire; N.A. – not available

The bursary or scholarship ceases if students fail and will be have to be paid back if they discontinue their respective studies. The Rustenburg Municipality offers 'study aid' which is not payable should the individual not pass or ceases studying. Some entities (Limpopo Department of Transport) do not offer bursaries to study but refund the employees when they pass.

7. Conclusion

The relevance of transport planning for fostering economic growth is sometimes ignored by policy makers. However, the South African government is cognisant of the importance of transport planning and the contributions an integrated transport sector can make to economic development in the country. Consequently, authorities have implemented several strategies and policies to realise government's transport aspirations. These have, inter alia, included the National Land Transport Strategy Framework which underpins national transport strategies and directives that lower-spheres of government need to adhere to in South Africa. However, the attainment of transport goals is predicated on the notion that the country has sufficient financial and human resources.

Notwithstanding a lack of financial resources, this study clearly demonstrates that there is a shortage of skilled people across government, to undertake transport planning. The scarcity of transport planners is evidently more acute in the local municipalities.

Several factors are responsible for the lack of transport planning skills within government. Firstly, there is a severe shortage in the supply of transport planners. Universities are not producing a sufficient number of transport planners. Transport planning is offered as modules in undergraduate degrees (e.g. Civil Engineering) but not as stand-alone separate qualifications in South Africa. Hence, individuals can only attain a professional transport planning qualification at a post-graduate level, where the entry requirements may be prohibitive (e.g. under-graduate degree with a certain level of numeracy).

Secondly, while there is a demand for transport planners in the public sector, there is not a concomitant demand for transport planners in the private sector. Consequently, the universities are reluctant to formulate and deliver undergraduate transport planning degrees due to a potential lack of demand. The private sector is concerned that transport planning specialisation at the undergraduate level will restrict the professionals from practicing in the private sector if there is no work in the public.

Thirdly, there are often few opportunities and incentives to attract and retain transport planners within government. While some government institutions offer bursaries and scholarships, they are not specifically and exclusively targeted at enhancing transport planning capacity within the respective institutions. Moreover, incentives (OSD) offered to other disciplines (e.g. engineers in the built environment) prevent individuals from considering transport planning as a career choice or changing to transport planning

Fourthly, the political authority and/or senior management responsible for transport planning often does not have a background or training in transport planning. There is a lack of an understanding and appreciation of the importance of transport planning as a bedrock of economic development. These individuals cannot clearly articulate to their principals the challenges and the attendant resources required for optimal transport planning. Consequently, transport is relegated in the development agenda and only receives attention or priority when a crisis erupts.

Fifthly, there are limited opportunities (e.g. mentorship) in institutions for the transfer of skills and knowledge within the workplace. The absence of qualified professional staff and the lack of time and resources constrains senior staff in providing the necessary leadership and assistance to junior staff to grow and develop in the transport planning domain.

These elements have culminated in a dire shortage of qualified transport planners within government, thereby undermining its mandate to provide efficient and effective public transportation. Consequently, government has to review and implement strategies to moderate these challenges through the development of more transport planners.

8. Recommendations

The lack of transport planning skills and concomitant transport planners within government, especially within municipalities is multifactorial. The recommendations advanced here are aligned with the mandate and capacity of the LGSETA; and are aimed at addressing the challenges confronted by municipalities and provincial departments of transport

1. Any proposal to improve the situation needs to be inclusive of the inputs of the main role-players in the transport planning environment. A round-table forum and/or dedicated working group should be established to frequently engage on pertinent matters regarding transport planning within government. These should, inter alia. include the National Department of Transport, Provincial Departments of Transport, South African Council of Planners, selected municipalities (Metros, Districts, Local), LGSETA, South African Local Government Association and the relevant universities. This will enable stakeholders to collectively identify the common barriers undermining transport planning; and subsequently develop suitable strategies that are agreeable to all participants. This will prevent unintended and unnecessary replication of initiatives and a concomitant waste of resources.

2. The LGSETA should endeavour to assist district municipalities and local municipalities to strengthen capacity in those municipalities that already have some capacity in transport planning. Consequently, these municipalities can assist other municipalities with their transport planning.

3. The LGSETA should enter into formal arrangements with the Provincial Departments of Transport to augment and enhance their capacity to support local municipalities with transport planning.

4. The LGSETA should engage with the National Department of Transport to fund one or more **Chairs in Transport Planning** in one or two universities (UCT and Stellenbosch appear to be ideal candidates) to deliver a Master's degree or Post-Graduate diploma in transport planning that is open to students from a wide range of academic backgrounds such as town and development planning, economics, geography, energy, environment, sociology and psychology. The greatest challenge in transport in South Africa is to change people's behaviour towards transport, in particular, public transport; hence the need for more graduates from planning and social science backgrounds, rather than engineering. We need to move away from the historical obsession in South Africa with transport planning being exclusively associated with an engineering degree.

5. The LGSETA in collaboration with the South African Local Government Association should fund research to investigate and identify areas of transport planning that need urgent attention.

6. The LGSETA could offer funding (through scholarships, bursaries, learnerships) in terms of its mandate to develop capacity within local government.

7. The LGSETA should provide incentives (e.g. monetary) for current transport planners to provide the transfer of learning to junior staff.

8. The LGSETA can engage with national government to make available the Occupation Specific Dispensation for transport planners by deeming it a scarce and critical skill.

9. The LGSETA should formalise relationships with the relevant transport authorities (City of Cape Town Transport and Urban Development Authority) to transfer knowledge to jurisdictions where it is lacking.

10. There is an urgent need to fund professional development courses in areas such as economic modelling; undertaking travel surveys; changing commuter behaviour; transport economics; and transport and the environment.

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A. Annexure A: Questionnaire

LGSETA

WSG

RESEARCH ON TRANSPORT PLANNERS IN SOUTH AFRICA'S MUNICIPALITIES

DRAFT QUESTIONNAIRE

Name of Municipality:

Province:

Type of Municipality:

Number of Employees:

Transport Planning

1. **Number of planners**
   a) **By race**

Total	African	Coloured	Indian/Asian	White

b) By gender

Total	Female	Male

c) By years of experience

Years of experience	Number of planners
Less than 1	
1 - 3	
4- 5	
More than 5	

2. Education Qualifications

a) By race

Education	African	Coloured	Indian/Asian	White
Less than Matric				
Matric				
Diploma				
Degree				
Post-graduate				

b) By gender

Education	Female	Male
Less than matric		
Matric		
Diploma		
Degree		
Post-graduate		

3. Skills Development Programmes

What skills development programmes have your planners attended? Explain.

4. Skills profile of planners?

5. What challenges are encountered by transport planners in the execution of their duties?

6. Is their transfer of learning in the workplace?

7. a) Is there a shortage of transport planners?

c) If so, what strategies are in place to attract planners to your municipality (scholarships, bursaries, training programmes)?

B. Annexure B: Field visit interviews

Department /Institution	Participant	Designation	Contact Number	Date	Type of engagement
Eastern Cape					
Buffalo City Municipality	Ms Sindiswa Dinge				Face to face meeting
Nelson Mandela Bay Municipality	Ms Z Zinto	IPTS Division	041 505 4420 (Secretary – Ms J Sampson)	03/04/2017	Email - Questionnaire
Eastern Cape Provincial Department of Transport	Mr Melon				Face to face meeting
Free State					
Mangaung Municipality	Mr Willie Loftus	Transport Planner	051 405 8708	24/03/2017	Face to face meeting
Free State Department of Police, Roads and Transport	Mr M. S. Sefuci	Regional Manager	051 403 7489	24/03/2017	Face to face meeting
Gauteng					
City of Johannesburg					
City of Tshwane	Mehboob Babamia	Acting Executive Director Transportation Planning	082 894 8063	22/03/17	Face to face meeting
Ekurhuleni	Rethabile Seotsangane	Information Systems Planner	011 999 3467	20/03/17	Face to face meeting
KwaZulu-Natal (KZN)					
eThekwini					
Msundizi (Pietermaritzburg)				17/03/17	Face to face meeting
Newcastle					Teleconference
Umhlathuze (Richards Bay);	Mr Jaco Schutte	Manager: Transport		06/04/2017	Face to face

Department /Institution	Participant	Designation	Contact Number	Date	Type of engagement
	Mr Solly Mbatha	planning Head of section: Public transport management and co-ordination			meeting
KZN Provincial Department of Transport	Mr Pat Dorkin			17/03/17	Face to face meeting
Limpopo					
Polokwane Municipality	Pilot Ramothwala Michel Mubevuka Molatelo Mashego	Planning Manager: Transport Systems Planning Town Planning	015 280 2204 015 290 2605 015 290 2075	23/02/17	Face to face meeting
Limpopo Department of Transport	Reuben Mukhavhuli	Head: Research and Planning	015 294 8371	23/02/17	Face to face meeting
Mpumalanga					
Mbombela	Mandla Nkosi				
Mpumalanga Department Public Works, Roads and Transport of Transport	Mr P Nyoni	Head: Power and transport	013 766 0832	04/04/2017	Email - Questionnaire
Northern Cape					
Sol Plaatjie	D Seeco N Keslamp	Transport Planner Town Planning	053 830 6675 053 830 6303	02/03/17	Face to face meeting
Northern Cape Department of Transport, Safety and Liaison	Connie Conradie M Modiko	 Transport Planner	 083 700 0065	02/03/17	Face to face meeting
North West					
Rustenberg	Simon Seitei Thandi Mtyotja	Skills Development Planner	079 454 7841	03/03/17	Face to face meeting
North West Department of Community Safety and	Josiah Morwe	Transport Planning &	018 200 8074/5	03/03/17	Face to face

Department /Institution	Participant	Designation	Contact Number	Date	Type of engagement
Transport Management		Coordination			meeting
Western Cape					
City of Cape Town	Ryan Ohlson Fuad Nordien	TDA Corporate H/R	021 417 2007 021 400 2696	09/03/17	Face to face meeting
Drakenstein	Deon du Plessis Carel Lotz	Senior Engineer in Roads, Storm water & Traffic engineer Deputy Exe Manger Civil Engineering Services	021 807 4703 021 807 6447	08/03/17	Face to face meeting
Stellenbosch Municipality	John Muller	Head: Transport Planning and Public Transport	074 048 4725	09/03/17	Face to face meeting
Western Cape Department of Transport	Faizel Williams Deidre Ribbonaar Mario Brown	Civil Engineer Chief Director - Statutory planning - ITPs,	021 483 6254 021 483 3946 021 483 2604	09/03/17	Face to face meeting
Other Stakeholders					
National Department of Transport	A. Gibberd	Director of Universal Design in Public Transport -	082 349 7703	15/03/17	Face to face meeting

Department /Institution	Participant	Designation	Contact Number	Date	Type of engagement
		Public Transport Network Development			
SACPLAN	Martin Lewis	Chief Executive Officer - Registrar	011 318 0460	10/03/17	Face to face meeting
SAPI	Maartjie Weyers	Professional Planner	082 375 3662	13/03/17	Teleconference
UNISA - Centre for Transport Economics, Logistics and Tourism 3rd Floor	John Barendrecht	Lecturer: Transport Planning	082 685 6039	10/03/17	Face to face meeting
University of Stellenbosch	Professor Marion Sinclair	Head of Division: Geotech, Management and Transportation Department of Civil Engineering	021 808 3838	28/03/2017	Face to face meeting
University of Cape Town	Professor Rodger Behrens	Associate Professor - Centre for Transport Studies; Department of Civil Engineering; University of Cape Town	021 650 4757	30/03/2017	Teleconference