Gauteng Province

HOUSEHOLD TRAVEL SURVEY REPORT

2019/20

GAUTENG PROVINCE
ROADS AND TRANSPORT
REPUBLIC OF SOUTH AFRICA

CSIR
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GAUTENG PROVINCE
HOUSEHOLD TRAVEL SURVEY REPORT
2019/20

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FOREWORD

The 2019/20 Gauteng Household Travel Survey (GHTS) reports on the results of household interviews related to travel and mobility patterns in Gauteng province. The analysis reveals valuable insights to inform government on how best to manage, plan and provide transport infrastructure and services. The current report is third in a series of survey reports carried out by the provincial government.

The 2019/20 GHTS was targeted at a random stratified sample of 37 000 households (29 779 in 2014), distributed across metropolitan and district municipalities. The survey resulted in a weighted total number of households of 4 951 138 (3 910 754 in 2014).

The datasets comprised information relating to (i) households, (ii) persons in households, (iii) trips undertaken by individuals in households, and (iv) individual attitudes towards public transport service delivery. For analysis purposes, and consistency with the presentation of the previous results, the format of the report has remained largely unaltered.

The report is published at a time the country is facing unprecedented challenges associated with the outbreak of the 2019 Novel Corona Virus (Covid-19), which was declared by the World Health Organization (WHO) as a pandemic on the 11th of March 2020. The Covid-19 outbreak and the swift response by government to minimise its rapid spread through the declaration of a state of disaster, implemented through national lockdown regulations, have resulted in altered mobility patterns.

The altered mobility patterns may persist for extended periods, and would indeed deviate from measurements made through the household travel survey. The province is in a fortunate position to have carried out the 2019/20 household travel survey just before the Covid-19 outbreak. The results of the survey provide a reliable baseline to help estimate the impact of the outbreak with certainty. The survey results also help with the efforts of the three spheres of government and partners to prioritise and target relief interventions. Therefore, the province will continue to use the results of the 2019/20 GHTS together with other supplementary surveys to direct the efforts of government to improve transport service delivery. In this regard, the province will also continue to embrace many of the opportunities presented by the fourth industrial revolution to improve the speed and quality of transport service delivery.

SUMMARY OF KEY FINDINGS

The changes in travel patterns over the years are reflective of an ever-changing society. Mobility is becoming more complex and increasingly challenges traditional transport planning paradigms.

The table following summarises some of the key and notable findings from the 2019/20 GHTS. For each finding, some notable implications are also provided. The findings are elaborated on in the body of the report.

All indications are that transport service delivery is being overwhelmed by changing travel behaviour. Personalised travel needs are on the increase. These appear to be fuelled by reduced household sizes. Settlement patterns do not seem to be taking advantage of higher capacity public transport infrastructure and services, evidenced by the increased use of lower capacity transport modes. Nonetheless, walking remains a very important means of travel. Consequently, the provision of non-motorised transport infrastructure remains critically important.

Intra-municipal travel remains high, which in turn requires municipalities to continue to invest in transport planning and management capabilities. Inter-municipal travel is also significant, requiring the province to invest in capabilities that will enable integrated transport service delivery across municipalities. The east-west corridor in the province (Ekurhuleni-Johannesburg-West Rand) remains a mobility anchor, and would need be prioritised for inter-municipal transport integration purposes.

Dimension	*Finding*	*Implications*
Trip making	*Walking remains the predominant mode of travel. Over 29% of trips in the peak periods take place through walking all the way.*	*The delivery of non-motorised transport infrastructure is critical for improved transport service delivery.*
	Walking time to access the first public transport service has increased from 9 minutes in 2014 to 14 minutes in 2019/20. For the same period, accessing the final destination from a public transport service also increased from 8 minutes to 14 minutes. Accessing of train services takes the longest.	*The provision of non-motorised transport infrastructure around public transport nodes is critical. Also, the provision of feeder services for trains in particular, is becoming critically important.*
	Motorised travel continues to be catered for by low capacity modes such as private vehicles and minibus taxis. Minibus taxis account for 23% of all peak-period trips and private cars for over 22%. Higher capacity trains and buses account for about 5% of peak-period trips. Households do not use higher capacity travel modes because these are not available, are infrequent and generally inaccessible for the trips being made.	*Spatial planning and settlement patterns in the province are not taking advantage of high capacity public transport modes. Also, the frequency and density of higher capacity public transport modes should be continuously reviewed to respond to changing travel patterns.*

Dimension	Finding	Implications
	In contrast to the 2014 household travel survey that showed that the corridor between Ekurhuleni and Johannesburg has the largest trip density across municipalities, in 2019/20 the corridor between the West Rand and the City of Johannesburg (COJ) emerged as the largest. However, the east-west corridor in Gauteng remains dominant.	*The east-west axis across the province should be prioritised for high capacity transport infrastructure and services.*
	Intra-municipal travel (travel within municipalities) remains high at close to 90%.	*While planning for inter-municipal travel is important, transport planning and management within municipalities remain critically important.*
Travel time	*Average commuting times have increased over the past 20 years. On a typical working day travel time increased by 17% from 46 minutes in 2014 to 57 minutes in 2019/20. Overall, average travel time over the past 18 years has almost doubled. Associated with this, many more commuters choose to travel either earlier or later to avoid the peak. Travel times are particularly high for public transport trips and have deteriorated markedly for buses.*	*Much more investment is required to increase the capacity of the transport system, particularly higher capacity public transport infrastructure and services.*
Household structure and composition	*Average age in households continues to drop, with large proportions of people in the categories 21-25 and 26-30 age groups.*	*Younger populations are associated with higher levels of mobility. Furthermore, transport services should be increasingly responsive to younger people.*
	Average household size is increasingly getting lower, from about 2.9 in 2014 to 2.0 in 2019/20.	*Absolute number of trips per household would be relatively low. The reduced household size could be attributable to increased rates of immigration to Gauteng.*
	The proportion of households without an employed person has increased markedly over the years.	*There is increased demand for affordable transport services.*
	The number of persons per household working the typical 5 days a week decreased from 68.7% in	*Revenue generation potential of public transport is decreasing.*

Dimension	Finding	Implications
	2014 to 62.5% in 2019/20, in favour of fewer days per week.	
	Increasingly more households in the province have at least one member with a driving licence. Households without a licence decreased from over 50% in 2000 to just over 46% in 2019/20. Nonetheless, the proportion of households without access to a vehicle/car has increased to over 70% in 2019/20 from 66% in 2014.	*Demand for personalised travel is on the increase. However, households are still dependent on public transport.*
Cost of transport	*The proportion of household income spent on public transport has increased. Nearly 60% of households spent more than 10% of their income on public transport in 2019, up from 55% in 2014.*	*Transport continues to contribute significantly to the increased cost of living.*
Accessible transport	*The most predominant form of disability reported was in the form of the use of crutches at 24% of persons reported with some form of disability.*	*The design of transport infrastructure and services to cater for various forms of disabilities remains important.*
Satisfaction with public transport services	*Households are more satisfied than dissatisfied with bus and train services. Dissatisfaction relates more to issues of accessibility. On the other hand, households tend to be more dissatisfied than satisfied with minibus taxis, particularly relating to safety and security. Increasingly, households also tend to be dissatisfied about the reduced off-peak services of minibus taxis.*	*For public transport to be car-competitive, more than ever, much more investment is required to improve user experiences.*

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ABBREVIATIONS AND ACRONYMS

- *CBD   - Central Business District*
- *CoE   - City of Ekurhuleni*
- *CoJ   - City of Johannesburg*
- *CoT   - City of Tshwane*
- *CS 2016   - Community Survey 2016*
- *CSIR   - Council for Scientific and Industrial Research*
- *DF   - Dwelling Frame*
- *eNATIS   - Electronic National Administration Traffic Information System*
- *GDRT   - Gauteng Department of Roads and Transport*
- *GHTS   - Gauteng Household Travel Survey*
- *GTS 2000   - Gauteng Household Travel Survey 2002 (initiated in 2000)*
- *GTA   - Gauteng Transport Authority*
- *GPS   - Geographic Positioning System*
- *GTI   - GeoTerraImage*
- *HTSs   - Household Travel Surveys*
- *IDP   - Integrated Development Plans*
- *IPTN   - Integrated Public Transport Network*
- *ITP   - Integrated Transport Plan*
- *NHTS   - National Household Travel Survey*
- *NLTA   - National Land Transport Act*
- *PCA   - Project Steering Committee*
- *PTNS   - Public Transport Network & Systems*
- *SDM   - Sedibeng District Municipality*
- *TAZs   - Transport Analysis Zones*
- *WRDM   - West Rand District Municipality*
- *WHO   - World Health Organisation*

1 BACKGROUND

The 2018/19 Gauteng Household Travel Survey (GHTS) is a province-wide primary data collection project that aimed to collect and analyse information about household travel patterns, in order to provide improved understanding of the interaction between households and transport service delivery. The GHTS is one of a series of provincial household travel surveys commissioned by the Gauteng Department of Roads and Transport (GDRT) as part of fulfilling its legislative mandate requiring the province to continuously monitor and evaluate its transport system.

The first provincial household travel survey in the post-apartheid dispensation was carried out in 2000, followed by a 2014 survey. The household travel survey data have over the years functioned as critical inputs to strategic transport planning. The GHTS is necessary to support evidence-based decision-making.

The establishment of the Transport Authority for Gauteng (GTA), which seeks to promote integrated transport planning in the province, also recognises the need for evidence-led planning. A province-wide GHTS, led by the provincial government, seeks to correct problems of data quality experienced in 2014, where individual municipalities in the province carried out their own surveys. This resulted in compromised comparisons between municipalities, as well as poor representation of inter-municipal travel data.

The report adopts the formatting style of the previous household travel surveys (HTSs). However, where municipal names have changed, for example Kungwini and Dinokeng Tsa Taemane, these have been effected.

2 PROJECT PRINCIPLES AND OBJECTIVES

2.1 Implementation principles

National transport policy and legislation require that planning undertaken by authorities must be supported by sufficient, updated and good quality information that can become a core point of reference to benchmark and support decision-making processes. In seeking to facilitate comparable understanding and interpretation of the 2019 results to the 2014 GHTS, the statistics and reporting follow a similar structure where practical, to that adopted in 2014.

Fundamentally, the following set of principles served as a basis for the implementation of the project:

- The Council for Scientific and Industrial Research (CSIR), as implementation agent, oversees and coordinates all critical project activities and takes steps to ensure that data collection and analysis pursued is subjected to accepted levels of quality, ethical integrity and scientific robustness.
- Preserves a comparable approach, i.e. survey instruments, transport zoning system and survey methodology used in previous studies.
- The CSIR engages and collaborates with Gauteng municipalities to ensure consistency, ease of interpreting and integrating survey datasets for locality/region-specific investigations.

2.2 Project objectives

Comparable to historical Household Travel Surveys (HTSs), the 2019/20 GHTS aims to understand the general travel patterns of households and individuals, including their respective predominant motives and methods of travel.

Insights into travel experiences and perceptions, particularly around the public transport system, offer a decision-support tool for authorities and planners to maximise the effectiveness and targeting of mobility reform initiatives. The outcome of the GHTS provides a vital understanding of general mobility patterns at a household level, while achieving the following broad objectives:

a) *Derive a continuous comparison to the 2014 GHTS patterns.*
b) *Support authorities to undertake better and improved integrated public transport planning.*
c) *Facilitate continuous update of strategic transport models.*
d) *Enable measurement of Gauteng's transport system's performance against set standards.*

2.3 Project team

Table 1: Project team

Organisation	Team members	Role in the project
Gauteng Department of Roads and Transport	*Project Manager: Integrated Planning*	*Client*
Council for Scientific and Industrial Research	*Project manager, statisticians and sampling specialists, transport planners, transport economists, civil engineers, IT specialists*	*Implementation agent*
Caireg, Kuhle Solutions, and Spatial Intelligence	*Survey specialist, fieldwork manager, fieldwork coordinator, fieldworkers*	*Overall field support provided by subcontracted firms*
Project Steering Committee	*Municipal officials in Sedibeng, West Rand, Johannesburg, Ekurhuleni and Tshwane GDRT officials*	*Joint oversight, field work and community engagement facilitation*

2.4 Study area

To enable consistency and maintain compatibility to the structure and presentation of the 2014 GHTS, the province was divided into sub-regions and coded accordingly. The location and demarcation of the municipalities were determined using a spatial layer of the Gauteng province boundary to disaggregate survey regions as:

a) *CoE*
b) *CoJ*
c) *SDM*
d) *CoT*
e) *WRDM*
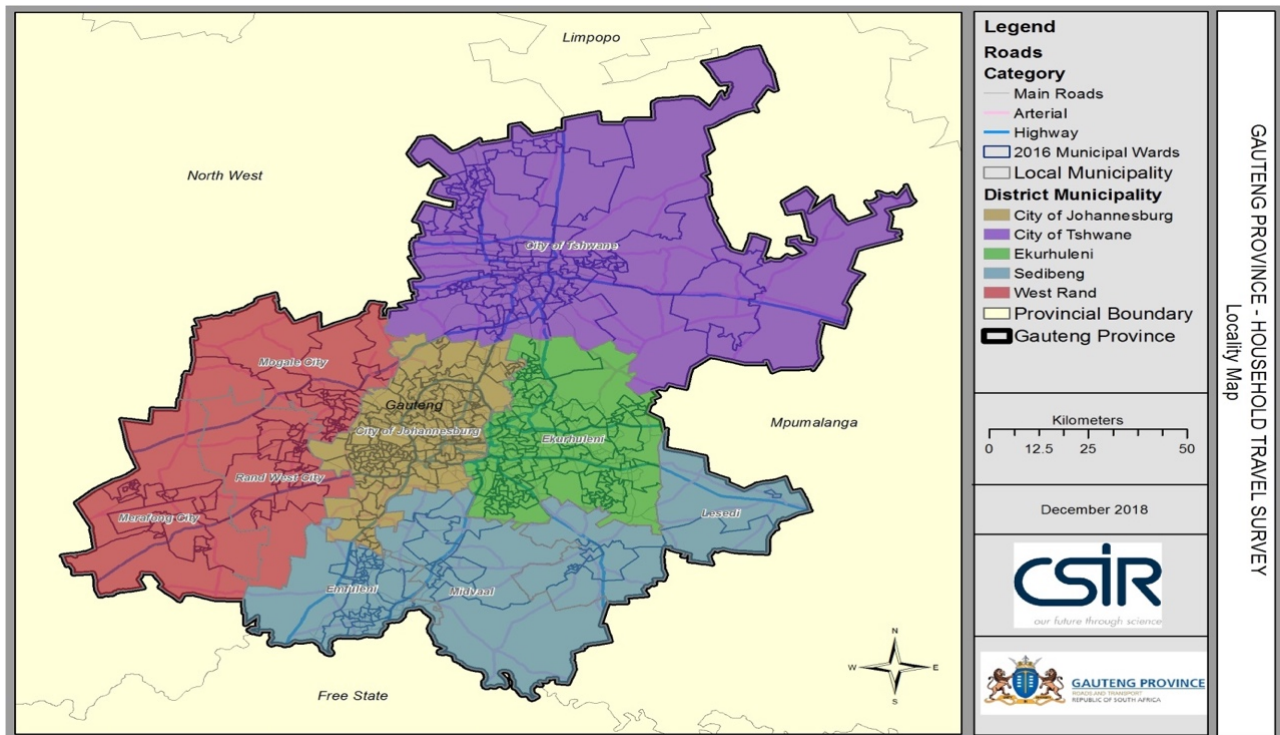
Figure 1: Survey regions in the Gauteng province

The survey regions were assigned unique identifier codes to enable both spatial aggregation and disaggregation of region- and province-specific analysis and contextualisation. The survey data were developed and prepared as a valuable input towards integrated development and transport planning processes.

3 SAMPLING METHODOLOGY, INCLUSIONS AND EXCLUSIONS

3.1 Dwelling frame

One of the fundamental frameworks required to undertake a general HTS is a dwelling frame. This is a spatially referenced framework of all structures (residential and non-residential) in South Africa and it facilitates the generation of a representative sample size of a given population for investigation. The dwelling frame guides the processes and approaches adopted to sourcing datasets relevant to aid drawing of an appropriate sample for participation in household interviews. In this instance, the development of the dwelling frame involved the use of a variety of secondary data sources that mainly consisted of:

a) GeoTerraImage (GTI) Dwelling Points 2010
b) GeoTerraImage (GTI) Dwelling Points 2018
c) Census 2011 Number of Households
d) Gauteng Provincial Boundary.

An update of the 2011 residential growth per small area layer (SAL) was required to ensure that the correct sample size was deduced from each SAL, as illustrated in
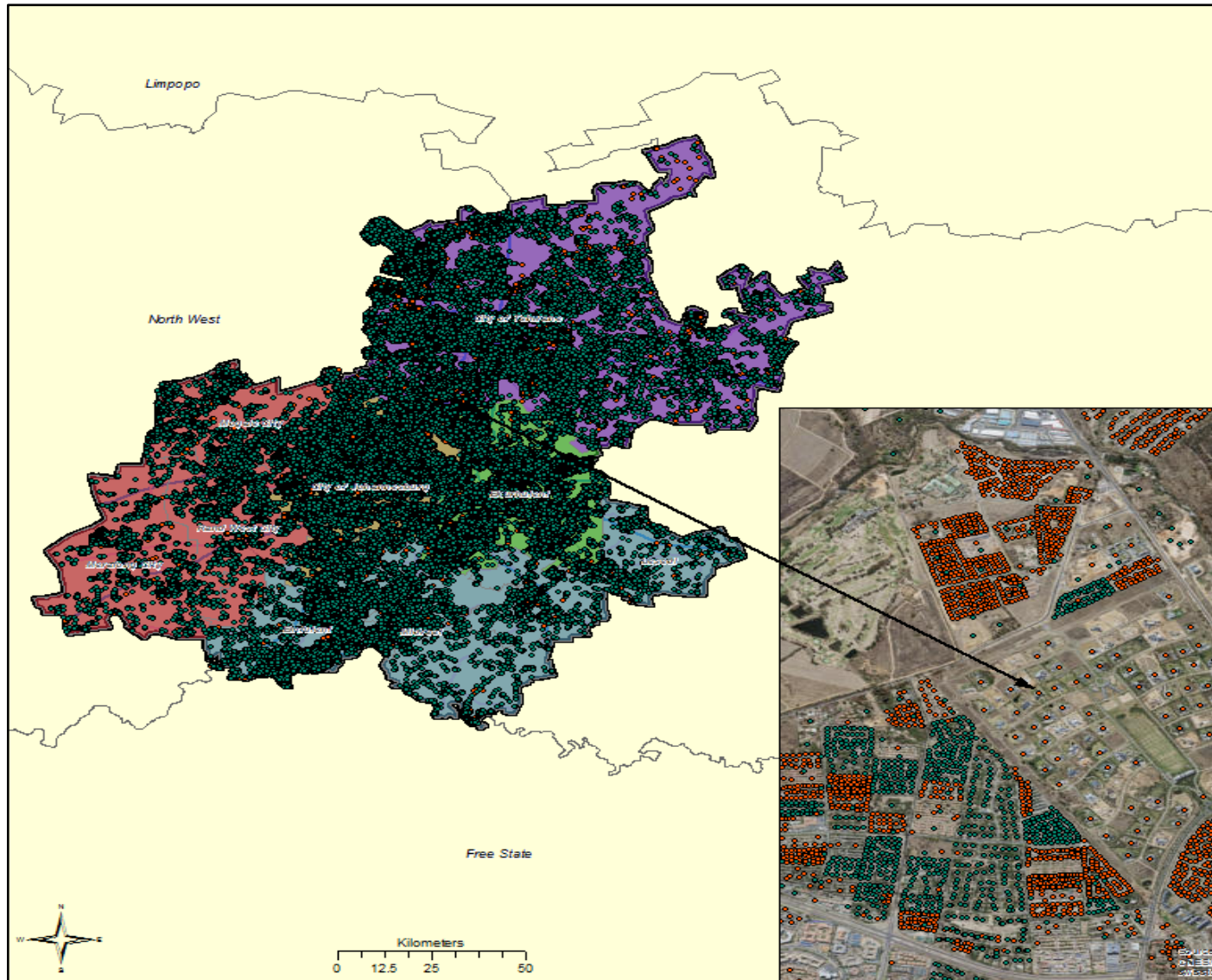
Figure 2. The 2018 GTI dwelling coordinate points were used to identify new development areas that have occurred over time since 2011; and in combination with the Census 2011 and the 2016 Community Survey, the potential increase in total population and number of households per SAL was determined.

The dwelling points were assigned to spatial layers from which they are located using (1) Main places, (2) Sub-places, (3) Wards and Transport Analysis Zones (TAZs) as levels of reporting. A sampling frame (see Figure 2) with the earlier mentioned spatial variables, including GPS coordinates and exact street addresses for multi units, was produced. The output was both in a shapefile layer and database format. The GTI[1] building counts for both 2011 and 2018 were acquired from secondary sources to guide the representation of all structures in Gauteng. The data were gathered as a building-based land use point dataset. GTI datasets were useful to enhance the robustness of the sampling method.

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[1] GTI is a database or catalogue that categorises the built environment in relation to settlements into 70 different type of structures in South Africa, identifying every structure according to a set of comprehensive land use definitions (see appendices). The residential points sub-dataset for main buildings, further disaggregated into 17 tertiary classes (see Table 44), were selected to form the basis of the survey sampling frame development.

3.1 Exclusions

Public institutions were eliminated from the sample due to the nature of travel patterns generated by such facilities. These included a) retirement villages/old-age homes, b) student hostels, c) orphanages, children's homes, and places of safety, and d) correctional services (warden housing – cluster).

The travel patterns of demographics from public institutions were defined as out of scope because they contain persons who are not part of the conceptual basis for transport planning and modelling. The definition of the target population was not only limited to public institutions but also included a) ethical concerns of interviewing people younger than 18 years, b) not collecting information about any household member younger than six years and c) a temporal dimension in that a person to be categorised as living in a household must have spent four consecutive nights in the same household.

3.2 Sample size

Statistical judgements made in the 2000 and 2014 surveys informed the decision to undertake a total sample size of about 37 000 Gauteng households in the 2019/20 survey. This sample was distributed across the three metropolitan municipalities as well as the two district municipalities (including their local municipalities) as shown in Table 2.

*Table 2: Distribution of the sample size by municipality_*

Municipality		Sample size
City of Ekurhuleni Metropolitan		8 000
City of Johannesburg Metropolitan		9 000
City of Tshwane Metropolitan		8 000
Sedibeng District:		6 000
• Emfuleni Local	4 741	
• Lesedi Local	665	
• Midvaal Local	594	
West Rand District:		6 000
• Merafong City Local	1 613	
• Mogale City Local	2 470	
• Rand West City Local	1 917	
Total		37 000
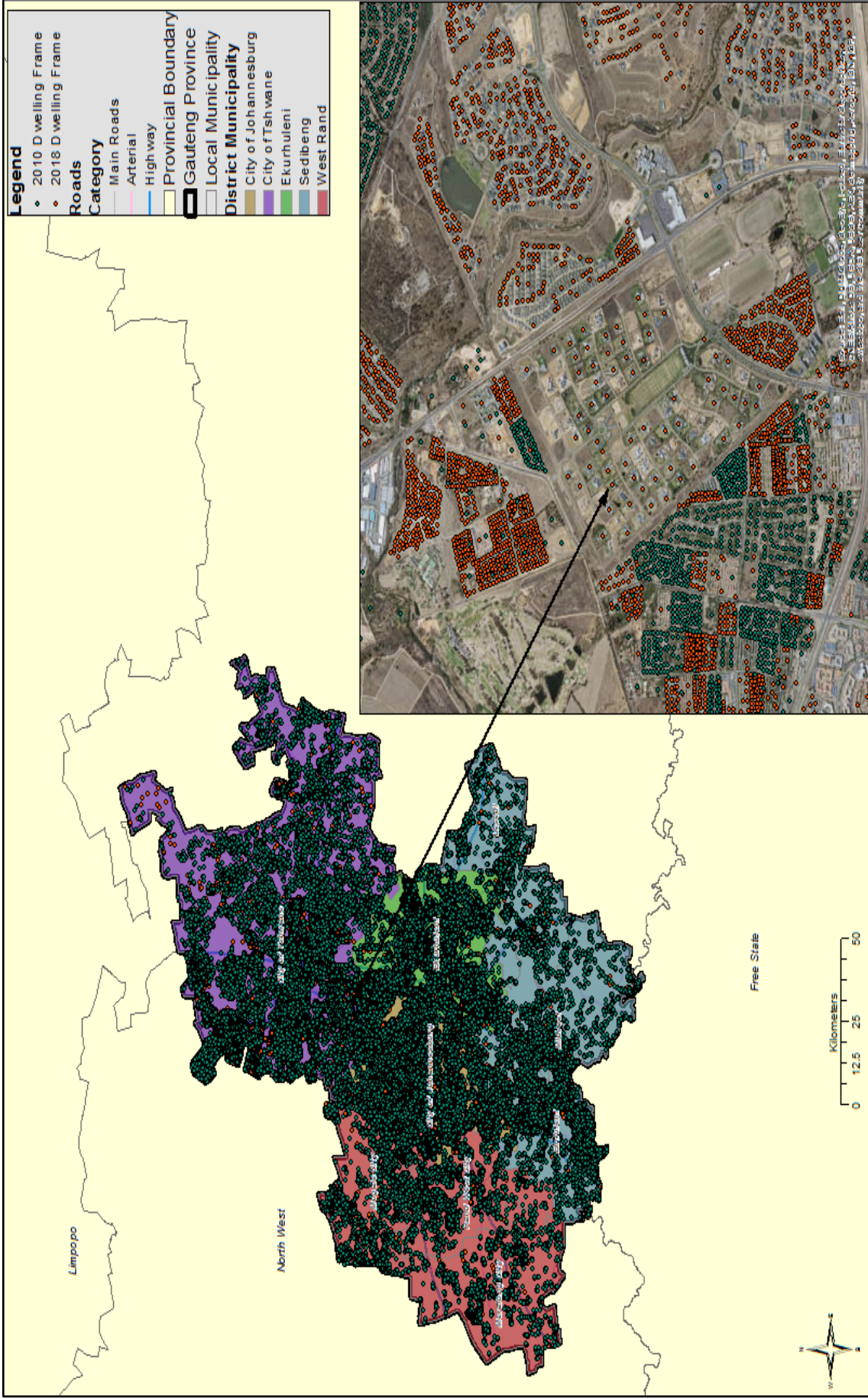
Figure 2: Dwelling points growth over an eight-year period (Year 2010 Green Points–Year 2018 Red Points)

The largest proportion (9 000) of the households in the sample were to be selected from the City of Johannesburg (CoJ) metro, while the City of Tshwane (CoT) and Ekurhuleni (CoE) metros had an equal share of 8 000 households needed from each metro. Sedibeng and West Rand District municipalities each had about 6 000 households (further split by the relevant local municipalities) to visit during fieldwork.

3.3 Sampling approach

In statistical theory and application, two main sampling strategies have been developed for use in survey methods. These involve probability and non-probability sampling procedures. The former method is about random selection of study subjects from a relevant population; whereas the latter method is about the selection of elements from a population using non-random methods, in this manner, limiting generalisability of the sample characteristics to the larger study population.

The 2019 GHTS adopted the probability sampling method as the ideal approach that can better support an investigation into general commuting patterns at a household level. This method ensured that each element of a population had an equal and known (quantifiable) chance of being selected into the sample, and thus enabled generalisation of the attributes of a sample to a larger study population. The selection of samples, i.e. pilot and principal, was conducted exclusively (with the exception of replacement samples) to eliminate the likelihood of visiting a dwelling more than once.

3.4 Sample design and selection

The sampling frame discussed was the basis to implement the sampling strategy adopted. The design consisted of the most recent (2018) database of residential dwelling units of various types with relevant spatial resolutions such as sub-places, main places, TAZs, municipalities and wards. Each dwelling unit was utilised as a proxy for a household and a visiting point for data collection from each of the municipalities.

3.5 Selection of the main sample

The selection of a sample of dwelling units was executed via a multi-stage process. The first stage involved proportional random selection of the required number of dwelling units, as presented in Table 44, via stratification by TAZ and main place to allow for adequate coverage at these spatial units.

3.5.1 Multiple dwelling units

A selected list of dwelling units (drawn in the first step) was evaluated to identify and isolate 'multiple-dwelling' units from individual 'single-dwelling' units. Multiple-dwelling units were those units that represented a group of dwelling units, such as clustered residential units within complexes, flats, security estates and villages.

The proportion of multiple-dwelling units, approximately 20%, was obtained from each of the sampled multiple-dwelling units. The proportion (20%) selected represented the number of units required from the multiple-dwelling units. The number of such multiple-dwelling units was then deducted from the municipal-level totals to determine the final number of single dwelling units [e.g. CoJ: 9 000 – 20% from multiple-dwelling units]. From the subset of single-dwelling units, the determined number was randomly chosen. Both the single- and multiple-dwelling units were combined to provide the required sample size for each municipality.

3.5.2 Sample distribution by dwelling structure

Table 3 presents a summary distribution of the number of dwelling units of different categories between the sampling frame and the main sample. Included in the sampling frame for selection were residential dwelling units shown in Table 44. *These consisted of stand-alone formal and informal housing structures, formal structures in cluster, complex or security estate living; agricultural and small-holdings.*

Table 3: Number and percentage distribution of residential dwelling units

Type of dwelling unit	Sampling frame		Survey sample	
	Total no. of dwelling units	Percent of dwelling units	Sample of dwelling units	Percent of sample
Formal	1 595 800	48.5%	17 535	47
Informal	1 509 956	45.9%	16 065	43
Cluster/complexes	26 688	0.8%	1 446	4
Estates	27 852	0.8%	344	1
Security villages	66 701	2.0%	634	2
Smallholdings / agriculture	46 375	1.4%	674	2
Rural workers' housing	16 802	0.5%	302	1
Total	**3 290 174**	**100.0%**	**37 000**	**100**

3.5.3 Sample distribution overlaid to dwelling frame 2018

Figure 3 illustrates the sample distribution overlaid to a geographically referenced dwelling frame consisting of all recorded households in Gauteng. These structures are represented by geographically coded coordinate points for ease of visualisation. The dwelling frame for 2018 was overlaid with the sampled points to ensure and enable sampling to, as much as possible, maintain adequate representability of demographics and population. Geographic information system (GIS) tools were used to manipulate, manage and spatially map out the sampled residential structures.

3.6 Weighting

A stratified sampling approach encompassing a proportional allocation sample across areas (census main places and TAZs) was implemented for random selection of households based on the dwelling frame developed. This selection consisted of assigning sampling weights to each of the households. The weights were computed to improve the estimation of relevant population parameters and enable inferences to be deduced from the sampled households to represent the Gauteng population as well as to correct for possible sample bias.

3.7 Substitutions

An additional sample to accommodate for both single- and multiple-dwelling units was drawn to allow for possible replacement or substitution of non-responsive dwelling units. Substitution was implemented as a contingency in instances where selected participants/households became inaccessible for a range of reasons, including partial and refusal to partake, no one at home etc., to compensate for non-response and to preserve the sample size required. A substitution list was generated consisting of approximately 40% of the sample in each region.
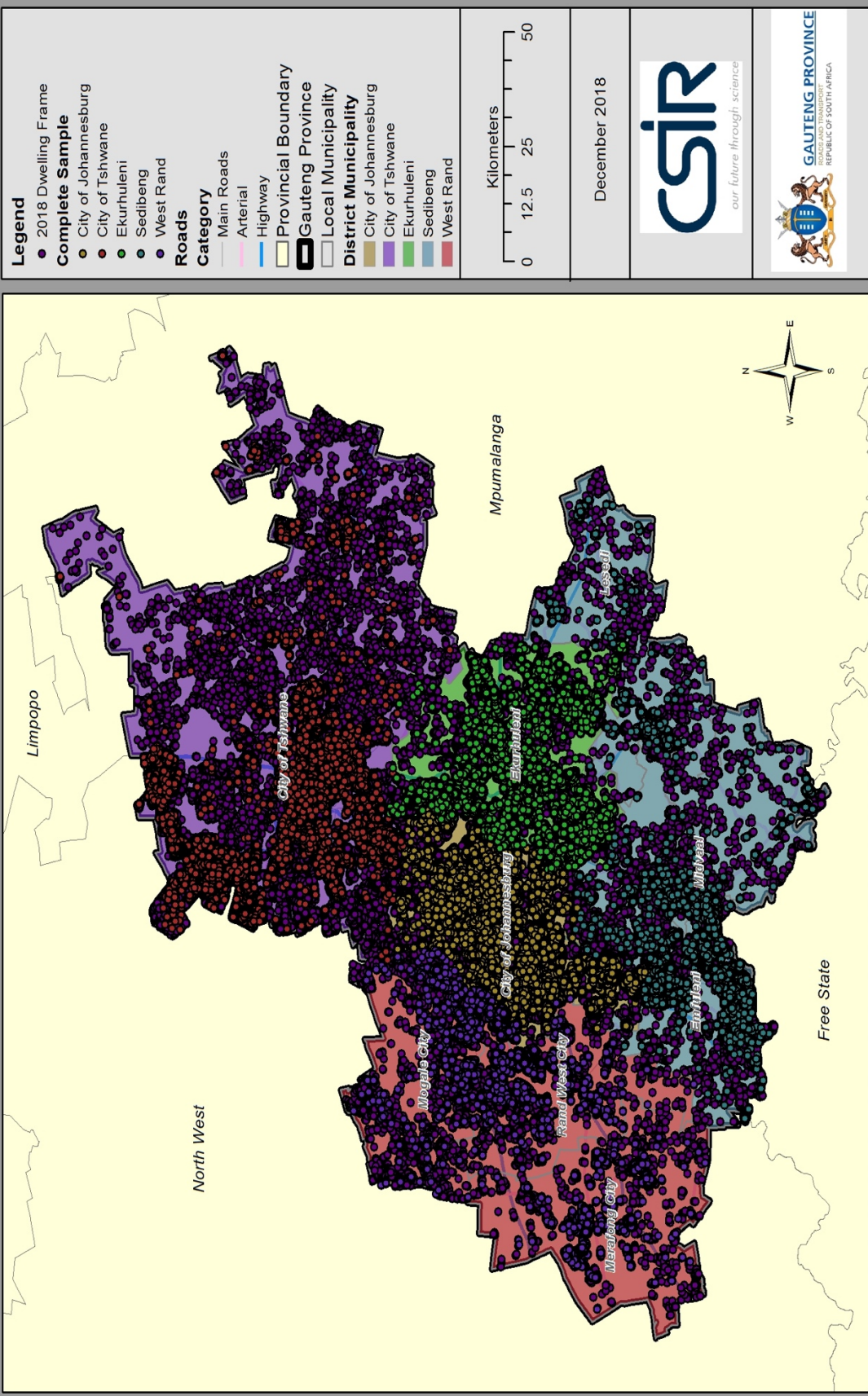
Figure 3: Dwelling frame: A distribution of the dwelling points across the five survey regions

4 FIELD WORK IMPLEMENTATION

4.1 Pilot survey sample

Pilot survey interviews were conducted at a small-scale and formed part of the preliminary investigation. The pilot survey was conducted primarily to facilitate the understanding of the practicality of the survey methodology adopted, survey instruments, network coverage issues to support digital collection, and resources required to successfully complete the main field project timeously. A similar sampling approach applied in the selection of the main sample was adopted to select the pilot scope. The pilot constituted 10% (about 3 700 dwelling units) of the main sample and was allocated across sub-regions in Gauteng.

The training of field teams (enumerators and supervisors) was executed and pilot projects implemented. The results of the pre-testing exercise provided valuable insights into several potential challenges that might be encountered during the field survey administration. The pilot results were subsequently used as basis to conduct further training.

4.2 Principal survey sample

A decision to investigate a total sample size of 37 000 Gauteng households was based on statistical judgements deduced from observations in the past HTSs across national, metropolitan, district and provincial spheres. The CoJ was allocated the largest proportion (9 000) of households in the sample, while the CoT and CoE had an equal share of 8 000 households each. Sedibeng and West Rand districts were allocated an equal share of a combined total of 12 000 households.
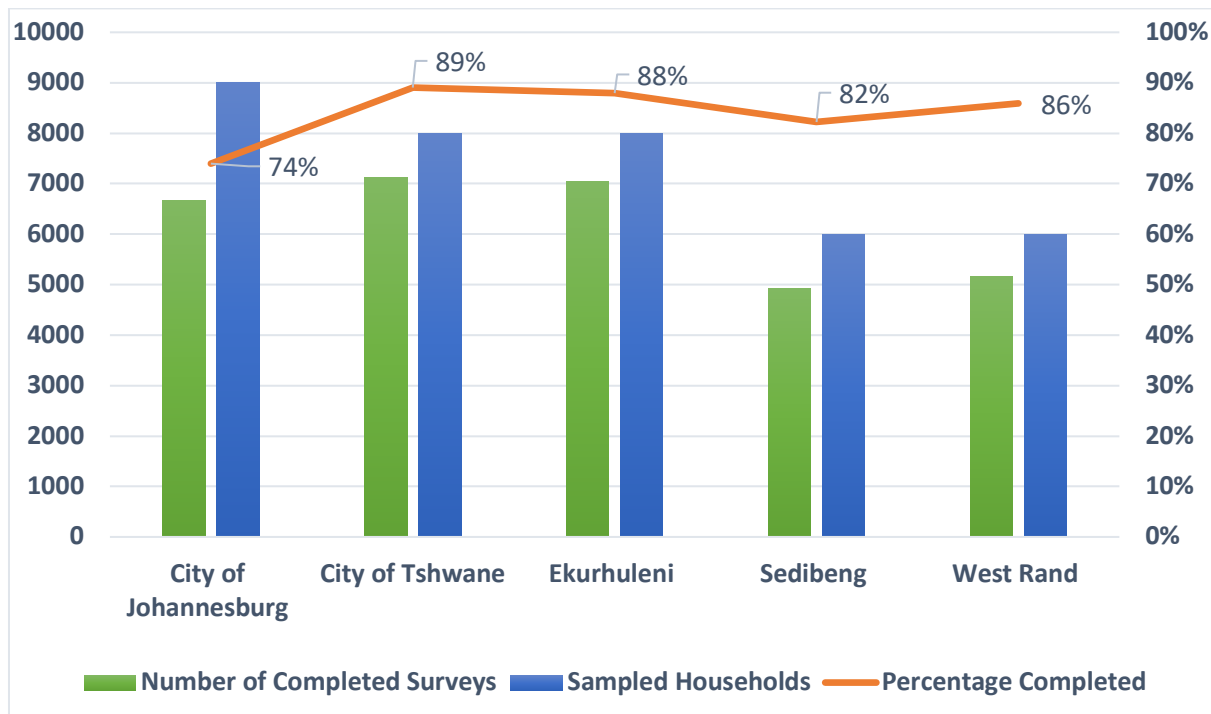
Figure 4: Field survey execution

Figure 4 presents a summary of the overall survey response rate. From a total of 37 000 households distributed across all regions within Gauteng province, a 83.5% overall response rate was achieved during the field surveys as illustrated by the line curve. The graph shows response rate against sample size and deductively, the CoT achieved the highest response rate of nearly 90%, followed by the CoE which recorded a response rate of about 88%. The district municipalities of the West Rand and Sedibeng recorded the third- and fourth-ranked response rate, whereas the CoJ achieved the lowest response rate of approximately 74% due to survey execution constraints. These constraints are briefly discussed in the next section.

4.3 Survey method

The survey interviews to collect information were based on the widely applied Computer-Assisted Personal Interviews method in which the interviewer uses a tablet to record answers given during the interview. A suitable adult member of the household was required to consent to participating in interviews and providing responses on behalf of all applicable members of the household. Elderly people unable to participate and child-headed households were excluded from the study. Travel or trips executed on behalf of or involving minors younger than six years of age were not considered during the study.

Household visits were executed from Wednesday to Sunday. Interviews gauged the travel patterns of each member of the household over the age of six years undertaken between normal travel periods, i.e. Tuesday to Thursday. In instances of inaccessibility, a household was expected to be visited three times at different times of the day, before that dwelling could qualify to be replaced by another household in the same region.

4.4 Survey challenges

Disruptions of trip patterns caused by school and other holidays resulted in delayed fieldwork on a number of occasions during the implementation. The June and September school break coupled with the Easter holiday and the National and Provincial Elections that occurred around April and May of 2018 are typical examples of challenges encountered. Additional challenges common to executing household interviews relate to enumeration fatigue, unavailability of a household and refusal to participate (both partial or complete). In this study, similar challenges were encountered and these are briefly discussed next.

4.4.1 Technological

Lack of sufficient mobile network GPS coverage for some network providers in other parts of Gauteng presented challenges to executing field activities. The use of mobile networks was required to enable navigation of enumeration teams to selected visiting points; however, coverage in remote areas was characterised by poor network signal. Most of the low to medium specification mobile devices were found to be problematic in executing digital data collection. High-end specification devices using advanced network efficiency resolved the connectivity challenges.

4.4.2 Replacements

The CSIR-adopted protocol to gain access in gated communities and complexes determined two important aspects, namely a) permission to access such communities was required prior to field visits and appreciating that, b) permission was not guaranteed, in which case a substitution dwelling was necessary. The substitution of multiple-dwelling units in instances where access was not achieved posed significant challenges and delays to field work activities. Frequently, body corporates (property

management agencies) would deny enumerators access citing a variety of reasons for refusals, thus making it impractical to undertake enumeration without consent from the property managers of the sampled gated population.

The range of dwelling units between various gated communities differed significantly. It became unlikely that a replacement multiple-dwelling unit would be of similar size to that which it was meant to replace. Where questionnaires were found to be incomplete, a replacement sample was allocated to substitute the incomplete questionnaire. In certain instances, replacement was difficult to pursue and a compromise scenario was agreed on. A compromise entailed a mutual agreement between the CSIR and field specialists (subcontractor) to no longer substitute inaccessible households that refuse to participate partially or completely and to record such datasets as a 'non-response'.

4.4.3 Stakeholder engagement

The implementation of surveys was significantly influenced by the endorsement of field work. Therefore, political and administrative protocols were acknowledged and complied with where practical. This endorsement was critical to improving and heightening safety and visibility concerns of field workers and communities. Stakeholder engagements were difficult to implement in the absence of municipal representation in the Project Steering Committee to facilitate communication of important project details to ward councillors, communities, stakeholders etc.

4.4.4 Civil Actions

The GHTS 2019 survey phase coincided with the May 2019 National Presidential Elections and this period was characterised by intense political campaigning which negatively impacted on the field work schedule. Due to elections, people refused to allow enumeration to take place as they perceived the GHTS to be a political campaign.

A number of violent and volatile communities in various parts of Gauteng were encountered which presented considerable safety and efficiency challenges, including hostile working conditions for field workers. Data collection in these areas had to be halted on numerous occasions and in some instance, a substitution sample was used to enable continuation of interviews. Similar problems were encountered in some remote and underprivileged areas, but the conditions were not comparable across regions as the South African Police, ward councillors and municipal officials were able to intervene and facilitate safe deployment of field activities. However, these engagements were lengthier than anticipated in most instances and invariably had a negative impact on the project timeframes.

4.4.5 Data quality control

Household questionnaire validation and verification tools were developed to assist the geo-referencing of visiting points and to maintain control of where interviews were undertaken in the field. These tools enabled the data management team to detect possible and probable discrepancies in the field, for example, correlating enumeration points to enumerator location when completing or interviewing suitable members within different households.

The analysis of individual trip information was an extremely tedious and challenging task. The interview trip data required a combination of automation and manual data cleaning methods to enable correction and conversion, where practical, of text descriptions from discrete destination responses, i.e. geocoding of destination addresses to a GIS-compatible format (coordinates).

4.4.6 Weighting and analysis

Due to the partial execution of the planned sample, the design weights were not applicable during the analysis since these were calculated in proportion to the overall sample. Further, to compensate for a smaller number of households than the required sample sizes being visited in certain areas, particularly those along the major transport corridors, a decision was made to include the pilot data into the main survey.

A pilot sample of approximately 3 700 households had been selected in each stratum prior to conducting the main survey and about 31 311 questionnaires were fully completed. Since no changes were made to the questionnaire subsequent to the pilot collection, all the completed pilot surveys contained data which were similar to those collected during the execution of the main survey. Hence, it was possible to incorporate the pilot sample into the main sample for analysis.

As the households selected in the pilot phase had design weights that differed from the design weights of the main survey, and due to the non-responses during the implementation of the main survey, had to be adjusted to apply as base weights in the analysis. Therefore, post-stratification adjustments were built, including using auxiliary data from the 2016 Community Survey (Statistics South Africa, 2016). This survey is one of the largest nationwide surveys conducted between census periods (2011 and the upcoming 2021) to provide updated information on population and household characteristics released at municipal level (lowest administrative dissemination layer).

Therefore, certain variables were adjusted using weights bases on known population estimates (Lavallée and Beaumont, 2015) from Community Survey 2016, while in cases where no such information was available, extrapolation through adjusting the sample results was done. For this task, the estimates were produced using the sampling frame data (e.g. including the total number of households from the lowest spatial resolution [main places or sub regions]) and aggregating the results to desired spatial layers.

The sampling frame contained geographic information from sub-place level, and this information had been updated to include growth areas and recent developments that have occurred since the 2011 census dwelling frame and made use of a variety of data sources to provide the 2018 status quo. Therefore, the analysis contains two sets of results, those weighted by Community Survey 2016 and those extrapolated from the sample of the results to match the current (2018) status.

The results estimated from the sample may be subject to design variance and caution should be paid where sample sizes were small in an area, particularly when assessing statistics at lower spatial levels such as the sub-regions.

5 FINDINGS: HOUSEHOLD CHARACTERISTICS

Table 4 provides a summary of the number of households interviewed and the corresponding weights allocated to achieve adequate representation of household patterns in Gauteng. The 2014 GHTS number of dwelling units estimated in Gauteng was 3 910 754. This is one million less households compared to the 2019 estimates.

Table 4: Number of households and response rates segmented by municipality

	2019 GHTS				*2014 GHTS*	
Region	*Number of households interviewed*	*% households (sample)*	*Weighted number of household*	*% of weighted number of households*	*Weighted number of households*	*% number of households*
City of Johannesburg	*6 722*	*21.47%*	*1 853 371*	*37.4%*	*1 017 965*	*26.0%*
City of Tshwane	*7 057*	*22.54%*	*1 136 877*	*23.0%*	*1 434 856*	*36.7%*
City of Ekurhuleni	*7 213*	*23.04%*	*1 299 490*	*26.2%*	*302 712*	*7.7%*
Sedibeng	*4 989*	*15.93%*	*330 828*	*6.7%*	*900 736*	*23.0%*
West Rand	*5 330*	*17.02%*	*330 572*	*6.7%*	*254 485*	*6.5%*
Gauteng	*31 311*	*100.00%*	*4 951 138*	*100.0%*	*3 910 754*	*100.0%*

Number of households weighted by CS2016

The 2016 Community Survey estimates of the population or household attributes were used to adjust the analysis results for sampling errors, including non-response, as well as to calibrate the sample to the known population estimates; and thus reducing bias of the analysis results.

5.1 Type of dwelling unit

Table 5 provides a summary of dwelling types that were occupied by various households in Gauteng. Standalone brick houses accounted for a significant proportion of dwelling types found in Gauteng at 62% of weighted households in 2019. Shack dwelling ranked second, representing 18% of dwelling types. Comparatively, in 2014, the corresponding spread of standalone brick houses was similar at 62% but slightly different for shack dwelling at 22%.

Table 5: Dwelling type distribution in Gauteng province

Dwelling type	*Number of households (sample)*	*% Households (sample)*	*Weighted number of households*	*% Households*
Stand-alone brick house	*22 636*	*72.3%*	*3 061 523*	*61.8%*
Shack dwelling in settlement	*4325*	*13.8%*	*878 246*	*17.7%*
Formal dwelling/house/flat/room in backyard	*1 905*	*6.1%*	*533 751*	*10.8%*
Townhouse	*948*	*3.0%*	*76 465*	*1.5%*
Flat or apartment in a block of flats	*449*	*1.4%*	*250 052*	*5.1%*
Other	*380*	*1.2%*	*30 268*	*0.6%*
Semi-detached house	*336*	*1.1%*	*34 765*	*0.7%*
Cluster house in a complex	*220*	*0.7%*	*72 513*	*1.5%*
Traditional dwelling/hut	*97*	*0.3%*	*10 763*	*0.2%*
Caravan or Tent	*15*	*0.0%*	*1 861*	*0.0%*
Unspecified	*-*	*-*	*930*	*0.0%*
Total	*31 311*	*100.0%*	*4 951 137*	*100.0%*

Number of households weighted by CS2016

5.2 Number of people per household

Table 7Table 1 illustrates the proportional distribution of household sizes in relation to the weighted responses for 2019. The overall household sizes in Gauteng as described by their median value when compared to 2014 revealed a slight decline of 0.94%, see Table 7 Table 6. The shrinkage in household sizes can be explained by the significant increase in single person households of 7.1% and declines in larger households as exhibited in Table 7.

Table 6: Median number of people per household

Region	Number
City of Johannesburg	*1.9*
City of Tshwane	*2.1*
City of Ekurhuleni	*1.9*
Sedibeng	*2.4*
West Rand	*2.0*
2019 Average	*2.0*
2014 Average	*2.94*

About 82% of the households in Gauteng consisted of four members. This figure is 2% lower when compared to the reported figure in GHTS 2014. The GHTS 2014 figure was 10% higher when compared to the figure reported in GTS 2000, implying that on average, general household size declined during the period between the two household travel surveys.

Table 7: Household size for Gauteng

Number of persons in household	Number of households (sample)	% Households (sample)	Weighted number of persons in household	% Households in 2019	% Households in 2014
1	*11 212*	*35.8%*	*1 394 708*	*28.2%*	*21.1%*
2	*9 909*	*31.6%*	*1 099 806*	*22.2%*	*26.3%*
3	*6 035*	*19.3%*	*837 321*	*16.9%*	*20.9%*
4	*2 648*	*8.5%*	*711 345*	*14.4%*	*15.2%*
5	*939*	*3.0%*	*428 461*	*8.7%*	*8.8%*
6	*542*	*1.7%*	*225 727*	*4.6%*	*4.0%*
7	*10*	*0.0%*	*114 167*	*2.3%*	*1.8%*
8	*9*	*0.0%*	*61 051*	*1.2%*	*1.0%*
9	*4*	*0.0%*	*34 790*	*0.7%*	*0.4%*
10	*3*	*0.0%*	*43 760*	*0.9%*	*0.5%*
Total	*31 311*	*100.0%*	*4 951 136*	*100.0%*	*100%*

Number of households weighted by CS2016

5.3 Household income

The income distribution of households in Gauteng is aggregated to the sampled households using the weighted number of households to enable adequate representation of a provincial picture, as illustrated in Table 8. In 2019, only 70% of participating households were able to provide some detail in relation to

household earnings, a decline of 9% when compared to 2014. Accordingly, 21% of the respondents in 2014 were not comfortable giving out information relating to person and household income compared to 30% in 2019. The low response rate could be attributable to a) negative perceptions of disclosing sensitive information, b) crime sensitivity, and c) inaccessibility to most gated communities.

Table 8: General household income distribution

Income distribution	Number of households (sample)	Weighted number of households	% Households	2014 GHTS % (rounded off)
Nothing	527	83 333	1.7%	1%
R1 - R200	97	15 338	0.3%	1%
R201 - R500	964	152 435	3.1%	4%
R501 - R1000	1 624	256 799	5.2%	6%
R1001 - R1500	2 407	380 613	7.7%	11%
R1501 - R2500	3 797	600 411	12.1%	11%
R2501 - R3500	2 483	392 631	7.9%	9%
R3501 - R4500	2 222	351 360	7.1%	8%
R4501 - R6000	2 060	325 743	6.6%	7%
R6001 - R8000	1 744	275 775	5.6%	6%
R8001 - R11 000	1 437	227 230	4.6%	5%
R11 001 - R16 000	1 192	188 488	3.8%	4%
R16 001 - R30 000	976	154 333	3.1%	4%
R30 001 or More	468	74 004	1.5%	3%
Don't know	1 894	299 494	6.0%	6%
Refuse to answer	7 419	1 173 150	23.7%	14%
Total	**31 311**	**4 951 137**	**100.0%**	100%

Number of households weighted by CS2016

Table 9 presents the median monthly household income by sub-region. The median household income in Gauteng in 2019 was R4 543, which is 25 percentage points lower than the average monthly household income of R5 767 reported in 2014 and higher than the reported figure of R3 247 in 2000.

Table 9: Household income by sub-region

Municipality	Sub-regions	Number of households	%	Median monthly income (Rands)
City of Johannesburg	Alexandra / Modderfontein	85 877	1.60%	3 556
	Diepmeadow	236 243	4.40%	2 625
	Diepsloot	94 425	1.80%	2 589
	Joburg Central	100 224	1.90%	3 376
	Joburg South	93 205	1.70%	7 667
	Midrand	197 435	3.70%	2 674
	Northcliff / Rosebank	98 858	1.80%	5 501
	Orange Farm / Ennerdale	210 861	3.90%	2 527
	Roodepoort	127 713	2.40%	3 353
	Sandton / Randburg	190 398	3.50%	5 101
	Soweto / Doornkop	343 898	6.40%	4 461

	Akasia / Rosslyn	23 675	0.40%	8 001
	Centurion	124 988	2.30%	6 114
	Bronkhorstspruit Rural East	26 348	0.50%	2 951
	Bronkhorstspruit Rural West	23 350	0.40%	11 601
	Bronkhorstspruit Urban (Bronkhorstspruit core, Zithobeni)	15 246	0.30%	3 501
	Mamelodi / Nellmapius	208 445	3.90%	2 651
	Moot	49 936	0.90%	6 188
	Cullinan Rural	51 777	1.00%	2 541
	Cullinan Urban (Cullinan / Rayton)	48 971	0.90%	2 708
City of Tshwane	Pretoria central business district (CBD)	42 909	0.80%	5 001
	Pretoria East	125 468	2.30%	8 704
	Pretoria North	37 902	0.70%	20 286
	Pretoria West / Atteridgeville	119 615	2.20%	3 647
	Rooiwal	35 155	0.70%	1 347
	Soshanguve	209 450	3.90%	2 628
	Temba, Winterveld, Mabopane, Ga-rankuwa	236 059	4.40%	2 666
	Tshwane West Rural	14 761	0.30%	4 701
	Alberton	42 218	0.80%	6 215
	Brakpan / Benoni / Springs	120 744	2.30%	3 811
	Daveyton	81 171	1.50%	2 676
	Ekurhuleni Rural	86 749	1.60%	4 322
Ekurhuleni	Germiston / Boksburg	189 984	3.50%	5 476
	Katorus	299 022	5.60%	2 324
	Kempton Park / JIA / Boksburg North	218 393	4.10%	6 001
	Kwatsaduza	180 994	3.40%	2 868
	Tembisa / Clayville	189 449	3.50%	2 714
	Emfuleni LM Rural	9 007	0.20%	9 001
	Emfuleni LM Urban (Evaton, VdBP, Vereeniging)	288 005	5.40%	2 162
Sedibeng	Lesedi LM Rural	32 203	0.60%	1 834
	Lesedi LM Urban (Heidelberg / Ratanda)	17 119	0.30%	3 001
	Midvaal LM Rural East	31 911	0.60%	7 667
	Midvaal LM Rural West	27 446	0.50%	3 448
	Merafong LM	86 620	1.60%	2 673
	Mogale City LM Rural	48 048	0.90%	2 521
West Rand	Mogale City LM Urban (Krugersdorp / Kagiso)	126 737	2.40%	3 381
	Randfontein LM Rural	7 228	0.10%	3 084
	Randfontein LM Urban	53 799	1.00%	4 865
	Westonaria LM	54 057	1.00%	3 916
		5 364 096	**100%**	**4 543**

Number of households from CSIR Frame (number of HH in 2018)

5.4 Car accessibility by income

Table 10 shows the relationship between household income and household car access. Car accessibility showed to have a positive and significant correlation with household income. This correlation implies that, on average, households with an income of at least R11 000 would typically be expected to start owning a vehicle. The estimated number of accessible cars per household for such income groups is generally greater than or equal to one.

Table 10: Car ownership by income and average car ownership per household

Income range	2019					2014		
	Weighted number of HH	Weighted number of households with car access	% of households with access to a car	Average number of cars per household	Weighted estimated number of cars	% of households with access to a car	Average number of cars per household	Estimated number of cars in group
Nothing	83 333	44 955	17%	0.32	33 296	10%	0.13	6 973
R1 - R200	15 338	2 020	4%	0.22	4 089	4%	0.05	1 229
R201 - R500	152 435	18 689	4%	0.13	23 560	4%	0.05	7 435
R501 - R1000	256 799	59 098	7%	0.19	59 387	9%	0.12	29 839
R1001 - R1500	380 613	151 534	12%	0.26	123 837	10%	0.13	59 132
R1501 - R2500	600 411	287 410	15%	0.30	219 051	15%	0.18	76 527
R2501 - R3500	392 631	239 930	19%	0.35	167 647	17%	0.20	69 789
R3501 - R4500	351 360	276 803	25%	0.43	184 003	21%	0.26	79 340
R4501 - R6000	325 743	326 809	31%	0.48	191 402	32%	0.39	105 704
R6001 - R8000	275 775	385 403	44%	0.67	228 787	40%	0.51	117 678
R8001 - R11 000	227 230	416 215	57%	0.90	251 763	59%	0.80	161 292
R11 001 - R16 000	188 488	424 297	70%	1.15	265 782	73%	1.04	171 031
R16 001 - R30 000	154 333	379 341	77%	1.41	268 703	85%	1.47	248 319
R30 001 or More	74 004	183 862	78%	1.75	159 664	96%	2.18	228 115
Don't know	299 494	271 752	28%	0.48	178 551	41%	0.60	130 534
Refuse to answer	1 173 150	1 483 018	40%	0.60	860 239	52%	0.83	469 023
Total	4 951 137	4 951 136	33%*	0.60	3 219 761	36%*	0.56*	1 961 960

Number of households weighted by CS2016

*Average percentage of households / average number of cars.

In 2019, the average number of cars per household was about 0.6, and slightly higher than the reported figure in GHTS 2014. Table 10 further shows that 40% of households that refused to disclose income had relatively high car access, which may imply that the attitudes and sensitivity of middle-income households to answer questions on income are heightened. The weighted number of car population in Gauteng is less than the registered vehicle population as registered on the Electronic National Administration Traffic Information System (eNATIS), which stood at 3 400 000 passenger vehicles in 2019.

Table 11: Levels of car ownership

Number of vehicles owned per household	Weighted number of households	% 2019 GHTS	% 2014 GHTS
0	3 474 224	70.2	66%
1	1 091 398	22.0	21%
2	313 093	6.3	9%

3	54 554	1.1	2%
4	17 868	0.4	1%
Total	4 951 137	100.0	100%

Number of households weighted by CS2016

Table 11 shows the estimated distribution of household-owned cars in Gauteng (excluding motorcycles). In 2019, just above 70% of households did not own any car, which is 4% higher than the reported figure in 2014; but 2% lower than the reported figure in GTS 2000. Ownership of one and two cars per household, however, did not exhibit much variation when compared to the 2014 GHTS. Nevertheless, household car ownership of three cars per household was estimated to have declined over the past three GHTS series, from 11.1% in 2000 and 17.1% in 2014.

Table 12: Employer owned vehicles

Number of employer-owned vehicles	Weighted number of households	2019 Percentage employer-owned vehicles	2014 Percentage employer-owned vehicles
0	4 858 632	98.1%	95.5%
1	80 013	1.6%	3.8%
2	6 483	0.1%	0.5%
3	2 214	0.1%	0.1%
4	3 795	0.1%	0.1%
Total	4 951 137	100.0%	100.0%

Number of households weighted by CS2016

Table 12 illustrates the distribution of households with employer-owned cars. In 2019, just above 98% of households did not have access to an employer-owned vehicle compared to about 96% reported in GHTS 2014. Negative changes in overall country employment and economic growth rate over the past 10 years can be attributable to declines in employer-related mobility benefits.

Selected participating households were asked to reveal if any member(s) of their households above 18 years of age had a driver's licence. Data show that

Table 13 shows that in 2019 just above 46% of the households in Gauteng had no member with a driver's licence. This pattern exhibited a strong decrease of 10% from the reported figure in 2014 and a moderate decline of 4% from the 2000 GTS.

Table 13: Driving licences

Number of licensed drivers in households	Number of households (sample)	Weighted number of households	% licensed drivers in households	% (GHTS 2014)	% (GTS 2000)
0	14 539	2 299 019	46.4	56	50.1
1	12 312	1 946 868	39.3	28	26.0
2	3 543	560 247	11.3	13	17.9
3	659	104 206	2.1	3	4.2
4+	258	40 797	0.8	1	1.8
Total	31 311	4 951 137	100.0%	100%	100.00%

Number of households weighted by CS2016

Table 14: Spatial distribution of car ownership and driver quality per sub-region

Municipality	Sub-region	Number of household	% Household with car access	Average car access per household	Average number of licensed drivers
City of Johannesburg	Alexandra / Modderfontein	85 877	1.6%	0.33	0.14
	Diepmeadow	236 243	4.4%	0.21	0.14
	Diepsloot	94 425	1.8%	0.16	0.06
	Joburg Central	100 224	1.9%	0.35	0.12
	Joburg South	93 205	1.7%	0.76	0.19
	Midrand	197 435	3.7%	0.28	0.13
	Northcliff / Rosebank	98 858	1.8%	0.74	0.19
	Orange Farm / Ennerdale	210 861	3.9%	0.40	0.11
	Roodepoort	127 713	2.4%	0.43	0.14
	Sandton / Randburg	190 398	3.5%	0.51	0.18
	Soweto / Doornkop	343 898	6.4%	0.40	0.13
City of Tshwane	Akasia / Rosslyn	23 675	0.4%	0.70	0.27
	Centurion	124 988	2.3%	0.91	0.2
	Bronkhorstspruit Rural East	26 348	0.5%	0.30	0.13
	Bronkhorstspruit Rural West	23 350	0.4%	1.37	0.3
	Bronkhorstspruit Urban (Bronkhorstspruit core, Zithobeni)	15 246	0.3%	0.58	0.12
	Mamelodi / Nellmapius	208 445	3.9%	0.28	0.12
	Moot	49 936	0.9%	0.74	0.24
	Cullinan Rural	51 777	1.0%	0.52	0.14
	Cullinan Urban (Cullinan / Rayton)	48 971	0.9%	0.43	0.16
	Pretoria CBD	42 909	0.8%	0.80	0.18
	Pretoria East	125 468	2.3%	1.03	0.25
	Pretoria North	37 902	0.7%	1.32	0.29
	Pretoria West / Atteridgeville	119 615	2.2%	0.50	0.11
	Rooiwal	35 155	0.7%	0.28	0.07
	Soshanguve	209 450	3.9%	0.35	0.12
	Temba, Winterveld, Mabopane, Ga-rankuwa	236 059	4.4%	0.29	0.12
	Tshwane West Rural	14 761	0.3%	0.82	0.21
Ekurhuleni	Alberton	42 218	0.8%	0.78	0.18
	Brakpan / Benoni / Springs	120 744	2.3%	0.44	0.13
	Daveyton	81 171	1.5%	0.25	0.15
	Ekurhuleni Rural	86 749	1.6%	0.43	0.15
	Germiston / Boksburg	189 984	3.5%	0.52	0.14
	Katorus	299 022	5.6%	0.33	0.12
	Kempton Park / JIA / Boksburg North	218 393	4.1%	0.63	0.2
	Kwatsaduza	180 994	3.4%	0.31	0.1
	Tembisa / Clayville	189 449	3.5%	0.52	0.21
Sedibeng	Emfuleni LM Rural	9 007	0.2%	1.30	0.17

Municipality	Sub-region	Number of household	% Household with car access	Average car access per household	Average number of licensed drivers
	Emfuleni LM Urban (Evaton, VdBP, Vereeniging)	288 005	5.4%	0.33	0.09
	Lesedi LM Rural	32 203	0.6%	0.31	0.07
	Lesedi LM Urban (Heidelberg / Ratanda)	17 119	0.3%	0.39	0.08
	Midvaal LM Rural East	31 911	0.6%	1.19	0.2
	Midvaal LM Rural West	27 446	0.5%	0.52	0.14
	Merafong LM	86 620	1.6%	0.43	0.12
	Mogale City LM Rural	48 048	0.9%	0.46	0.11
	Mogale City LM Urban (Krugersdorp / Kagiso)	126 737	2.4%	0.45	0.14
	Randfontein LM Rural	7 228	0.1%	0.32	0.07
	Randfontein LM Urban	53 799	1.0%	0.58	0.12
	Westonaria LM	54 057	1.0%	0.34	0.1
		5 364 096	100.0%	0.54	0.15

Number of households from CSIR Frame (number of HH in 2018)

At an aggregate, the average number of households with access to a car and households with at least one person in possession of a driver's licence amounts to 0.54 and 0.15, respectively. The value of 0.54 implies that half of the households in Gauteng would be expected to have at least access to a car and this is consistent with the 2014 GHTS results. However, at this level (sub-region), estimation of the number of people with licences was not possible given that no recent population size estimates were available at the time of analysis.

Therefore, a decision was made to estimate driver licences at household level instead of at person level. Caution should be exercised in this analysis since some of the areas (hostile townships and inaccessibility of suburban areas in Johannesburg, Midrand and some extent, Ekurhuleni and Tshwane) had very few households visited, some even had only one household visited and that means the data represent the rest of households in an area and not much variability is captured in such areas.
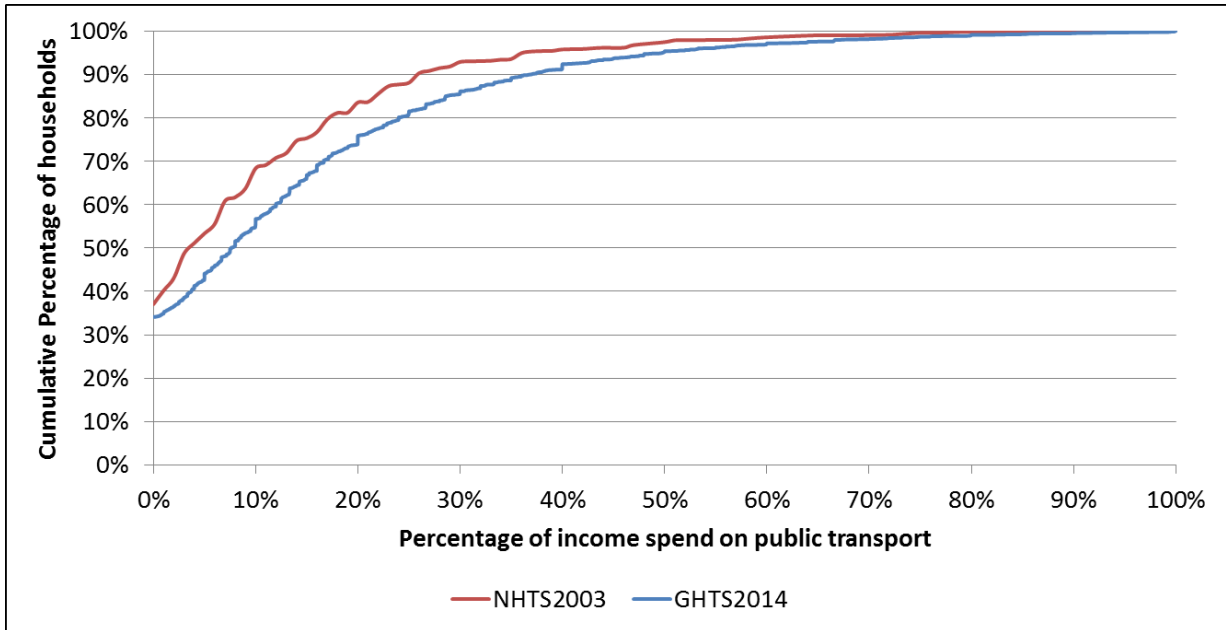
Figure 5: Commuter household expenditure on transport (2003 NHTS, 2014 GHTS)

The cumulative graph for commuter household expenditure in past HTSs is exhibited in Figure 5. In Gauteng, the 2014 GHTS was estimated to be 55% of commuter household spending, 10% or less on public transport, and this was 10% of the national average of 65% of households. In the 2019 GHTS, the district municipalities exhibited a relatively higher average compared to the metros, as illustrated in Figure 6.
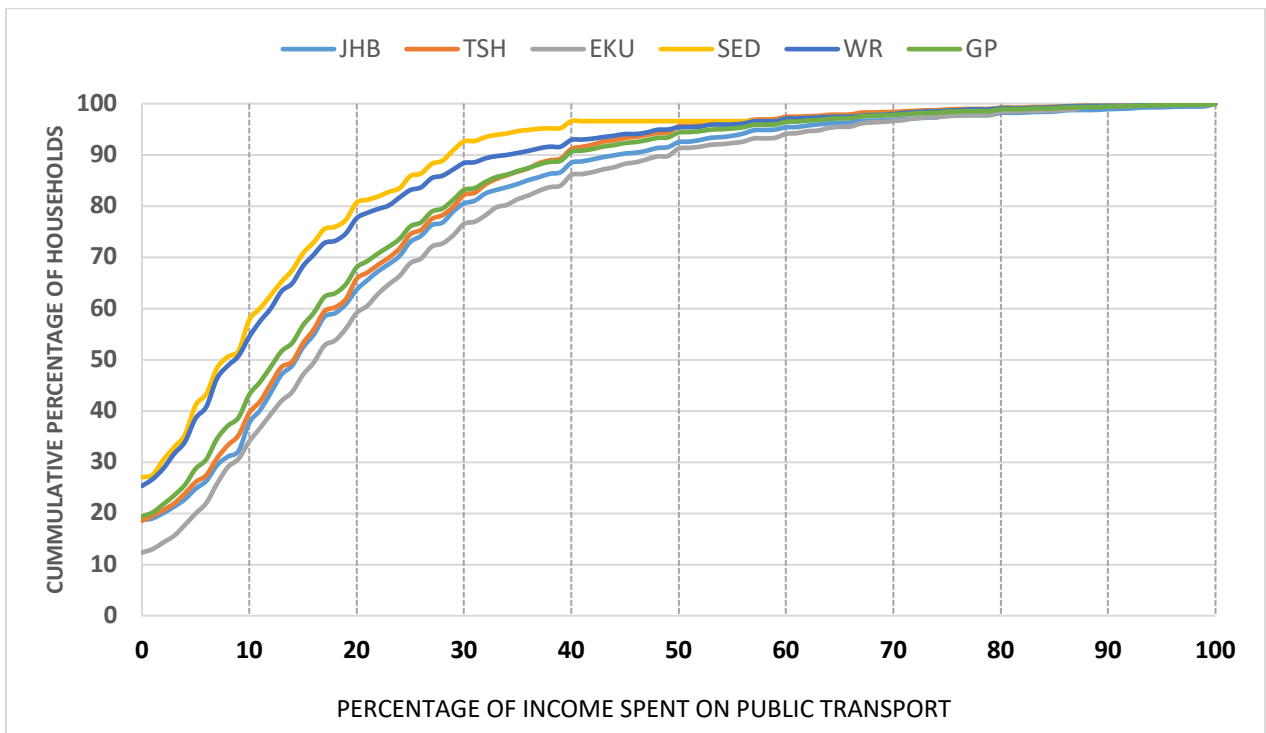
Figure 6: Cumulative general household expenditure on public transport

Figure 6 shows that a significant number of commuter households in the district municipalities of West Rand and Sedibeng (60%) spend 10% or less of their income on public transport. The district municipalities' level of cumulative expenditure is 17% higher than the Gauteng province average of 43%

of households. Nonetheless, Gauteng commuter households' spending of about 10% or less of their income on public transport in 2019 was lower than the reported figures in 2003 and 2014 of 70% and 55%, respectively; thus representing a strong decline of 12% from the 2014 report. Indicatively, commuting household expenditure on public transport has shown a substantial decline of 27% from the 2003 NHTS.

Expectedly, the metropolitan municipalities of Tshwane, Johannesburg and Ekurhuleni showed that relatively fewer commuter households are spending less on public transport. It was estimated that 40%, 38% and 34% of the respective populations spend more than 10% of disposable income on public transport.

The decline from the reported figures in 2014 revealed that households' spending on commuter transport is increasing, albeit with the exception of district municipalities. The dominance of minibus taxi services and private car ownership in addition to the presence of mass mobility systems such as trains, bus, bus rapid transit etc. in mode choice for commuting in metros, might explain the reduction in cumulative expenditure on public transport, particularly in cities.

6   FINDINGS: POPULATION CHARACTERISTICS

Figure 7: Regional gender and population distribution in Gauteng shows the weighted results for the different regions. At an aggregate, gender parity in Gauteng depicts male to be estimated at 55% while female accounts for 45% of gender in 2019. This gender split is also apparent in the 2016 Community Survey. However, it was found to differ slightly to the reported figures in the 2014 GHTS with a 50/50 split. Tshwane and Sedibeng had the least number of female proportional split at roughly 43% of the municipal population.
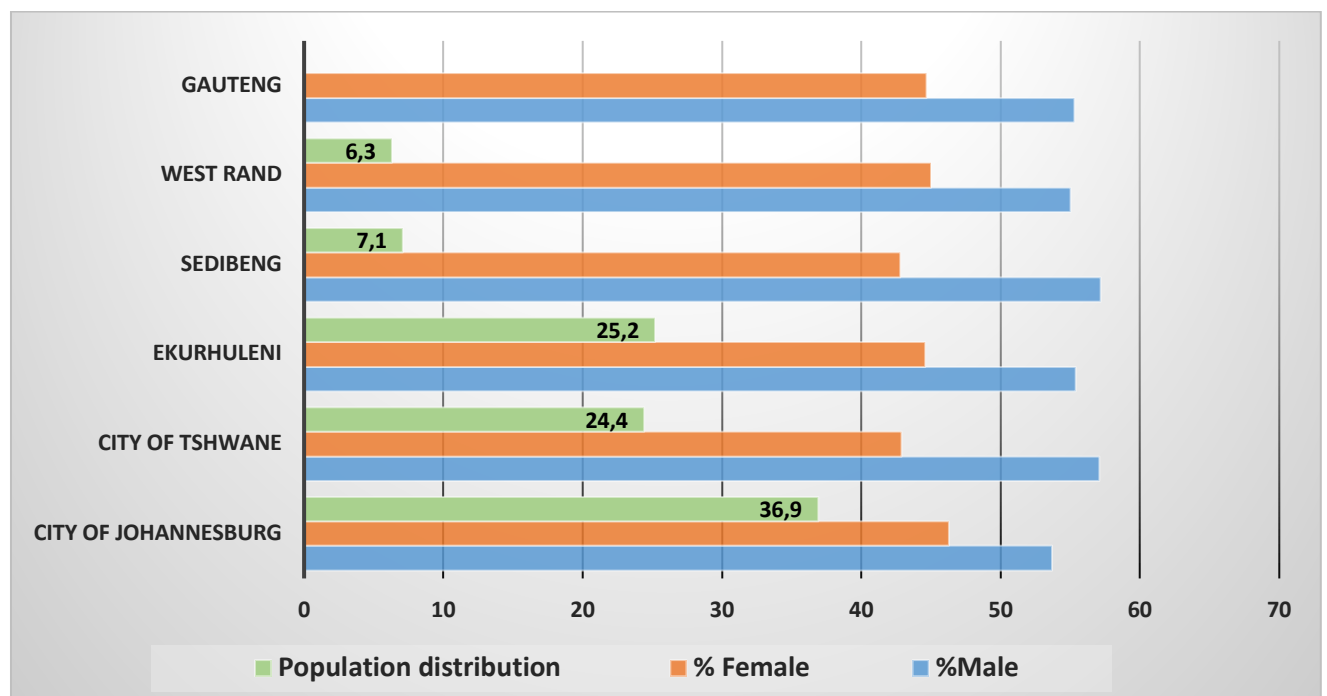
Figure 7: Regional gender and population distribution in Gauteng

A substantial number of people are concentrated in Johannesburg and accounted for 37% of the provincial population. Ekurhuleni and Tshwane typically are comparable in population size and have a

proportional distribution of 25% and 24%, respectively; whereas Sedibeng and the West Rand shared the remaining distribution, collectively accounting for 13% of the population.

Table 15: Demographic distribution

	Black/African	White	Coloured	Indian/Asian	Gauteng
City of Johannesburg	80.5	9.8	5.3	4.4	36.9
City of Tshwane	79.1	17.4	1.9	1.6	24.4
City of Ekurhuleni	81.7	13.7	2.5	2.0	25.2
Sedibeng	80.8	16.9	1.3	1.0	7.1
West Rand	78.7	17.7	2.5	1.1	6.3
Gauteng	80.4	13.6	3.3	2.7	

Table 15 shows the population group distribution in Gauteng in 2019. According to the weighted survey results, the number of black persons represented about 80% of the provincial population and increased slightly by 2% from the reported 2014 GHTS. White persons accounted for about 14%, while Asians/Indians and coloured persons together accounted for the remaining 6% of total population.

Table 16: Age distribution and population size

Age group (years)	Population size	% Population size
0 - 6	1 686 273	12.6
7-17	2 163 619	16.1
18 - 25	1 850 949	13.8
26 - 65	7 025 341	52.4
65+	673 542	5.0
Total	*13 399 724*	*100*

Number of people in Gauteng as per CS2016

Table 16 shows the age distribution in Gauteng in 2019 when the weighted population for the province was 13 399 724 people, which translated into just 1.1 million more people than the figure of 12 254 771 in GHTS 2014. The 1.1 million increase in population over a five-year period since 2014 suggests an annual population growth rate of 2%, similar to the average population growth rate of 2% reported in GHTS 2014.
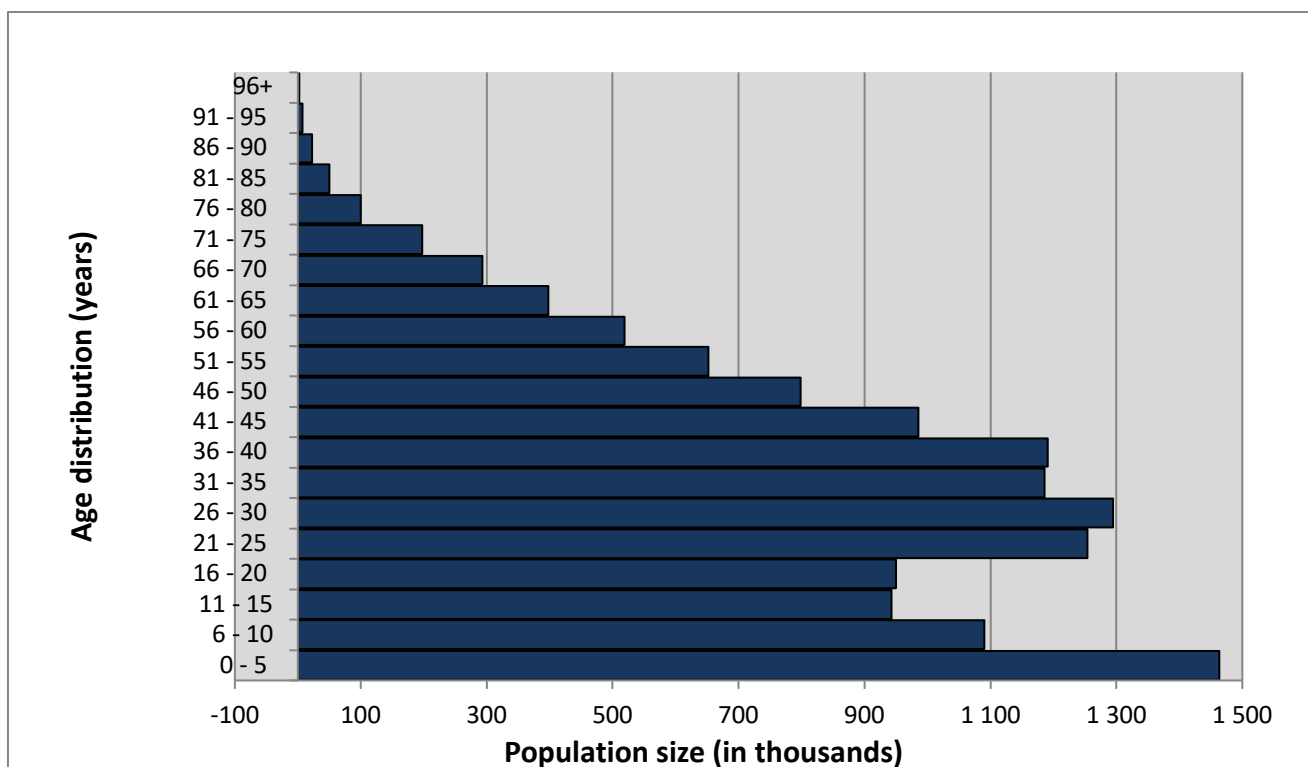
Figure 8: Population age distribution

Figure 8 depicts the age distribution for the province of Gauteng in 2019. As it was reported in 2014, there are a large proportion of people in the age ranges of 21–25 and 26–30 in 2019. As expected, the highest age range was found in the age group of 0–5.

Table 17 shows the distribution of the number of employed persons per household in 2019. The figures presented in the zero category of Table 17 include the number of households with part-time employed people. Therefore, the zero number of full-time employed people in Table 17, should not be interpreted as unemployment. In comparison to GTS 2000 and GHTS 2014, the proportion of households without a single full-time employed person increased from 29% to 45% between 2000 and 2014, to just above 57% in 2019. The observed increase in household unemployment invariably impacts on the level of trip making at a household level and this phenomenon tends to induce an adverse effect on household trip generation rates.

Table 17: Number of full-time employed persons per household

Number of full-time employed per household	Number of households	Weighted number of households	% (GHTS2019)	% (GHTS2014)	% (GTS2000)
0	19 937	2 863 764	57.8%	45.4%	29.0%
1	9 821	1 737 249	35.1%	40.4%	44.5%
2	1 404	310 771	6.3%	12.1%	19.9%
3	122	29 237	0.6%	1.7%	5.0%
4+	27	10 115	0.2%	0.4%	1.6%
Total	31 311	4 951 137	100.0%	100.0%	100.0%

Number of households from CSIR Frame (number of HH in 2018)

Table 18 illustrates the distribution of employment across the provincial sub-regions and aggregated to maintain compatibility to the structure of the 2014 GHTS in reporting on spatial distribution of employment. Overall, the average ratio of employment to unemployment exhibited a 54:46 percentage split.

Table 18: Employment by sub-region

Municipality	Sub region	Number of households	% Employed	% Unemployed
City of Johannesburg	Alexandra / Modderfontein	85 877	54%	46%
	Diepmeadow	236 243	47%	53%
	Diepsloot	94 425	47%	53%
	Joburg Central	100 224	51%	49%
	Joburg South	93 205	68%	32%
	Midrand	197 435	41%	59%
	Northcliff / Rosebank	98 858	61%	39%
	Orange Farm / Ennerdale	210 861	45%	55%
	Roodepoort	127 713	52%	48%
	Sandton / Randburg	190 398	68%	32%
	Soweto / Doornkop	343 898	52%	48%
City of Tshwane	Akasia / Rosslyn	23 675	52%	48%
	Centurion	124 988	45%	55%
	Bronkhorstspruit Rural East	26 348	31%	69%
	Bronkhorstspruit Rural West	23 350	56%	44%
	Bronkhorstspruit Urban (Bronkhorstspruit core, Zithobeni)	15 246	51%	49%
	Mamelodi / Nellmapius	208 445	39%	61%
	Moot	49 936	52%	48%
	Cullinan Rural	51 777	39%	61%
	Cullinan Urban (Cullinan / Rayton)	48 971	23%	77%
	Pretoria CBD	42 909	25%	75%
	Pretoria East	125 468	62%	38%
	Pretoria North	37 902	68%	32%
	Pretoria West / Atteridgeville	119 615	36%	64%
	Rooiwal	35 155	39%	61%
	Soshanguve	209 450	43%	57%
	Temba, Winterveld, Mabopane, Ga-rankuwa	236 059	36%	64%
	Tshwane West Rural	14 761	44%	56%
Ekurhuleni	Alberton	42 218	61%	39%
	Brakpan / Benoni / Springs	120 744	37%	63%
	Daveyton	81 171	24%	76%
	Ekurhuleni Rural	86 749	38%	62%
	Germiston / Boksburg	189 984	56%	44%
	Katorus	299 022	35%	65%

Municipality	Sub region	Number of households	% Employed	% Unemployed
	Kempton Park / JIA / Boksburg North	218 393	55%	45%
	Kwatsaduza	180 994	43%	57%
	Tembisa / Clayville	189 449	42%	58%
Sedibeng	Emfuleni LM Rural	9 007	7%	93%
	Emfuleni LM Urban (Evaton, VdBP, Vereeniging)	288 005	38%	62%
	Lesedi LM Rural	32 203	36%	64%
	Lesedi LM Urban (Heidelberg / Ratanda)	17 119	40%	60%
	Midvaal LM Rural East	31 911	74%	26%
	Midvaal LM Rural West	27 446	57%	43%
West Rand	Merafong LM	86 620	48%	52%
	Mogale City LM Rural	48 048	40%	60%
	Mogale City LM Urban (Krugersdorp / Kagiso)	126 737	45%	55%
	Randfontein LM Rural	7 228	57%	43%
	Randfontein LM Urban	53 799	46%	54%
	Westonaria LM	54 057	49%	51%
	Total	**5 364 096**	**54%**	**46%**

Number of households from CSIR Frame (number of HH in 2018)

Evidently, the density of employment is higher in identifiable parts of the province and similarly with unemployment. For instance, high employment areas with more than 60% employment in the CoJ included the Sandton/Randburg, Northcliff/Rosebank sub-regions; in Tshwane, the Pretoria East/Pretoria North sub-region; Alberton sub-region in Ekurhuleni; and Midvaal Rural East sub-region in Sedibeng.

The areas most affected by unemployment are distributed across Gauteng but more prominently found to be concentrated in rural parts of the province with the exception of the Pretoria CBD and Daveyton.

Table 19 presents Gauteng inhabitants' estimated occupation status in 2019. Just above 22% of people in Gauteng were in full-time employment in 2019, while just above 4% were employed on a part-time basis. The percentage of unemployed people increased to 31% in 2019 translating into an increment of about 10% in unemployment from 2014 GHTS. Expectedly, a reduction in the size of labour force in any economy has a direct relationship to the production and generation of work-related trips executed by households and individuals.

Table 19: Occupational status of Gauteng inhabitants

Occupation Status	Number of persons (sample)	Weighted number of persons	Percentage
Child staying at home	1 585	351 347	2.6%
Full-time worker	13 108	2 905 649	21.7%
Housewife or husband	2 132	472 600	3.5%
Learner high school learner	2 369	525 136	3.9%
Learner pre-school child	355	78 693	0.6%
Learner primary school	2 505	555 283	4.1%
Learner university or college student	1 135	251 595	1.9%
Part-time worker	2 672	592 302	4.4%

Pensioner or retired	6 971	1 545 261	11.5%
Unable to work, handicapped or ill	926	205 266	1.5%
Unemployed, would like to work	16 720	3 706 321	27.7%
Other	3 744	829 932	6.2%
Unspecified	6 227	1 380 339	10.3%
Total	**60 449**	**13 399 724**	**100.0%**

Number of people in Gauteng per CS2016

Table 20 presents a summary of disabilities and physical difficulties disclosed by respondents in Gauteng. A total number of 360 435 persons, representing 2.7% of the population in Gauteng, had to cope with some form of disability or difficulty in accessing public transport modes or facilities. The dominant form of difficulty/disability was the use of crutches or stick at 24%. The reported number of persons with disability increased slightly, from accounting for 1.88% of all difficulties relating to public transport access in 2014 to 2.7% in 2019.

Table 20: Difficulty or disability in accessing public transport

Disability or difficulty	Weighted number of persons	Number of persons	Percentage of persons with difficulty
Climbing stairs	133	29 482	8%
Hearing	219	48 546	13%
Mental handicap	43	9 532	3%
Needs wheelchair	198	43 891	12%
Other	376	83 348	23%
Sight or blind	188	41 674	12%
Speech	39	8 645	2%
Travels with a baby	42	9 310	3%
Uses crutches or stick	388	86 008	24%
Total	**1 626**	**360 436**	**100%**

Table 21 presents a summary of the estimated level of education in Gauteng for 2019, ranging from no formal education to tertiary education. Only 19% of the population indicated that they had post-matric qualifications.

Table 21: Educational level in Gauteng

Educational Level	Number of people (sample)	Weighted number of people	Percentage of educational level
None	3 169	626 928	4.7%
Some primary school	4 532	896 573	6.7%
Completed primary	2 455	485 676	3.6%
Some high school	13 106	2 592 780	19.3%
Completed high school	25 705	5 085 260	38.0%
Diploma with no matric	727	143 824	1.1%
Diploma with matric	3 804	752 551	5.6%
University or college	7 217	1 427 750	10.7%
Unspecified	7 018	1 388 382	10.4%
Total	**67 733**	**13 399 724**	**100.0%**

Number of people in Gauteng per CS2016

At an aggregate level, the people reported to have completed at least a high school education was above 55%. This particular group of people represents a substantial potential market for mobility, i.e. demand for transport services and infrastructure, as they can be expected to fall into the category of either employed or frictionally unemployed (active job seekers); in this way having an effect on the number of work-related trips that are generated.

7 RESULTS: TRIP-MAKING PATTERNS

An important part of the household survey was capturing the number of trips undertaken by households, the purpose of trips, as well as the mode of travel used and the time taken for travel. Of particular interest to this study was the execution of travel during a typical peak period. The trip information recorded in the survey is summarised in this sub-section.

7.1 Intra and Inter municipal travel

Table 22 shows the origin and destination trip distribution matrix in Gauteng province for a typical weekday during 2019 on the basis of weighted survey data. The majority of estimated trips were intra-municipal trips, the highest being in the CoJ with more than three million trips per day. The metro's intra-municipal trips were found to be much higher in the 2014 GHTS at almost four million trips per day.

Table 22: Daily trip distribution[2]

		Trip destination						
		Ekurhuleni	**Johannesburg**	**Sedibeng**	**Tshwane**	**West Rand**	**Outside Gauteng**	**Total**
Trip origin	Ekurhuleni	1 724 992	136 100	1 055	10 550	0	9 495	1 882 193
	Johannesburg	66 456	3 092 909	9 879	37 718	58 374	14 369	3 279 705
	Sedibeng	1 786	23 212	1 346 277	1 786	1 786	10 713	1 385 559
	Tshwane	11 989	5 994	0	2 225 944	0	8 992	2 252 919
	West rand	0	295 037	0	3 598	1 501 571	482 134	2 282 340
	Outside GP	224	224	0	0	0	0	449
	Total	**1 805 447**	**3 553 476**	**1 357 211**	**2 279 596**	**1 561 730**	**525 703**	**11 083 165**

The general number of intra- and inter-regional trips increased by 10% from the reported estimates in 2014 to 11 083 164 in 2019. Intra-municipal trips continue to be significant in Johannesburg, followed by Tshwane and Ekurhuleni, with the West Rand and Sedibeng ranked last. These intra trips represented a significant decline in trips for the CoJ and the CoE of 900 000 and 800 000, respectively; and a corresponding substantial increment in the CoT and the district municipalities from the reported values in GHTS 2019.

Interestingly, inter-municipal trips were highest between the CoJ and West Rand, double the number of trips between the CoJ and the CoE. The latter corridor had reported the most inter-municipal trips in 2014. Trips originating in the West Rand to the CoJ amounted to 295 037 and converse trips originating from

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[2] NB! The disaggregated weighted household survey data into an origin-destination matrix as provided in Table 22 is incredibly sensitive to sampling strategy, a point acknowledged in the GHTS 2014.

the CoJ amounted to 58 374. Trips originating from the CoE destined for the CoJ amounted to 136 100 trips per day, whereas trips to the CoE from the CoJ amounted to 66 456. The CoJ and West Rand had the highest number of trips originating from outside Gauteng.

7.2 Peak travel

The morning peak period is defined as a trip taken between 06:00 and 09:00 regardless of end time. In Table 24, all peak trips were counted and the end times were not considered. Unspecified modes were also excluded.

Table 23: Morning peak-period trips according to purpose

Trip purpose during morning peak	Estimated total number of trips	2019 GHTS % peak trips	2014 GHTS % peak trips	2000 GTS% peak trips
Work at usual work place	1 333 082	39.1%	38.9%	32.2%
Educational	384 300	11.3%	47.7%	47.2%
To go home	307 266	9.0%	2.5%	2.8%
Shopping	294 209	8.6%	2.0%	0.2%
Medical purposes	282 023	8.3%	0.7 %	-
Other	203 683	6.0%	1.2%	6.7%
Looking for work	129 043	3.8%	1.1%	-
Work somewhere else	109 676	3.2%	2.0%	0.7%
Visiting friend or relative	108 588	3.2%	1.7%	-
Unspecified	76 817	2.3%	0.9%	-
Worship	75 293	2.2%	1.3%	-
Drop or pick up someone	49 615	1.5%	1.7%	-
Welfare offices	34 600	1.0%	0.2%	-
Recreational	17 844	0.5%	0.3%	-
Total			**3 817 751**	**4 700 000**
	3 406 039	**100.0%**		

Table 23 shows the morning peak-period trips (from 06:00 to 09:00) according to trip purpose for 2019. A total of 54.2% of the estimated morning peak-period trips were reported for work and education purposes, with a significant decline of more than 30% for educational trips from the GHTS 2014. This could be due to underreporting on educational trips rather its real decline. Further, it is worth noting that the total number of peak-period trips declined slightly by approximately 5% from the GHTS 2014 estimates to 3 406 040 in GHTS 2019.

The number of reported public transport trips between the 2014 and 2019 GHTS is exhibited in Figure 9. Comparatively, the overall estimated number of public transport trips has shown a decline from 2014 GHTS across public transport modes. Train and bus have declined estimated trips compared to minibus taxi.
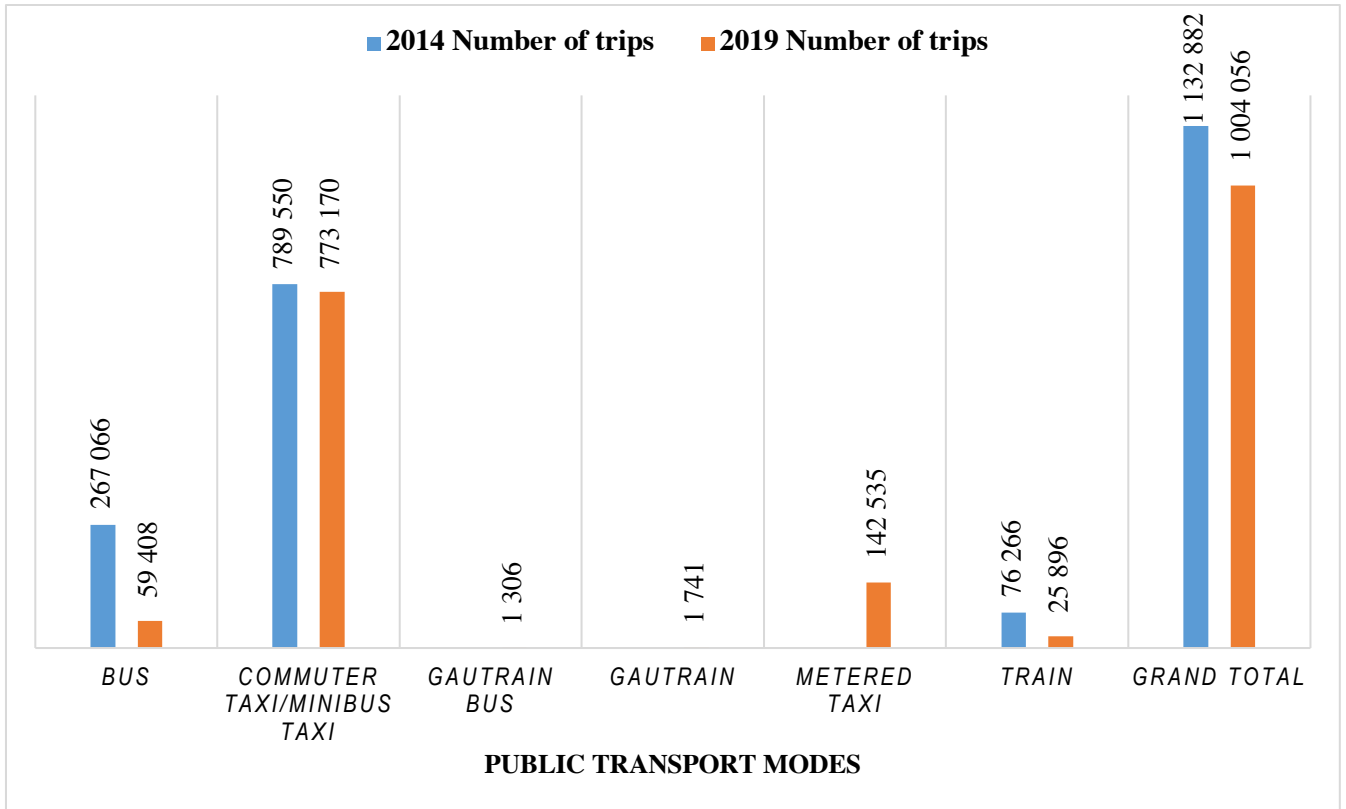
Figure 9: Number of public transport trips

Figure 10 illustrates the comparison of peak morning trips using different studies. Reported peak trips in the past 20 years have generally declined and comparison to past GHTSs have shown a steady but negligible decline in the annual growth rate of about 1%, in the number of reported peak-period trips between surveys.
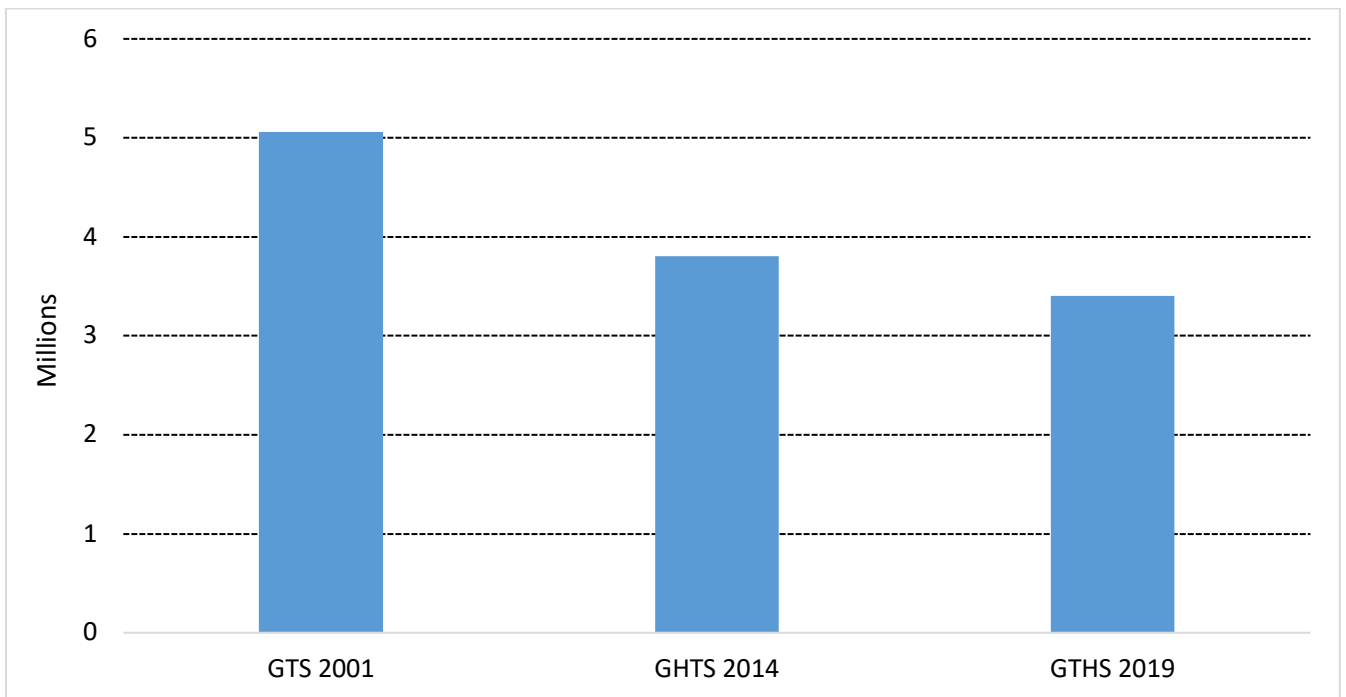
Figure 10: Comparison of number of estimated peak morning trips

Figure 11 presents the cumulative percentage of trips according to different trip departure times between midnight and 11:00 in the morning. Most noticeable, the departure curve did not plateau after 08:00, as was the case in the 2000 survey.

The CoJ is exhibited graphically by a steeper cumulative line curve compared to the rest of the regions and the provincial aggregate. About 60% of departures reported in the CoJ were estimated to have occurred by 07:00 and only 30% of trips by 06:00; entailing that trips in the CoJ at the 50th percentile occurred between 06:01 and 07:00, whereas trips at the 50th percentile at Sedibeng occurred between 07:01 and 08:00.
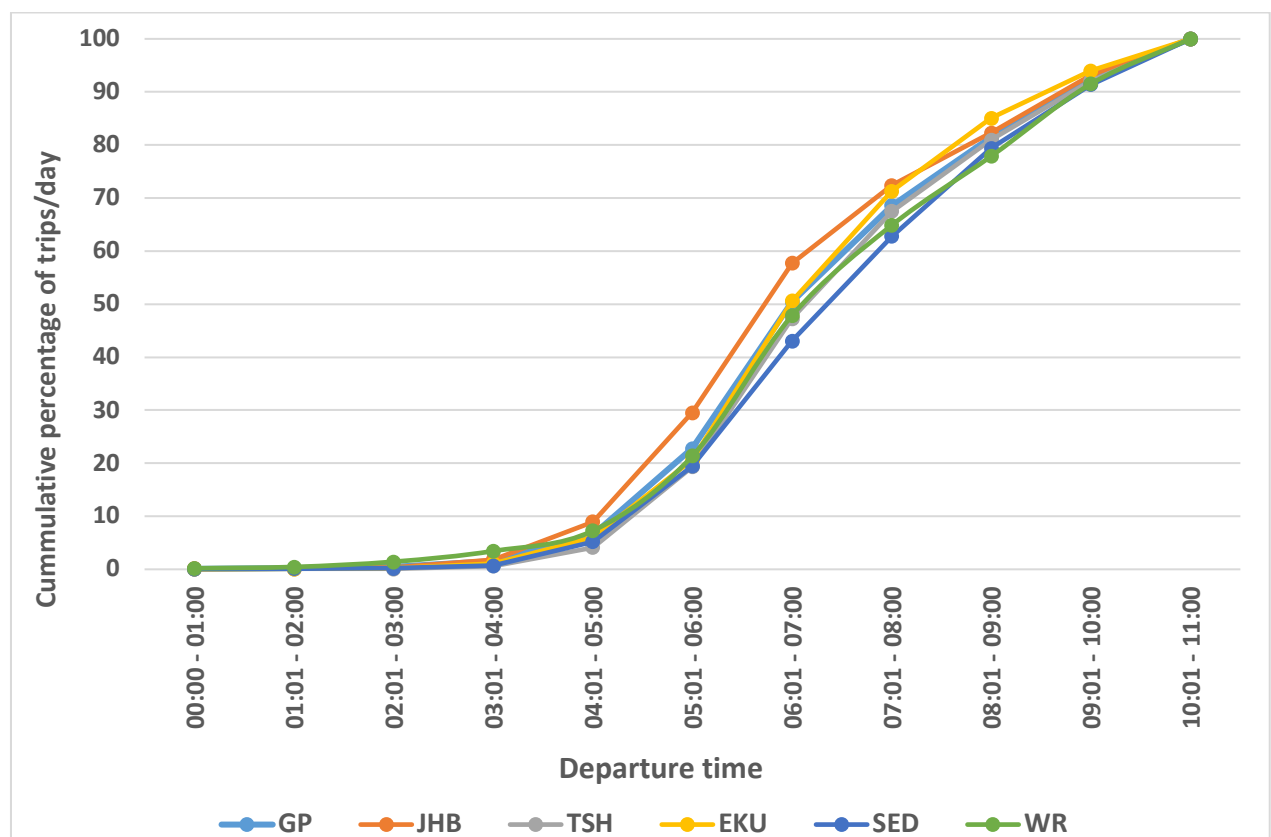
Figure 11: Cumulative percentage of morning peak trips by departure time

Comparatively, the proportion of peak-period trips occurring particularly in the metropolitan areas of the CoE and the CoT by 06:00 was 20% of morning traffic and this grew to 50% of morning peak trips by 07:00. In Sedibeng, 43% of peak trips were estimated to occur by 07:00, whereas 20% of morning peak trips occurred between 00:01 and 08:00.

Commonly across Gauteng, 80% of morning peak trips are estimated to take place between 04:00 and 09:00. Ekurhuleni was higher than the provincial average in the same traffic period and estimated at 85% of morning peak trips. The density of morning departures in Gauteng was concentrated from 05:00 to 07:00 as indicated by a steeper curve in Figure 8 to annotate a strong increase.

Table 24: Morning peak-period trips according to travel mode[3]

Mode of transport	Estimated total number of peak trips	2019 GHTS % peak trips	2014 GHTS % peak trips	2000 GHTS % peak trips
Walk all the way	943 187	27.7%	34.0%	37.7%
Car as a driver	921 437	27.1%	21.9%	19.0%
Commuter or Minibus taxi	724 992	21.3%	21.9%	22.4%
Car as a passenger	175 830	5.2%	8.7%	9.8%
Unspecified	156 289	4.6%	0.0%	-
Metered Taxi	122 133	3.6%	0.4%	-
Other	120 444	3.5%	0.8%	-
Bus	67 117	2.0%	1.8%	4.3%
School Bus	56 586	1.7%	5.0%	-
Company transport	31 413	0.9%	1.0%	0.9%
Lift club passenger	26 896	0.8%	1.6%	1.7%
Train	26 210	0.8%	2.0%	3.5%
Lift club driver	10 894	0.3%	0.1%	-
Bicycle	8 103	0.2%	0.3%	0.6%
Motorcycle	5 777	0.2%	0.2%	0.1%
Gautrain	5 187	0.2%	0.0%	-
Gautrain Bus	1 566	0.0%	0.1%	-
Total	**3 404 058**	**100%**	**100%**	**100%**

Table 24 shows the morning peak period (06:00–09:00) trips by mode of travel in Gauteng. Walk all the way remains a dominant mode of travel and was estimated to generate about 27.7% of peak trips in 2019, a decline of 6.3% from the 2014 GHTS.

Over the past 20 years, changes in walk all the way have been steady as the mode accounted for 34% mode share between the 2000 and 2014 GHTSs. The use of minibus taxi for commuter services has stabilised in the past GHTSs at a mode share of 22%. Similarly, in 2019, minibus taxi use continued to account for 21.3% and is thus being the third most dominant mode of travel following after private car use (car as a driver) at 27.1%.

Table 26 depicts the proportional distribution of mode use according to trip purpose. Generally, commuter trips are dominated by the use of bus, company transport and lift club modes, which recorded a substantial percentage for work purposes of 54%, 71% and 44%, respectively. Private vehicle and minibus taxi trips for the same purpose were recorded at 36% and 30%, correspondingly.

Expectedly, school bus mode is used predominantly for education-related trips as well as for home trips. Of the 2.9% mode share for bus commuters, about 61% of the demand was concentrated in the CoJ. Even though carpooling and lift clubs constitute only a smaller percentage, they are reportedly major means of mobility in the CoT at 42.4% and 54%, respectively.

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[3] NB! Peak trips qualify from start time between 6:00 and 9:00 {(total no. of trips by purpose (sample)/ total no. of households making trips in the sample)* the total number of households in GP}

Table 25: Mode of travel according to trip purpose

Trip purpose	Bicycle	Bus	Car	Commuter or minibus	Company transport	Gautrain	Gautrain bus	Lift club	Metered taxi	Motorcycle	School bus	Train	Unspecified	Walk all the way	Other
Drop or pickup someone	1%	0%	2%	1%	1%	0%	0%	1%	0%	6%	0%	0%	0%	2%	0%
Educational	3%	6%	2%	4%	0%	0%	27%	5%	3%	9%	75%	4%	0%	10%	3%
Looking for work	10%	5%	1%	4%	0%	0%	9%	2%	4%	0%	0%	15%	0%	2%	2%
Medical purposes	9%	4%	4%	5%	1%	25%	9%	5%	7%	9%	0%	2%	0%	8%	4%
Other	6%	1%	4%	4%	0%	0%	0%	1%	5%	9%	0%	3%	0%	7%	51%
Recreational	3%	1%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	1%	1%
Shopping	5%	2%	13%	16%	0%	0%	0%	6%	18%	15%	0%	11%	0%	14%	7%
To go home	20%	20%	24%	24%	25%	8%	36%	30%	25%	15%	19%	21%	1%	24%	9%
Unspecified	0%	1%	1%	0%	0%	17%	0%	0%	1%	0%	1%	0%	96%	1%	1%
Visiting friend or relative	13%	3%	3%	4%	1%	0%	9%	1%	8%	6%	1%	5%	0%	11%	2%
Welfare offices	4%	1%	1%	1%	0%	0%	0%	2%	1%	0%	1%	1%	0%	0%	0%
Work at usual work place	19%	52%	40%	30%	65%	8%	0%	43%	19%	18%	2%	33%	1%	13%	16%
Work somewhere else	2%	2%	3%	3%	6%	42%	9%	3%	4%	9%	1%	3%	0%	2%	2%
Worship	6%	2%	3%	2%	0%	0%	0%	1%	4%	0%	0%	2%	0%	4%	2%
% Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 26: Aggregate regional percentage distribution of mode share for work-related trips

Mode of transport for work	Bicycle	Bus	Car as a driver	Car as a passenger	Commuter or minibus taxi	Company transport	Gautrain	Gautrain bus	Lift club driver	Lift club passenger	Metered taxi	Motorcycle	Other	School bus	Taxi	Train	Walk all the way	% Total
City of Johannesburg	19.0	61.1	32.3	16.3	47.1	34.7	66.7*	0.0	27.6	40.0	8.1	0.0	27.1	42.9	25.0	51.1	22.6	34.1
City of Tshwane	4.8	19.0	20.8	42.4	13.8	5.7	0.0	100.0*	34.5	12.2	12.1	44.4*	18.2	0.0	0.0	23.9	25.8	20.1
City of Ekurhuleni	33.3	4.4	19.9	19.2	13.9	14.2	33.3*	0.0	13.8	18.3	63.5	33.3*	16.7	28.6	25.0	20.7	24.0	19.8
Sedibeng	9.5	3.6	7.7	7.6	10.9	7.4	0.0	0.0	3.4	1.7	1.6	11.1	2.6	14.3	0.0	1.1	8.3	8.1
West Rand	33.3	11.9	19.2	14.5	14.3	38.1	0.0	0.0	20.7	27.8	14.7	11.1	35.4	14.3	50.0	3.3	19.3	17.9
% Total	0.2	2.9	34.9	5.5	28.3	2.0	0.1	0.0	0.3	1.3	3.5	0.1	2.2	0.1	0.0	1.1	17.4	100.0

*Very few respondents

Table 26 gives the percentage of trips made by mode of transport for work in Gauteng province. Most of the trips were taken using 'car as a driver' amounting to 35% followed by 'Minibus taxi' at 28% mode share. A sizable percentage of workers, just above 17%, walk all the way and these incidences are estimated to be significantly concentrated in the metropolitan regions and are above the provincial average.

Table 27: Mode of transport for work by sub-region

Municipality	Sub region	Bicycle	Bus	Car	Commuter or minibus taxi	Company transport	Gautrain	Gautrain bus	Lift club	Metered taxi	Motorcycle	School bus	Train	Walk all the way	Other	Unspecified	% Total
City of Johannesburg	Alexandra / Modderfontein	0%	1%	27%	49%	0%	0%	0%	0%	0%	0%	0%	0%	23%	0%	0%	100%
	Diepmeadow	0%	11%	31%	32%	1%	0%	0%	1%	0%	0%	0%	2%	17%	5%	0%	100%
	Diepsloot	1%	0%	9%	70%	5%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	100%
	Joburg Central	0%	0%	18%	36%	9%	0%	0%	0%	0%	0%	0%	0%	36%	0%	0%	100%
	Joburg South	0%	0%	83%	11%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%	2%	100%
	Midrand	0%	3%	16%	40%	2%	1%	0%	0%	2%	0%	0%	1%	29%	2%	6%	100%
	Northcliff / Rosebank	0%	3%	70%	15%	0%	0%	0%	0%	0%	0%	0%	0%	9%	3%	0%	100%
	Orange Farm / Ennerdale	0%	3%	33%	43%	2%	0%	0%	3%	5%	0%	0%	3%	8%	1%	0%	100%
	Roodepoort	1%	0%	34%	42%	3%	0%	0%	0%	0%	0%	0%	2%	15%	2%	1%	100%
	Sandton / Randburg	0%	2%	42%	27%	6%	0%	0%	0%	4%	0%	0%	0%	17%	0%	2%	100%
	Soweto / Doornkop	0%	5%	44%	38%	2%	0%	0%	3%	0%	0%	0%	2%	5%	1%	1%	100%
City of Tshwane	Akasia / Rosslyn	0%	4%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	42%	100%
	Centurion	0%	2%	51%	9%	0%	0%	0%	0%	0%	0%	0%	0%	36%	0%	0%	100%
	Bronkhorstspruit Rural East	0%	5%	47%	23%	0%	0%	0%	0%	0%	0%	0%	0%	23%	0%	2%	100%
	Bronkhorstspruit Rural West	0%	0%	95%	3%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	100%
	Bronkhorstspruit Urban (Bronkhorstspruit core, Zithobeni)	3%	5%	60%	3%	0%	0%	0%	3%	0%	0%	0%	0%	28%	0%	0%	100%
	Mamelodi / Nellmapius	0%	3%	37%	27%	1%	0%	0%	2%	3%	0%	0%	4%	18%	4%	1%	100%
	Moot	0%	1%	68%	4%	1%	0%	0%	3%	1%	1%	0%	0%	14%	5%	0%	100%
	Cullinan Rural	0%	2%	41%	39%	0%	0%	0%	0%	2%	2%	0%	0%	13%	2%	0%	100%

Municipality	Sub region	Bicycle	Bus	Car	Commuter or minibus taxi	Company transport	Gautrain	Gautrain bus	Lift club	Metered taxi	Motorcycle	School bus	Train	Walk all the way	Other	Unspecified	% Total
	Cullinan Urban (Cullinan / Rayton)	0%	0%	50%	30%	0%	0%	0%	0%	5%	0%	0%	0%	8%	8%	0%	100%
	Pretoria CBD	0%	0%	33%	33%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	100%
	Pretoria East	0%	1%	78%	7%	0%	0%	0%	0%	0%	0%	0%	0%	13%	1%	0%	100%
	Pretoria North	0%	0%	71%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	25%	100%
	Pretoria West / Atteridgeville	0%	1%	36%	14%	0%	0%	0%	2%	3%	0%	0%	0%	42%	1%	0%	100%
	Rooiwal	0%	5%	26%	13%	0%	0%	0%	3%	13%	0%	0%	0%	39%	0%	0%	100%
	Soshanguve	0%	4%	43%	26%	1%	0%	0%	1%	1%	0%	0%	2%	14%	1%	6%	100%
	Temba, Winterveld, Mabopane, Ga-rankuwa	0%	3%	34%	27%	1%	0%	0%	3%	3%	0%	0%	0%	25%	2%	3%	100%
	Tshwane West Rural	0%	0%	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	17%	17%	100%
	Alberton	0%	0%	78%	0%	0%	0%	0%	2%	0%	2%	0%	0%	18%	0%	0%	100%
	Brakpan / Benoni / Springs	0%	2%	53%	16%	2%	0%	0%	2%	3%	0%	0%	2%	17%	2%	3%	100%
	Daveyton	1%	0%	42%	8%	5%	0%	0%	1%	21%	0%	0%	4%	16%	0%	1%	100%
	Ekurhuleni Rural	0%	0%	40%	2%	1%	0%	0%	0%	43%	0%	0%	0%	11%	0%	2%	100%
	Germiston / Boksburg	1%	0%	45%	22%	4%	0%	0%	4%	3%	0%	0%	0%	21%	0%	0%	100%
	Katorus	0%	0%	30%	26%	1%	0%	0%	0%	8%	0%	0%	1%	27%	5%	2%	100%
	Kempton Park / JIA / Boksburg North	0%	1%	54%	8%	0%	0%	0%	2%	16%	0%	0%	0%	14%	0%	3%	100%
	Kwatsaduza	1%	1%	35%	32%	2%	0%	0%	1%	7%	1%	0%	0%	20%	1%	1%	100%
Ekurhuleni	Tembisa / Clayville	0%	2%	30%	17%	0%	0%	0%	2%	14%	0%	1%	4%	26%	1%	3%	100%

Municipality	Sub region	Bicycle	Bus	Car	Commuter or minibus taxi	Company transport	Gautrain	Gautrain bus	Lift club	Metered taxi	Motorcycle	School bus	Train	Walk all the way	Other	Unspecified	% Total
Sedibeng	Emfuleni LM Urban (Evaton, VdBP, Vereeniging)	0%	2%	29%	31%	2%	0%	0%	0%	0%	0%	0%	0%	17%	1%	17%	100%
	Lesedi LM Rural	0%	0%	37%	48%	1%	0%	0%	0%	1%	0%	0%	0%	11%	1%	0%	100%
	Lesedi LM Urban (Heidelberg / Ratanda)	0%	2%	31%	60%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	100%
	Midvaal LM Rural East	0%	0%	54%	18%	2%	0%	0%	0%	2%	0%	0%	0%	18%	0%	7%	100%
	Midvaal LM Rural West	2%	2%	38%	28%	0%	0%	0%	2%	0%	0%	2%	0%	17%	0%	9%	100%
West Rand	Merafong LM	0%	5%	41%	15%	6%	0%	0%	1%	3%	0%	0%	0%	11%	12%	5%	100%
	Mogale City LM Rural	1%	0%	32%	25%	7%	0%	0%	1%	1%	1%	0%	0%	32%	0%	0%	100%
	Mogale City LM Urban (Krugersdorp / Kagiso)	0%	0%	42%	27%	1%	0%	0%	4%	1%	0%	0%	0%	22%	2%	1%	100%
	Randfontein LM Rural	15%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	0%	0%	100%
	Randfontein LM Urban	0%	0%	37%	23%	3%	0%	0%	4%	4%	0%	0%	0%	17%	2%	10%	100%
	Westonaria LM	0%	5%	35%	21%	7%	0%	0%	0%	3%	0%	0%	0%	10%	1%	16%	100%
	% Average Total	**0%**	**3%**	**38%**	**28%**	**2%**	**0%**	**0%**	**2%**	**3%**	**0%**	**0%**	**1%**	**17%**	**2%**	**4%**	**100%**

Table 27 shows the main mode of travel for work in each sub-region for a typical weekday. The most dominating modes of travel for work were car, minibus taxi and walk all the way. Minibus taxis accounted for 28% of trips on average. Generally, private cars were the most popular mode of travel in 2019 and accounted for 38% of all the trips on average. A significant number of trips in Johannesburg South, Northcliff/Rosebank, Bronkhorstspruit Rural West, Pretoria East, Pretoria North and Alberton were undertaken by car.

The use of minibus taxi was more popular in Lesedi LM Urban (Heidelberg/Ratanda); Lesedi LM Rural; Emfuleni LM Urban (Evaton, VdBP, Vereeniging); Roodepoort; Orange Farm/Ennerdale; Midrand; Diepsloot and Alexandra/Modderfontein. A significant population within Johannesburg Central; Midrand and Alexandra in the CoJ; Pretoria West/Atteridgeville and Rooiwal in Tshwane as well as Mogale City and Randfontein in the West Rand was estimated to have walk all the way as a mode use.

7.3 Travel time

This section measures commuters' perception of the time it takes commuting members of households to access a first mode of transport and to reach final destination.
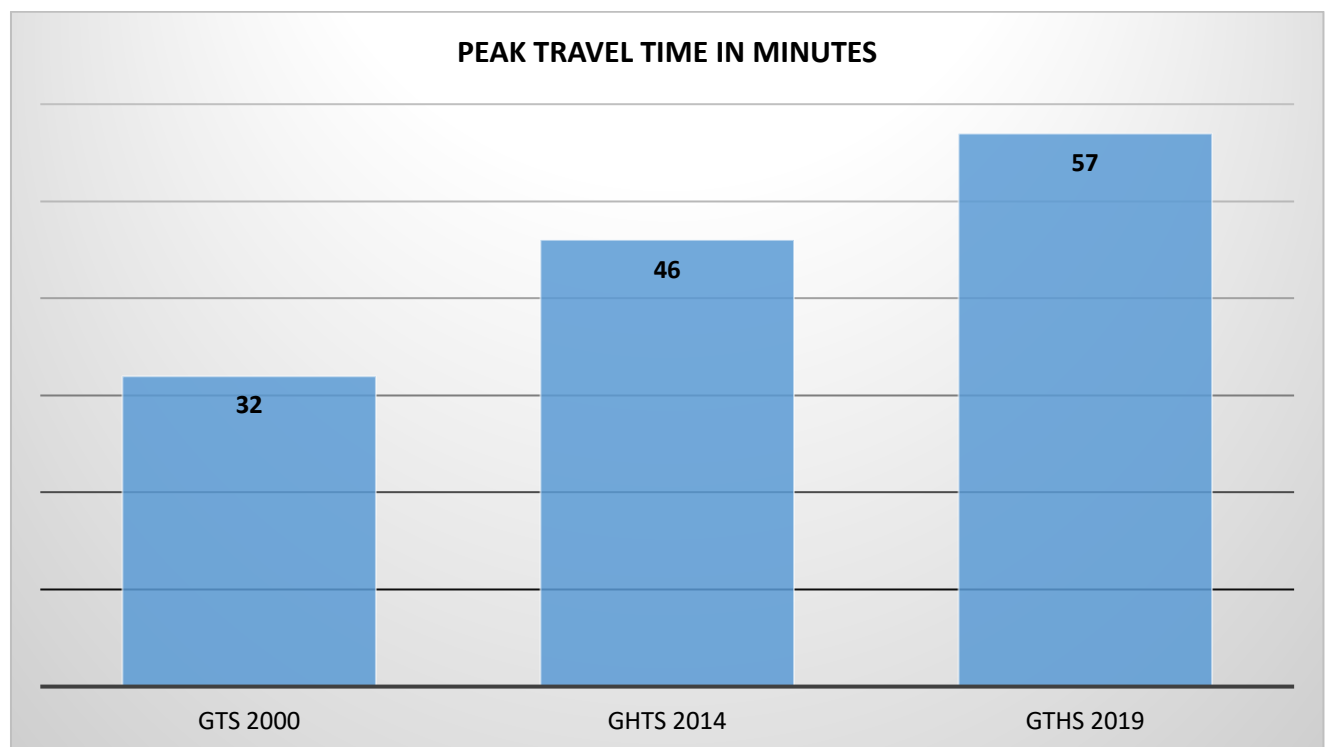
Figure 12: Comparison of peak travel time in minutes over time

The 2019 results revealed that comparatively, average travel times on what is considered a typical travel period, i.e. Tuesday to Thursday, in Gauteng has increased significantly by 17% from 46 minutes in 2014. (GHTS 2014). The overall observed changes in average travel time over the past 20 years as inferred from the GTS 2000 revealed that average travel time has almost doubled in Gauteng as exhibited in Figure 12.

Table 28 depicts the distribution of average total travel times of households for peak period (one way) using modes of transport. The analysis showed that on average, it took longer (01:25:16) to travel by metro rail during peak period.

Table 28: Average travel time for peak-period trips (one way) according to mode of travel

Mode	Weighted number of peak trips	% peak trips	Average travel time
Walk all the way	701 576	30.7%	00:46:53
Car as a driver	598 429	26.2%	00:59:55
Commuter or minibus taxi	567 528	24.8%	00:56:56
Car as a passenger	129 478	5.7%	00:46:59
Other	86 827	3.8%	00:44:49
Metered taxi	80 298	3.5%	00:58:57
Bus	37 211	1.6%	01:19:39
School bus	24 590	1.1%	00:45:24
Lift club passenger	18 497	0.8%	01:02:49
Train	12 404	0.5%	01:25:16
Company transport	11 969	0.5%	01:04:22
Bicycle	8 487	0.4%	00:54:37
Lift club driver	5 875	0.3%	00:55:33
Motorcycle	2 394	0.1%	00:30:00
Gautrain	1 088	0.0%	01:36:00
Gautrain bus	218	0.0%	00:30:00
Total	**2 286 869**	**100.0%**	**00:57:23**

The use of Gautrain ranked second although only few trips were recorded from the sample for this particular mode. Nonetheless, travel time by bus was estimated to take about five minutes less during peak periods compared to train. The 2019 aggregated average travel time for peak periods in Gauteng is estimated at 57 minutes.

Graphically, the detailed comparison of average travel time for modes during morning peak is provided in Figure 13. Notably, minibus taxi and lift clubs' estimated travel times have reportedly stabilised at around 55 minutes and 40 minutes (one-way travel), whereas all other modes exhibited increasing values over time.
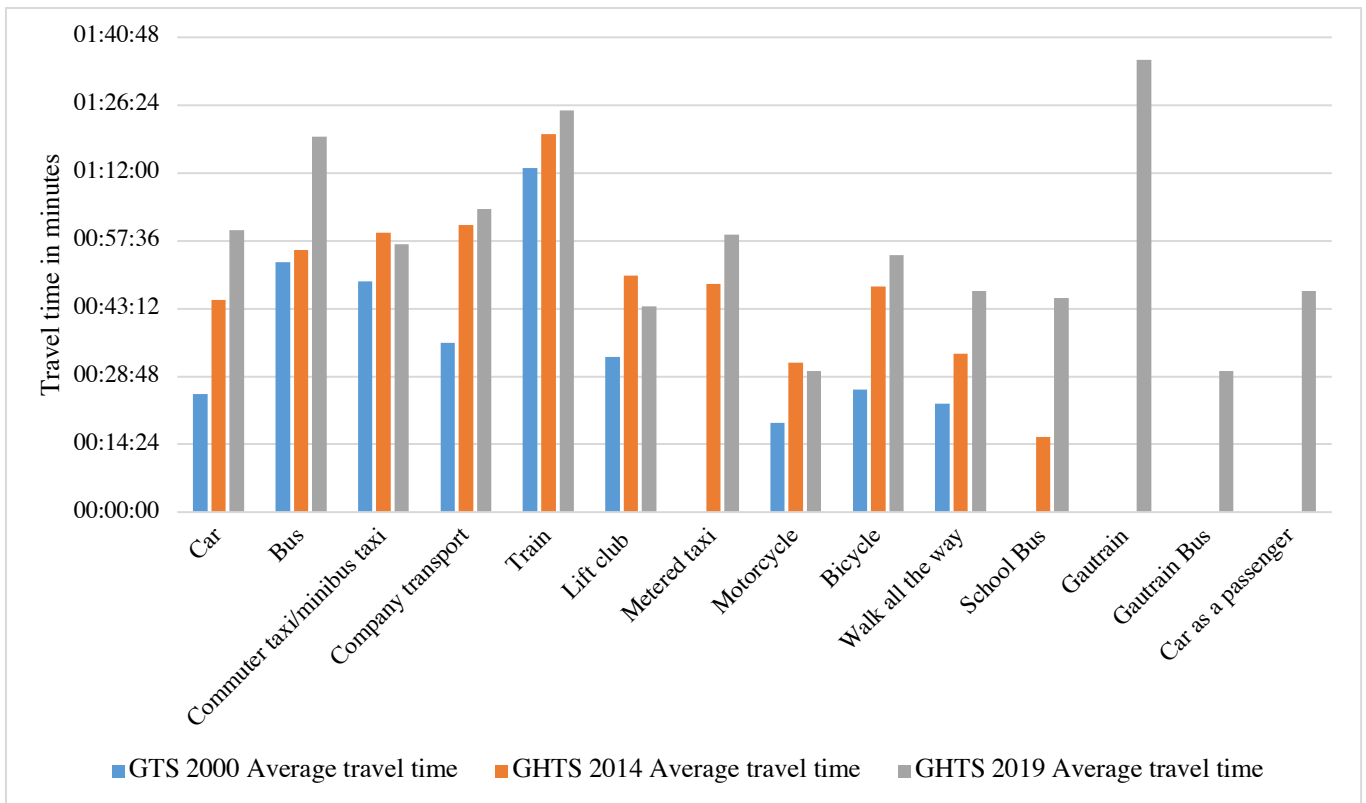
Figure 13: Travel time comparison by mode from GTS 2000, GHTS 2014 and GHTS 2019

The comparison of mode shares as documented in past HTS studies in Gauteng is illustrated in Figure 14 using individual travel time distribution. The road-based motorised travel time exhibited relatively lower mean values than trains.
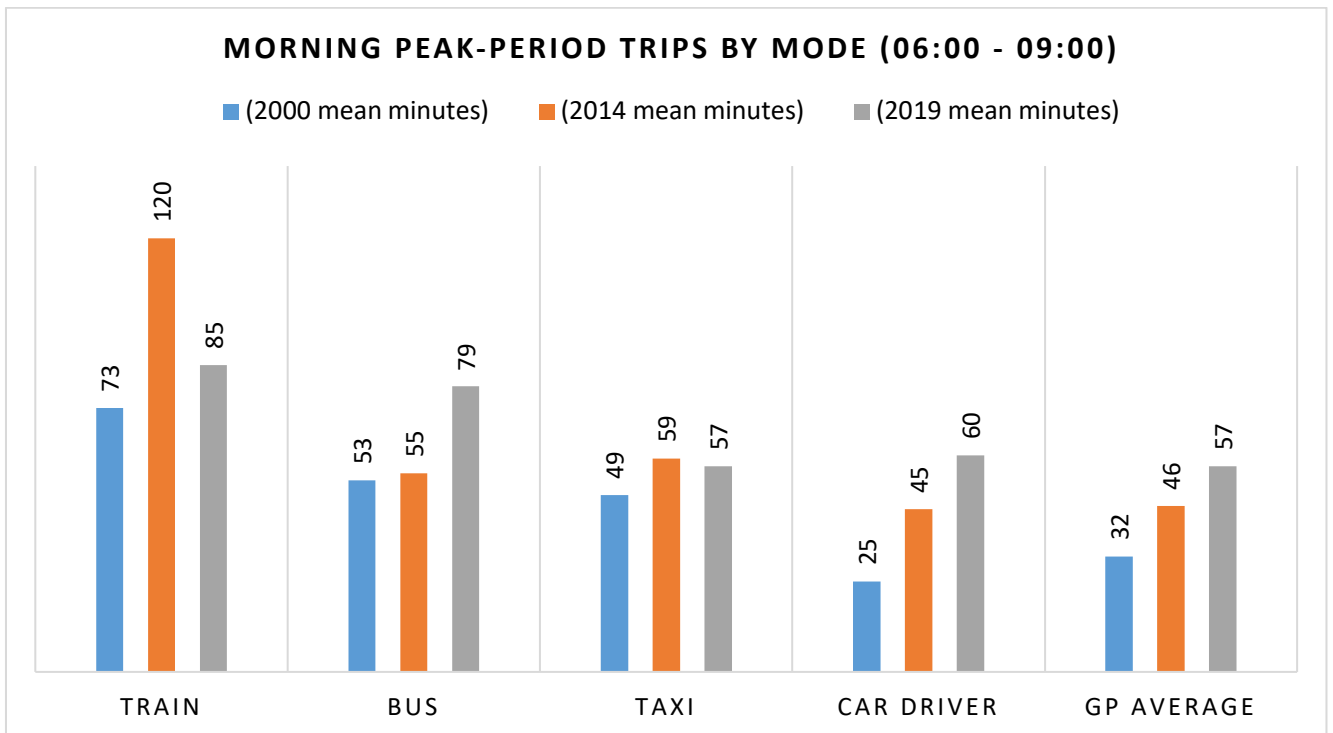
Figure 14: Comparison of morning peak travel time in minutes by mode (06:00–09:00) since 2000

Table 29 displays general commuter average walk times to a) access the first mode of public transport and b) to reach their final destination during the morning peak period. Accessibility to road-based transport services as perceived by households revealed increased walking times for both forward and return leg trips compared to the 2014 GHTS.

Gautrain buses produced the least access times both at the start of the trip and at the end of the trip, and minibus taxi was ranked second. Rail[4] modes in the past series of the GHTS were typically associated with significant walk times at the beginning of the trip. This has stabilised at approximately 20 minutes for Metrorail; with the exception of the Gautrain, which was estimated to take 16 minutes. Conversely, Gautrain has the highest return average walking trip of 20 minutes, two minutes above walk times to Metrorail services.

Table 29: Mean walking time to access first public transport mode of travel and final destination

Mode of transport	Number of trips (survey)	Estimated total number of trips	% trips	Average walking time at start (minutes)	Average walking time at the end of trip (minutes)
Bus	273	59 408	5.9%	14.2	13.1
Commuter or minibus taxi	3553	773 170	77.0%	11.8	11.2
Gautrain	8	1 741	0.2%	16.4	19.5
Gautrain bus	6	1 306	0.1%	5.5	6.5
Metered taxi	655	142 535	14.2%	16.1	16.1
Train	119	25 896	2.6%	19.6	17.7
Total	**4 614**	**1 004 055**	**100.0%**	**13.9**	**14.0**
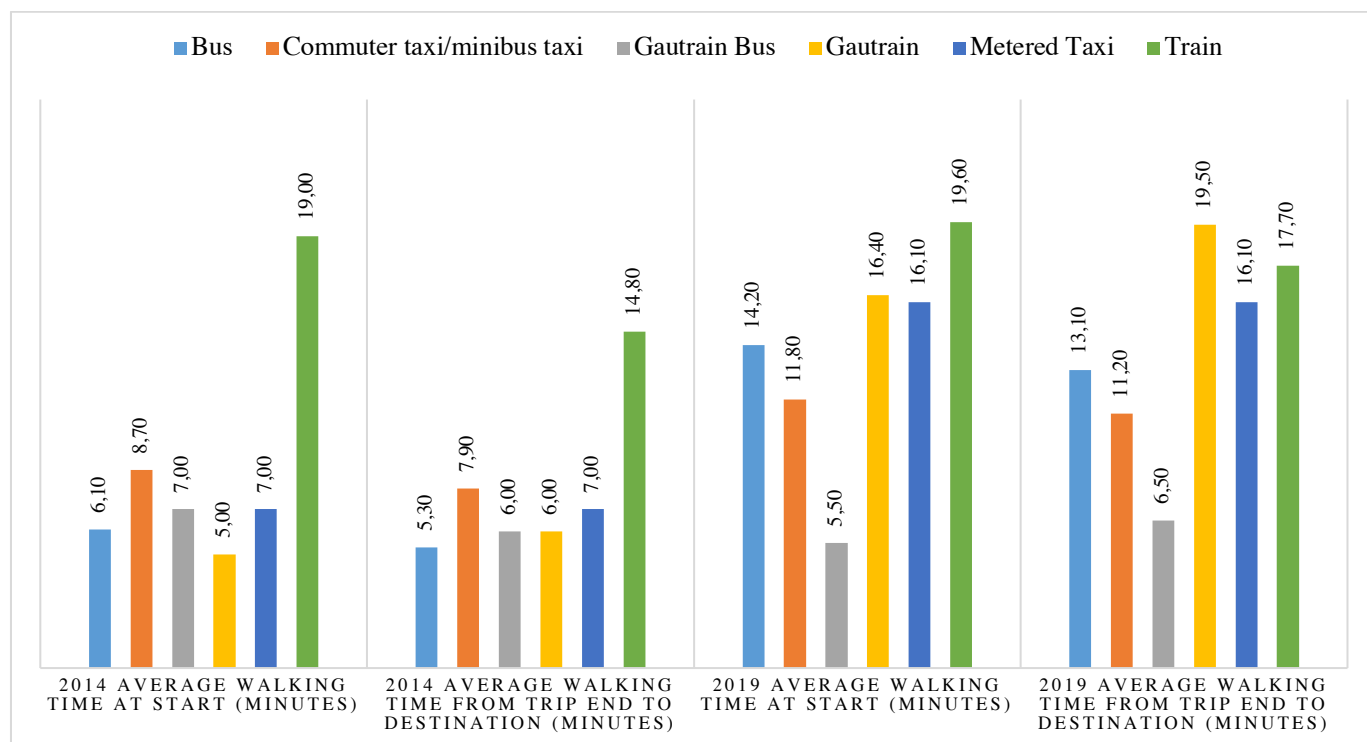
Figure 15: Walking times to and from nearest public transport comparison

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[4] It should be noted that the Gautrain bus numbers must be interpreted with some level of caution because there were few Gautrain bus users in the sample.

Commuters' perception of walking times in 2019 did not correlate with people's income. Generally, access times appear to have doubled between the two GHTSs as exhibited by high values particularly for bus, Gautrain and metered taxi.

Table 30: Walking time before and after public transport trip by income group for peak period work travel

Household monthly income	Estimated total number of trips	% trips	Average walking time at trip start (minutes)	Average walking time from trip end (minutes)
Nothing	6 528	1.4%	8.3	8.3
R1 - R200	218	0.0%	30.0	30.0
R201 - R500	1 958	0.4%	16.7	17.2
R501 - R1000	6 964	1.5%	12.2	16.5
R1001 - R1500	20 891	4.4%	12.4	19.4
R1501 - R2500	29 813	6.3%	14.5	18.0
R2501 - R3500	38 517	8.2%	13.5	13.4
R3501 - R4500	53 532	11.4%	13.3	11.7
R4501 - R6000	60 931	13.0%	12.8	10.6
R6001 - R8000	45 481	9.7%	13.2	11.2
R8001 - R11 000	24 808	5.3%	12.1	9.5
R11 001 - R16 000	15 886	3.4%	11.0	10.8
R16 001 - R30 000	4 787	1.0%	13.2	12.7
R30 001 or More	653	0.1%	5.3	4.0
Don't know	42 652	9.1%	9.4	8.0
Refuse to answer	116 422	24.8%	10.1	9.3
Total	**470 041**	**100.0%**	**13.0**	**13.2**

Typically, low income groups, i.e. R0–R500, exhibited high levels of walk time for both forward and return trip legs, exceeding the mean walk time of 13 minutes and 13.2 minutes, respectively. In 2014, persons from relatively higher income households (i.e. above R30 000) recorded their estimated walking time to access the first mode of transport as much shorter than was the actual case. This pattern was not seen in the 2019 survey. See Figure 16 below.

The comparison of walking times of households using public transport between 2014 and 2019 shows the general spread of income groups and their respective perception of the time it takes to walk to a public transport service. Low income groups of R1–R200 have revealed a substantial increment in commuting walks whereas high income groups of more than R30 000 have perceived relatively lower walk times to access public transport services. A similar trend was observed from participants who refused to disclose income.
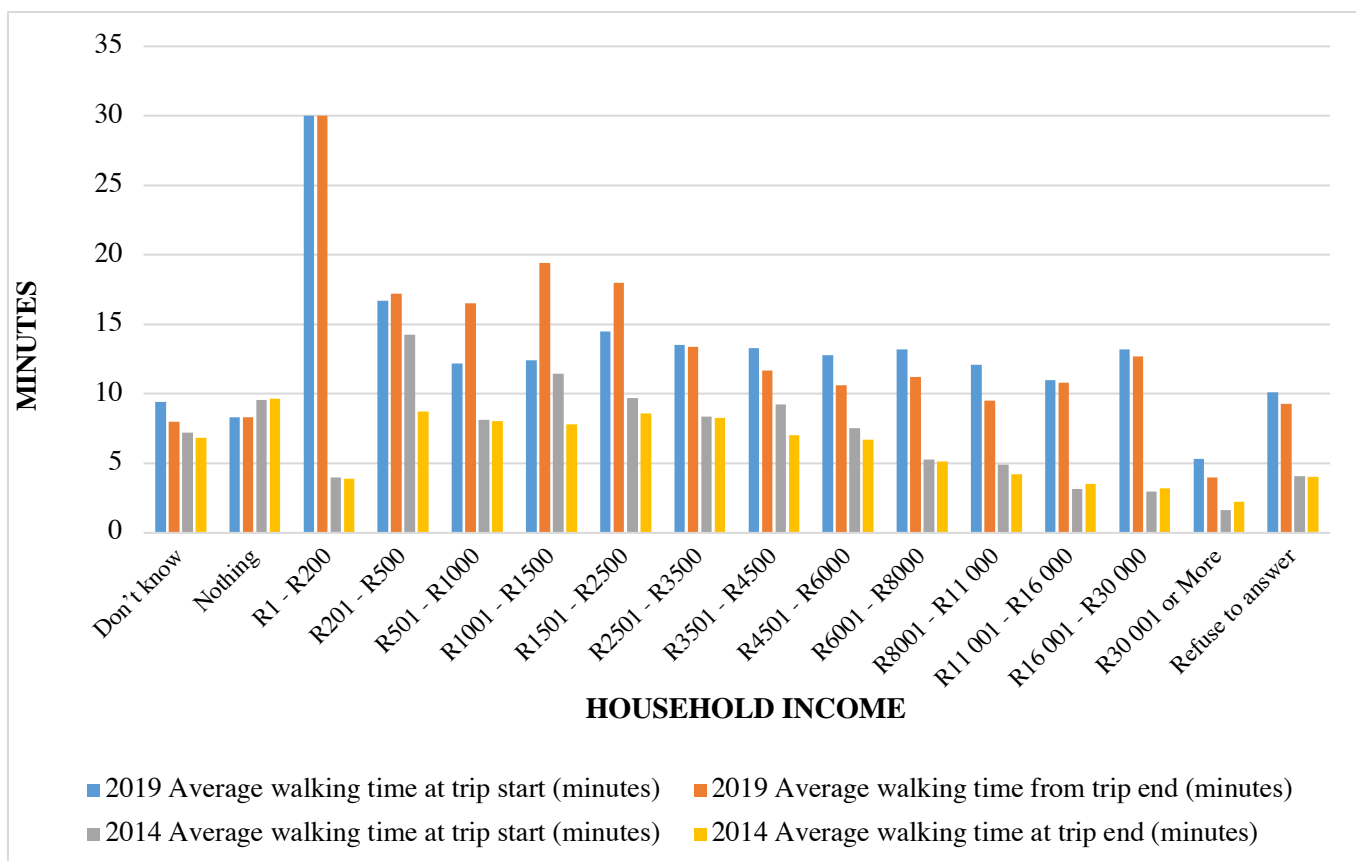
Figure 16: Comparison walking time before and after public transport trip by income group for peak period work travel

Table 31 presents the education-related trips during the morning peak period based on the average time it took learners and students to access public transport modes at trip start and to reach their destination at trip end. Generally, learners perceived accessibility of road-based transport services such as metered taxi and conventional bus to have lengthier walking times when benchmarked against the provincial average of 13 minutes for forward trips and 13.3 minutes for return legs; whereas walk times to access school bus were typically associated with lower durations for both legs of the trips.

Table 31: Walking time for peak-period trips for education-related purposes according to mode of travel

Transport mode	Estimated total number of trips	% Trips	Average walking time to trip start	Average walking time from trip end to destination
Bus	5 440	4.1%	14.8	14.2
Commuter or minibus taxi	60 931	45.5%	12.0	11.9
Gautrain bus	435	0.3%	7.5	10.0
Metered taxi	8 704	6.5%	16.5	18.0
Other	5 658	4.2%	16.6	16.8
School bus	51 138	38.1%	9.4	8.9
Train	1 741	1.3%	14.4	13.3
Total	**134 047**	**100.0%**	**13.0**	**13.3**

The 2019 provincial mean value is almost twice the reported walk times for both trips in 2014, which estimated that it took a person seven minutes on average to access the first public transport mode and seven minutes' walk time from trip end to reach destination. Walk times for both trip legs for Metrorail are lower than other road-based modes at 14.4 minutes at trip start and matching the provincial average at 13.3 minutes at trip end.

Table 32: Access times for education-related trips during peak period by household income

Household monthly income	Number of trips (survey)	Estimated total number of trips	% Trips	Average walking time at trip start (minutes)	Average walking time from trip end to destination (minutes)
Nothing	6	1 306	0.3%	10.8	10.0
R1 - R200	1	218	0.1%	30.0	30.0
R201 - R500	100	21 761	5.7%	14.9	16.2
R501 - R1000	135	29 377	7.6%	16.2	14.0
R1001 - R1500	165	35 906	9.3%	15.3	15.8
R1501 - R2500	227	49 398	12.9%	14.8	15.0
R2501 - R3500	149	32 424	8.4%	14.4	13.6
R3501 - R4500	125	27 201	7.1%	13.9	12.4
R4501 - R6000	97	21 108	5.5%	12.3	10.3
R6001 - R8000	92	20 020	5.2%	15.7	13.8
R8001 - R11 000	80	17 409	4.5%	12.0	10.7
R11 001 - R16 000	52	11 316	2.9%	12.0	11.6
R16 001 - R30 000	32	6 964	1.8%	11.7	11.3
R30 001 or More	17	3 699	1.0%	11.5	10.3
Don't know	209	45 481	11.8%	13.1	11.7
Refuse to answer	279	60 713	15.8%	12.1	10.8
Total	**1766**	**384 301**	**100.0%**	**14.4**	**13.6**

The distribution of peak-period walk times for education-related trip purpose, using a public transport mode is exhibited in Table 32. These results are predominantly based on the general population's perception of how long it took to walk to and from a public transport mode use as opposed to an actual measure of walking time. Perceptively, average walking travel times generally decreased with increasing income ranges. For those in the higher income range (R30 000), however, the end trip walking distances to a destination from a public transport mode use were relatively higher (18.4 minutes) compared to accessing a mode of public transport (11.5 minutes).

Past HTSs have shown that students from low income groups, i.e. R501–R1000, recorded walk times for forward trip legs which were 2% higher than the aggregate average walk time of 13 minutes. Conversely, lower level income groups, i.e. R201–R500, exhibited walking times of almost 3% higher than the provincial average of 13 minutes for return education trips.

Interestingly, higher income groups appear to have more accessible mobility compared to lower income groups, indicating a positive relationship between income and accessibility. This relationship was also exhibited in past publications of the GHTS, albeit at much lower provincial average walking times for both trip start and trip end of 5.37 minutes and 5.06 minutes in 2014, respectively; and 7.5 minutes average walking times for trip start in the 2000 GTS.

Table 33: Morning peak trip departure time according to trip purpose

Purpose of trip	Estimated total number of trips	Before 06:00	06:00 - 06:59	07:00 - 07:59	08:00 - 09:00
Work at usual work place	1 741 392	39.5%	29.8%	11.1%	19.7%
To go home	567 306	28.6%	29.1%	28.3%	14.0%
Shopping	399 368	7.3%	19.7%	68.7%	4.2%
Educational	385 107	28.8%	61.2%	8.1%	1.8%
Other	265 424	23.0%	24.8%	40.0%	12.1%
Medical purposes	247 128	28.7%	32.3%	32.6%	6.4%
Unspecified	195 218	9.2%	17.0%	16.4%	57.3%
Visiting friend or relative	147 961	7.3%	21.3%	63.3%	8.0%
Work somewhere else	140 784	28.8%	25.6%	25.0%	20.6%
Looking for work	126 365	27.5%	28.0%	30.1%	14.4%
Worship	110 112	6.9%	20.9%	69.2%	3.0%
Drop or Pickup someone	55 244	26.8%	39.9%	21.3%	12.0%
Welfare offices	36 825	18.0%	35.8%	39.3%	6.9%
Recreational	27 098	17.9%	21.3%	52.7%	8.0%
Traditional healer	10 070	11.2%	33.7%	49.3%	5.7%
Grand Total	**4 455 403**	**28.3%**	**30.2%**	**26.2%**	**15.3%**

* Respective category trip percentage of the number total trips for the purposes indicated

Table 33 illustrates the estimated departure time distribution as measured according to trip purpose. From the 2019 analysis, a significant 43% of typical morning peak trips were estimated to occur between 7:00 and 09:00. Two-thirds of educational trips were typically executed between 07:00 and 07:59, whereas the distribution of trips for work at usual place peaks between 06:00 and 06:59, accounting for almost 40% of peak trips in the category. A substantial amount of recreational, welfare offices and shopping trips were executed in the last hour of the morning peak, accounting for 30% or more for each of the weighted trips for the respective categories. Distinct from the 2019 GHTS is an evident increase in the overall number of shopping trips undertaken during the last morning peak hour.

Error! Not a valid bookmark self-reference. *displays morning peak-period departure times according to household income. For the 2019 GHTS, 56.4% of the peak-period trips were made between 07:00 and 09:00 and these are similar to the 58% recorded in GHTS 2014. A substantial number of trips for low income groups, i.e. R1−R1500, is estimated to occur during the last hour of the morning peak. Similarly, middle/lower-income groups, i.e. R2 500−R4 500 and R11 001−R16 000, tended to start travelling between 07:00 and 09:00 as the predominant percentage of trips fall in this time interval. The patterns of the middle-income group (R3 501−R 8 000) suggest that for this particular group, traveling earlier than 07:00 is desired while no-income and higher-income groups of R11 001−R16 000 had more trips that occurred later than 07:00.*

Table 34: Peak-trip departure time by income groups

	Weighted number of trips	Before 06:00	06:00 - 06:59	07:00 - 07:59	08:00 - 09:00
Nothing	64 837	15.1%	18.8%	28.2%	37.9%
R1 - R200	10 281	34.1%	29.4%	13.7%	22.9%
R201 - R500	84 716	18.8%	15.5%	30.8%	34.9%
R501 - R1000	152 238	13.4%	18.0%	30.9%	37.7%
R1001 - R1500	294 657	10.8%	25.5%	27.8%	35.9%
R1501 - R2500	403 030	13.4%	22.2%	29.8%	34.6%
R2501 - R3500	322 555	14.4%	21.8%	31.7%	32.2%
R3501 - R4500	311 466	15.8%	26.2%	31.5%	26.5%
R4501 - R6000	302 963	19.6%	26.6%	31.5%	22.3%
R6001 - R8000	266 233	18.4%	29.2%	31.4%	21.0%
R8001 - R11 000	224 887	16.2%	32.8%	31.0%	20.1%
R11 001 - R16 000	203 702	17.2%	29.5%	33.5%	19.7%
R16 001 - R30 000	198 055	11.2%	32.4%	36.4%	20.1%
R30 001 or More	158 313	8.5%	33.0%	35.1%	23.5%
Don't know	347 436	20.7%	33.0%	25.7%	20.6%
Refuse to answer	1 110 035	14.7%	32.9%	28.7%	23.7%
Total	**4 455 403**	**15.3%***	**28.3%***	**30.2%***	**26.2%***

Percentage of trips accounted for in the time category over the total trips

The analysis of travel time reveals a pattern of increased travel times commonly associated with a phenomenon of 'active' peak spreading. This phenomenon is frequently related to transport network and systems delays resulting from increasing traffic demand, consequently producing longer travel times.

Evidently in the present GHTS 2019, there was an emerging trend of households adjusting peak trips to start later, seemingly responding to network delays, i.e. longer travel durations as exhibited in Table 33: Morning peak trip departure time according to trip purpose and Table 34: Peak-trip departure time by income groups.

***Error! Not a valid bookmark self-reference.** highlights the levels of estimated productivity and interaction of travel demand with the transport system according to household income. From the results, it can be deduced that of all work-related trips generated, approximately 62.5% of these trips are estimated to occur over a five-day working period. Generally, the number of days worked per week did not seem to be influenced greatly by household income. The current provincial average is slightly below the reported figure of 68.7% in 2014.*

In general, however, these results are consistent with the observation presented in GHTS 2014. Invariably from a transport planning perspective, negative changes in the demand profile of customers tend to constrain trip generation capabilities of households and persons as exhibited by increased number of estimated households with no full-time employment in Table 17: Number of full-time employed persons per household.

Table 35: Days worked per week according to household income

	Weighted number of trips	Number of days worked per week							
Household income		0	1	2	3	4	5	6	7
Nothing	26 892	0.0%	0.0%	0.0%	1.4%	5.6%	66.8%	22.7%	3.5%
R1 - R200	4 819	0.0%	0.0%	14.4%	0.0%	5.6%	25.0%	43.9%	11.1%
R201 - R500	20 674	0.0%	1.4%	4.8%	19.6%	13.9%	36.1%	4.9%	19.2%
R501 - R1000	57 866	0.0%	1.8%	5.5%	20.3%	7.6%	37.7%	13.1%	13.9%
R1001 - R1500	91 883	0.0%	1.4%	2.3%	10.6%	6.4%	51.5%	11.6%	16.2%
R1501 - R2500	163 545	0.2%	0.1%	2.6%	7.4%	5.6%	57.5%	16.4%	10.1%
R2501 - R3500	217 747	0.6%	0.0%	1.0%	6.2%	8.2%	51.1%	16.7%	16.1%
R3501 - R4500	291 332	0.0%	0.2%	1.4%	4.8%	6.8%	57.1%	23.7%	6.0%
R4501 - R6000	348 010	0.1%	0.0%	0.4%	3.2%	9.3%	60.0%	20.6%	6.4%
R6001 - R8000	310 902	0.2%	0.0%	0.3%	1.7%	7.3%	62.4%	21.9%	6.3%
R8001 - R11 000	284 405	0.2%	0.1%	1.1%	3.2%	4.9%	64.6%	21.8%	4.0%
R11 001 - R16 000	290 154	0.1%	0.0%	0.2%	1.9%	6.6%	69.8%	16.8%	4.7%
R16 001 - R30 000	311 854	0.1%	0.0%	0.0%	1.4%	4.2%	70.8%	19.6%	3.8%
R30 001 or More	302 682	0.0%	0.0%	0.0%	1.5%	6.0%	71.7%	11.9%	8.9%
Don't know	355 806	0.0%	0.2%	1.0%	7.8%	5.1%	55.8%	18.8%	11.4%
Refuse to answer	1 055 653	0.1%	0.1%	0.5%	2.2%	4.6%	65.4%	19.3%	7.8%
Total	**4 134 224**	**0.1%***	**0.1%***	**0.5%***	**2.2%***	**4.6%***	**65.4%***	**19.3%***	**7.8%***

Percentage of trips in the respective number of days worked across overall trips

The corresponding trip generation rates per household according to income group and purpose of travel are illustrated inTable 36. Evidently, fluctuations in employment and thus disposable income levels have a direct relationship to trip generation rates used to build network and mobility systems, including forecast traffic demand for various travel purposes.

Table 36: Mean number of trips per household by income group

Household Income	Average number of peak trips	Going home	Going to school	Going to work	Shopping	Other
Nothing	0.55	0.60	1.00	0.78	0.27	0.09
R1 - R200	0.36	0.00	1.00	0.40	0.29	0.11
R201 - R500	0.55	0.58	1.11	0.65	0.31	0.12
R501 - R1000	0.59	0.62	1.01	0.84	0.36	0.11
R1001 - R1500	0.60	0.66	1.03	0.81	0.30	0.19
R1501 - R2500	0.59	0.72	0.98	0.78	0.30	0.17
R2501 - R3500	0.61	0.91	0.95	0.74	0.32	0.15
R3501 - R4500	0.62	0.94	0.93	0.75	0.35	0.11
R4501 - R6000	0.62	0.95	0.94	0.72	0.41	0.09
R6001 - R8000	0.63	0.96	1.01	0.73	0.36	0.08
R8001 - R11 000	0.62	0.97	0.98	0.71	0.34	0.08
R11 001 - R16 000	0.60	0.88	1.00	0.73	0.32	0.06
R16 001 - R30 000	0.62	0.95	1.00	0.82	0.30	0.05
R30 001 or More	0.58	0.55	0.94	0.80	0.54	0.06
Don't know	0.52	0.69	0.94	0.67	0.24	0.07

Refuse to answer	*0.60*	*0.84*	*0.97*	*0.75*	*0.34*	*0.09*
Average number of trips	***0.58***	***0.74***	***0.99***	***0.73***	***0.33***	***0.10***

Error! Reference source not found. *shows the morning peak period trips rates for both the 2014 and 2019 GHTS. Worth noting in the comparison is the consistently low trip generation rates for income levels ranging between and R1–R200 and this suggest that this group tends to rely on walking to access socioeconomic and recreational opportunities. Conversely, significant trip generation rates were estimated for higher income groups i.e. R30 000 + in 2014 however this pattern was not exhibited when compared to 2019 GHTS. This could be as a result of low response rates generated from affluent communities who refused to participate in the survey.*
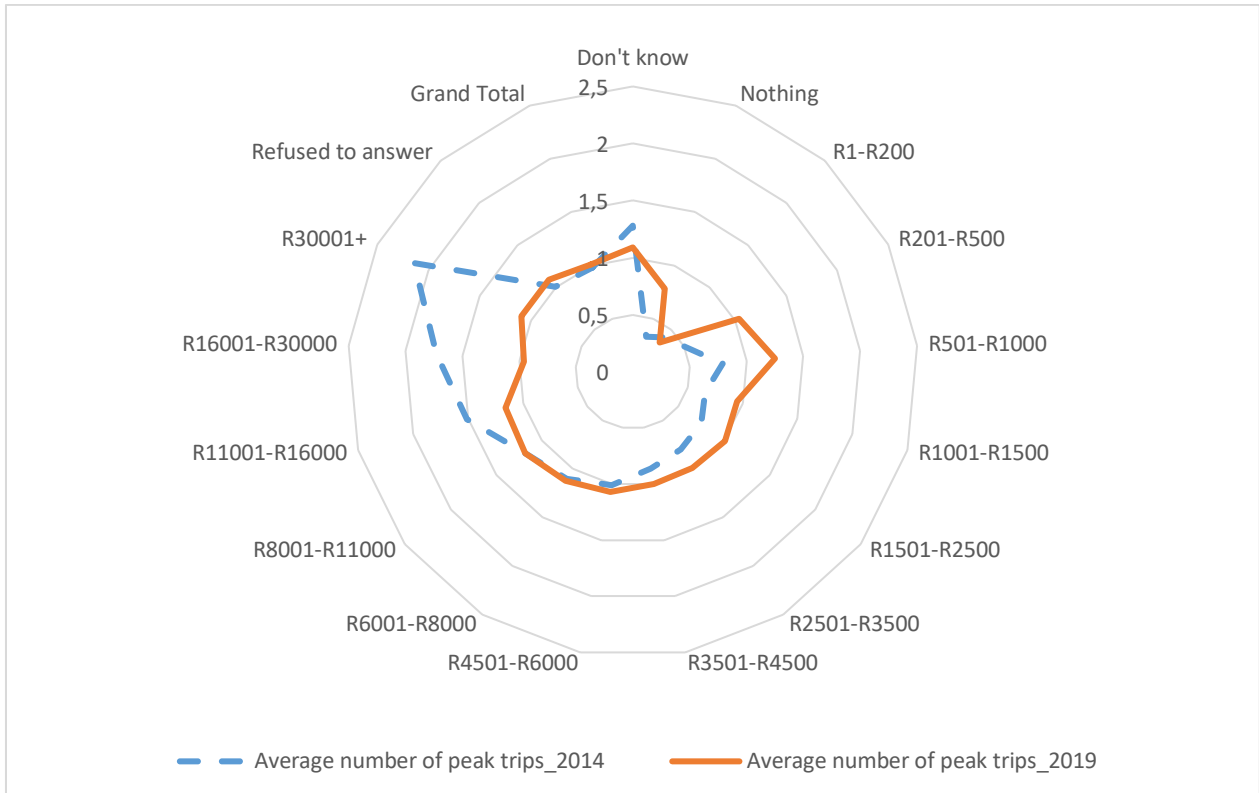
Figure 17: Morning peak-period trip rates by income groups for the 2014 and 2019 travel surveys

Table 37 shows the average household trip generation rates by sub-region in 2019. The aggregated trip generation rate for Gauteng was 0.81 trips per household per day. This was slightly lower than the average trip rate of 0.98 accounted for in the 2014 GHTS. Going home and work-related trip generation rates accounted for a significant proportion of the provincial aggregate at 0.27 and 0.18, respectively.

Table 37: Average number of trips per household by sub-group

Municipality	*Sub region*	*Number of households*	*All trips*	*Going home*	*Going to school*	*Going to work*	*Shopping*	*Other*
City of Johannesburg	*Alexandra / Modderfontein*	*85 877*	*0.78*	*0.50*	*0.04*	*0.14*	*0.03*	*0.08*
	Diepmeadow	*236 243*	*0.76*	*0.25*	*0.04*	*0.22*	*0.09*	*0.17*
	Diepsloot	*94 425*	*0.83*	*0.05*	*0.18*	*0.25*	*0.08*	*0.28*
	Joburg Central	*100 224*	*0.96*	*0.45*	*0.11*	*0.20*	*0.05*	*0.15*
	Joburg South	*93 205*	*0.57*	*0.06*	*0.04*	*0.29*	*0.03*	*0.15*
	Midrand	*197 435*	*0.50*	*0.23*	*0.03*	*0.11*	*0.05*	*0.07*

	Northcliff / Rosebank	98 858	0.99	0.41	0.06	0.29	0.15	0.09
	Orange Farm / Ennerdale	210 861	0.86	0.26	0.04	0.22	0.12	0.23
	Roodepoort	127 713	1.01	0.41	0.06	0.29	0.12	0.12
	Sandton / Randburg	190 398	1.09	0.50	0.06	0.29	0.09	0.16
	Soweto / Doornkop	343 898	0.84	0.25	0.03	0.29	0.08	0.19
City of Tshwane	Akasia / Rosslyn	23 675	0.48	0.10	0.03	0.16	0.11	0.08
	Centurion	124 988	1.13	0.50	0.04	0.30	0.10	0.20
	Bronkhorstspruit Rural East	26 348	1.51	0.62	0.06	0.20	0.15	0.49
	Bronkhorstspruit Rural West	23 350	1.24	0.42	0.05	0.29	0.13	0.35
	Bronkhorstspruit Urban (Bronkhorstspruit core, Zithobeni)	15 246	1.47	0.67	0.06	0.33	0.08	0.33
	Mamelodi / Nellmapius	208 445	1.11	0.46	0.07	0.18	0.12	0.28
	Moot	49 936	1.09	0.48	0.04	0.24	0.11	0.22
	Cullinan Rural	51 777	1.01	0.47	0.05	0.17	0.08	0.23
	Cullinan Urban (Cullinan / Rayton)	48 971	1.47	0.54	0.06	0.15	0.21	0.50
	Pretoria CBD	42 909	1.65	0.71	0.06	0.18	0.18	0.53
	Pretoria East	125 468	1.07	0.41	0.04	0.21	0.09	0.32
	Pretoria North	37 902	0.73	0.27	0.04	0.21	0.07	0.13
	Pretoria West / Atteridgeville	119 615	0.61	0.28	0.01	0.13	0.07	0.11
	Rooiwal	35 155	0.73	0.32	0.05	0.17	0.05	0.14
	Soshanguve	209 450	0.39	0.10	0.04	0.09	0.04	0.13
	Temba, Winterveld, Mabopane, Ga-rankuwa	236 059	0.80	0.30	0.05	0.13	0.10	0.22
	Tshwane West Rural	14 761	0.83	0.29	0.03	0.17	0.12	0.23
Ekurhuleni	Alberton	42 218	1.12	0.45	0.03	0.27	0.13	0.25
	Brakpan / Benoni / Springs	120 744	0.40	0.09	0.03	0.08	0.05	0.15
	Daveyton	81 171	0.51	0.15	0.02	0.11	0.05	0.18
	Ekurhuleni Rural	86 749	0.56	0.18	0.01	0.19	0.05	0.12
	Germiston / Boksburg	189 984	0.68	0.22	0.02	0.16	0.05	0.22
	Katorus	299 022	0.55	0.16	0.03	0.10	0.08	0.19
	Kempton Park / JIA / Boksburg North	218 393	0.57	0.17	0.02	0.22	0.04	0.13
	Kwatsaduza	180 994	0.85	0.26	0.08	0.19	0.12	0.20
	Tembisa / Clayville	189 449	0.56	0.16	0.02	0.12	0.05	0.21
Sedibeng	Emfuleni LM Rural	9 007	0.60	0.06	0.00	0.00	0.11	0.42
	Emfuleni LM Urban (Evaton, VdBP, Vereeniging)	288 005	0.55	0.20	0.02	0.09	0.06	0.19
	Lesedi LM Rural	32 203	0.68	0.01	0.03	0.17	0.13	0.35
	Lesedi LM Urban (Heidelberg / Ratanda)	17 119	0.64	0.00	0.01	0.19	0.14	0.30
	Midvaal LM Rural East	31 911	0.38	0.09	0.02	0.16	0.04	0.07
	Midvaal LM Rural West	27 446	0.29	0.11	0.01	0.09	0.02	0.05
West Rand	Merafong LM	86 620	0.66	0.10	0.03	0.16	0.08	0.29
	Mogale City LM Rural	48 048	0.66	0.09	0.05	0.16	0.14	0.22
	Mogale City LM Urban (Krugersdorp / Kagiso)	126 737	0.58	0.11	0.04	0.16	0.10	0.17
	Randfontein LM Rural	7 228	0.86	0.35	0.08	0.27	0.04	0.12
	Randfontein LM Urban	53 799	0.97	0.22	0.06	0.22	0.13	0.33
	Westonaria LM	54 057	0.70	0.10	0.04	0.21	0.09	0.26
	Grand Total	**5 364 096**	**0.81**	**0.27**	**0.04**	**0.18**	**0.08**	**0.22**

8 PATTERNS ON USE OF AND ATTITUDE TOWARDS PUBLIC TRANSPORT SERVICES

The reporting of commuter perceptions and experience using public transport service is aggregated at a provincial level and reveals Gauteng-specific trends. The regional reports provide a disaggregated detail to locality-specific issues and trends.

Significant limitations were encountered from survey responses to this section of the questionnaire, which impacted on the analysis provided in this section. Most importantly, the larger percentages not discussed are computed from very few responses and therefore do not provide a reliable picture.

Table 38: Levels of satisfaction of bus services based on attributes

Attributes of bus service	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied	Total
Behaviour of bus drivers to passengers	77 (7.5%)	98 (9.5%)	348 (33.9%)	343 (33.4%)	162 (15.8%)	1028
Bus fare	6 (5%)	11 (9.1%)	37 (30.6%)	52 (43%)	15 (12.4%)	121
Bus service overall	2 (5%)	2 (5%)	12 (30%)	15 (37.5%)	9 (22.5%)	40
Distance of bus stop from home	1 (20%)	0 (0%)	2 (40%)	2 (40%)	0 (0%)	5
Distance of bus stop from work	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1
Facilities at bus stop	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1
Level of crowding in bus	4 (5.3%)	11 (14.7%)	24 (32%)	30 (40%)	6 (8%)	75
Off-peak frequency of buses	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1
Security at bus stop	0 (0%)	1 (50%)	1 (50%)	0 (0%)	0 (0%)	2
Total	**90 (7.1%)**	**123 (9.7%)**	**425 (33.4%)**	**444 (34.9%)**	**192 (15.1%)**	**1274**

*The larger percentages not discussed are computed from very few responses and therefore do not provide a reliable picture.

Table 38 shows bus users' overall levels of satisfaction with bus services in Gauteng during the 2019 survey. Roughly half (50%) of bus users were generally satisfied (satisfied/very satisfied) compared to 16.8% of dissatisfied (dissatisfied/very dissatisfied) users.

The 60% main bus attributes that commuters were mostly satisfied with included the overall bus service, followed by bus fare (53%) and the attitude of bus drivers (49%). Even though positive attributes towards driver behaviour were largely expressed, some bus passengers (17%) expressed dissatisfaction with bus driver behaviour. It is worth noting that a relatively large proportion of respondents (33%) were indifferent.

Table 39: Reasons for not used (buses)

Reasons for not using buses	Weighted population size	% of population
No bus available	1 661 958	44.7%
Bus not available often enough	395 300	10.6%
Buses don't go where needed	346 924	9.3%
Buses are crowded	336 459	9.0%
Buses always late	225 688	6.1%
Bus stop too far from home	217 790	5.9%
Bus not available at the right time	217 790	5.9%
Bus stop too far from destination	192 911	5.2%
Bus too expensive	99 121	2.7%
No Knowledge of time table and routes	9 675	0.3%
Prefer taxi	6 516	0.2%
Travel time too long or too slow	4 344	0.1%
Have to change transport	1 975	0.1%
Too much crime/dangerous	790	0.0%
Prefer private transport	790	0.0%
Other	592	0.0%
Total	**3 718 623**	**100.0%**

Table 39 shows the reasons disclosed by respondents for not using bus services in the province. The dominating reasons expressed were the unavailability of a bus (just above 48%), unavailability of a bus often enough (11%), and buses not going where needed (8.7%), followed by buses being crowded (8.3%).

Table 40: Attributes of taxi service

Attributes of taxi service	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Behaviour of the taxi drivers to passengers	17.4	19.8	35.9	21.6	5.4
Distance of the taxi stop from home	11.2	22.6	25.1	30.5	10.7
Distance of the taxi stop from work	17.2	16.6	31.7	24.1	10.3
Facilities at the taxi ranks or stops	15.8	11.7	35.8	30.8	5.8
Level of crowding in the taxi	18.2	18.2	54.5	9.1	0.0
Off-peak frequency of taxis	40.0	0.0	20.0	40.0	0.0
Peak-period frequency of taxis	27.6	15.8	34.2	19.7	2.6
Perceived accidents of the taxi	0.0	100.0	0.0	0.0	0.0
Punctuality of taxis	0.0	0.0	0.0	0.0	100.0
Security in the taxi	100.0	0.0	0.0	0.0	0.0

Security on walk to taxi	38.5	23.1	30.8	7.7	0.0
Waiting time for taxis	0.0	50.0	50.0	0.0	0.0
% Total	**16.6**	**20.0**	**34.2**	**23.0**	**6.3**

Generally, taxi users expressed dissatisfaction with taxi services, while some could not commit to either the positive or the negative attributes assessment. The dissatisfied users expressed unhappiness with the behaviour of taxi drivers (37%) as compared to those who have no issues (27%) with taxi driver behaviour. A reasonable percentage (almost 35%) was, however, satisfied with the distance between their homes and taxi stop.

Table 41: Reasons for not using taxi

Reasons for not using taxis	Number people	Weighted population size	% of population
Taxi too expensive	61	12 045	37.2%
Taxis are crowded	23	4 541	14.0%
Taxi stop too far from home	11	2 172	6.7%
Taxis don't go where needed	11	2 172	6.7%
Taxi not available at the right time	10	1 975	6.1%
Taxi not available often enough	10	1 975	6.1%
Taxis always late	10	1 975	6.1%
Taxis not roadworthy	8	1 580	4.9%
No taxi available	6	1 185	3.7%
Taxi stop too far from destination	6	1 185	3.7%
Prefer train	4	790	2.4%
Prefer private transport	2	395	1.2%
Too much crime or dangerous	1	197	0.6%
Travel time to long or too slow	1	197	0.6%
Total	**164**	**32 384**	**100.0%**

Table 41 shows the reasons that respondents disclosed for not using minibus taxis. The dominant reasons related to a) taxis are too expensive (30%) and b) overcrowding (15%).

Table 42: Attributes of train services

Attributes of train services	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Distance of station from home	9.09	25.25	32.83	25.25	7.58
Distance of station from work	5.00	10.00	25.00	15.00	45.00
Facilities at stations	50.00	0.00	50.00	0.00	0.00
Perceived accidents of the train	0.00	0.00	0.00	100.00	0.00
% Total	**9.05**	**23.53**	**32.13**	**24.43**	**10.86**

Of the users that showed some level of dissatisfaction, most were dissatisfied with the facilities at the stations, while most of those who were satisfied indicated satisfaction with low perceived accidents in trains. Most users were 'neutral' with regard to the distances from station to home or station to work.

Table 43: Reason for not using train

Reasons for not using trains	Number people	Weighted population size	% of population
No train available at all	218	43 045	27.6%
Train stop too far from home	111	21 917	14.1%
Trains are crowded	77	15 204	9.7%
Too much crime or dangerous	65	12 834	8.2%
Trains always late	53	10 465	6.7%
Prefer taxi	48	9 478	6.1%
Train stop too far from destination	39	7 701	4.9%
Trains don't go where needed	36	7 108	4.6%
Travel time to long or too slow	36	7 108	4.6%
Train not available often enough	35	6 911	4.4%
Train not available at the right time	32	6 318	4.1%
Train too expensive	11	2 172	1.4%
Have to change transport	10	1 975	1.3%
Too many accidents	7	1 382	0.9%
Other	6	1 185	0.8%
Prefer private transport	6	1 185	0.8%
Total	**790**	**155 988**	**100.0%**

Table 43 shows the reasons that respondents disclosed for not using trains. The bulk of users (27.6%) indicated that there were no trains available at all, 14.1% pointed out that trains stop too far from home, and 9.7% cited crowding of trains as a reason for not using this mode.

9 Recommendations

Numerous challenges were encountered during field work, which impacted on the quality of responses. In particular, surveyor fatigue for long interviews in larger households, crime prevalence, and refusals to participate had a negative impact on the outcomes of the survey.

There is an emerging school of thought that future GHTSs may need to be modified to focus more on capturing transport and public transport-specific information and allow for an accurate capturing of person trips using modern technological platforms to track and digitally map patterns. Specific demographic statistics can be solicited from various secondary data providers, which can save resources and enable enhanced focus on travel patterns to boost forecasting and modelling capabilities of existing planning tools.

It is therefore recommended that future surveys maximise the use of mobile technology to improve the quality, versatility and quantity of responses.

10 CONCLUSIONS

This report provides a summary of statistical information generated from the 2019 GHTS. The information presented in this report includes household and demographic characteristics, travel patterns, trip characteristics together with perceptions and attitudes of users towards various transport modes. The complete datasets for third-party access will be made available in seeking to encourage the planning and academic fraternity to engage with the datasets for respective purposes.

The following findings are noteworthy:

- *Average household sizes have generally decreased from three-person households to two-person households.*
- *Single-person households are on the rise.*
- *Number of non-car-owning households increased.*
- *A significant proportion of household income is spent on commuting.*
- *Low capacity mobility modes, i.e. minibus taxi and private car, continue to absorb increasing demand.*
- *Private car use leads motorised share split.*
- *Household trip generation rates have declined with declining employed households.*
- *Public transport mode share is dominated by minibus taxis.*
- *Average travel time has doubled over the past 20 years, and increased substantially by 17% from the 2014 figures.*
- *The dominant mode of travel for commuting is walking all the way.*
- *Access time to public transport has increased.*
- *A third of workers do not work the usual five days a week.*
- *Substantial latent demand exists for public transport as most households perceived higher capacity public transport modes as mostly being inaccessible and unavailable.*
- *Travel demand is sensitive to travel time and cost changes as exhibited by reduced trips and employed households, including their respective distribution of morning peak departure times.*
- *Of all the inter-municipal corridors, the West Rand and the CoJ corridor was estimated to have the largest density of travel demand in contrast to highest density in 2014, which was between the CoE and the CoJ .*

11 References

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12 Annexures

Table 44: The main residential classes of the residential point dataset

Class no.	Class name	Class description
7	Residential	Residential
7.1	Formal	Freehold formal houses
7.2	Informal	Informal structures
7.2.1	Informal	All informal housing structures
7.2.2	Transitional	Housing structures that are difficult to classify as either informal or formal
7.2.3	Backyard structures	All backyard structures associated with formal housing that may be used for housing purposes (formal or informal)
7.3	Cluster/complexes	Cluster/complexes
7.3.1	Flats	Typical flats, includes single or more levels of flats above commercial buildings
7.3.2	Hostels	Mainly worker hostels, typical or mining areas, etc.
7.3.4	Townhouses	Include townhouses and housing complexes
7.3.5	Duet	Formal duet housing
7.4	Estates	Smallholdings/agriculture
7.4.1	Estate gate ID	Point placed at the estate gate with the name (no unit count)
7.4.2	Estate housing	Every individual estate house receives a point with the estate name
7.5	Security villages	Security estates
7.5.1	Security village gate	Point placed at the security village gate with the name (no unit count)
7.5.2	Security village housing	Every individual security village house received a point with the village name
7.6	Smallholdings/agriculture	Small holdings/agriculture
7.6.1	Smallholdings	Smallholding housing units (excludes labour housing)
7.6.2	Farmsteads	Farmstead housing unit (excludes labour housing)
7.7	Rural workers' housing	Includes all rural workers' housing on smallholdings, farms, forestry areas, etc.
7.8	Villages	Villages as found in mainly KwaZulu-Natal and Eastern Cape provinces

SURVEY QUESTIONNAIRE

PARTICULARS OF THE DWELLING

1   Number of dwelling units on this stand

……………….. **Select dwelling**
1.1

1.2   Indicate the type of main dwelling that the household occupies: (*Drop-down list*)

1.	Dwelling/house or brick/concrete block structure on a separate stand or yard or on farm
2.	Traditional dwelling/hut/structure made of traditional materials
3.	Flat or apartment in a block of flats
4.	Cluster house in complex
5.	Town house (semi-detached house in complex)
6.	Semi-detached house
7.	Dwelling/house/flat/room in backyard
8.	Informal dwelling/shack in backyard
9.	Informal dwelling/shack not in backyard, e.g. in an informal/squatter settlement or on farm
10.	Room/flatlet on a property or a larger dwelling/servant's quarters/granny flat
11.	Hostel – Family unit
12.	Hostel – Students
13.	Hostel – Single gender
14.	Caravan/tent
15.	Other (Specify)

2   Dwelling unit number of selected dwelling unit

……………….. (*generated by program*)

3   Total number of households at selected dwelling unit

……………….. **Select dwelling**

4   Household number of selected household

……………….. (*generated by program*)

5   Preferred method of contact for selected household

………………..

1 HOUSEHOLD INFORMATION (ALL QUESTIONS IN 1 ARE ANSWERED BY MAIN RESPONDENT)

1.1   Are you the head of the household?

O   Yes

O   No

1.2   How many people in total (including yourself) usually stay in this household for at least four nights per week?

RECORD ONE NUMERICAL ANSWER

………………..

1.2.1   Is there any other person usually residing in this household, for at least four nights a week, other than those already mentioned?

1   HOUSEHOLD INFORMATION (ALL QUESTIONS IN 1 ARE ANSWERED BY MAIN RESPONDENT)

1.4   From your home, how long do you think it will take me to walk to the nearest bus stop?
And to the nearest taxi service/rank?
And to the nearest train station?
RECORD ONE NUMERICAL ANSWER IN MINUTES FOR EACH SERVICE

Mode	Minutes	Don't know	No service
Bus			
Taxi			
Train Station			

1.5   How do members of your household get to the nearest of each of the following facilities?
And how long does it take to get there in minutes (from this household to the facility, door to door)?

(IF MORE THAN ONE MEMBER OF THE HOUSEHOLD TRAVEL TO A FACILITY, RECORD THE TYPE OF TRANSPORT USED BY THE PERSON WHO GOES THERE MOST OFTEN. IF MORE THAN ONE TYPE OF TRANSPORT IS USED, MARK THE ONE USED OVER THE LONGEST DISTANCE) (__MARK ONLY ONE MODE FOR EACH FACILITY__)

Drop-down list: *Walk, Train, Gautrain, Bus, Gautrain bus, Taxi, Metered taxi, Car/Bakkie/,Truck/Lorry, Tractor/Trailer, Motorcycle/Scooter, Bicycle, Can't get there, Do not need to go there*

Service	Mode	Minutes
Grocery shop		
Other shops		

ATMs/banks		
Medical services (health services)		
Post office/agent		
Welfare (social services e.g. SASSA) office		
Police station		
Municipal office		
Tribal authority		
Community hall		
Communal water point		
Others		

1 HOUSEHOLD INFORMATION (ALL QUESTIONS IN 1 ARE ANSWERED BY MAIN RESPONDENT)

1.6 How many of the following vehicles (in working order) do members of this household have available for private use?

Vehicle	Quantity
Bicycles	
Motor cycles and motorised scooters	
Cars/bakkies/station-wagons/combis owned by employer/company	
Cars/bakkies/station wagons/combis owned by household	
Other Specify	

1.7 What are the sources of income for this household?

READ ALL THE OPTIONS – MULTIPLE RESPONSES POSSIBLE

☐ Salaries/wages/commission ☐ Income from own business

☐ Remittances, including child maintenance ☐ Pensions

☐ Grants ☐ Sales of farming products and services

☐ Income from UIF ☐ Other income sources, e.g. rental income, interest

1.8 Which one of the above income sources usually provides the most money for the household? (CHOOSE ONLY ONE SOURCE)

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Drop-down list:
Salaries/wages/commission
Income from own business
Remittances, including child maintenance
Pensions
Grants
Sales of farming products and services
Income from UIF
Other income sources e.g. rental income, interest

1.9 (SHOW CARD) What is the total monthly income in a typical month for this household? Include the salaries, wages, pensions and other income (such as interest and rent) for all members of the household before deductions.

Drop-down list

1. Nothing
2. R 1 – R 200
3. R 201 – R 500
4. R 501 – R 1000
5. R 1 001 – R 1 500
6. R 1 501 – R 2 500
7. R 2 501 – R 3 500
8. R 3 501 – R 4 500
9. R 4 501 – R 6 000
10. R 6 001 – R 8 000
11. R 8 001 – R 11 000
12. R 11 001 – R 16 000
13. R 16 001 – R 30 000
14. R 30 001 or more
15. Don't know
16. Refused

1.10 What is this household's monthly expenditure on public transport in a typical month for the following purposes? (Include the expenditure of all household members)

Work   …………..
Education …………..
Other   …………..
Total   …………..

The total monthly expenditure for public transport is: _____. Is that correct?

2. PARTICULARS OF EACH OF THE .... PERSONS IN THE HOUSEHOLD

Add person

2.1 First Name				
2.2 Surname				
2.3 Gender				
2.4 Age (in completed years)				
2.5 Race				

Delete person	Delete person	Delete person	Delete person
Interview Person	Interview Person	Interview Person	Interview Person
Interview done	Interview done	Interview done	Interview done

2.3 *Drop-down list* Gender
    Male
    Female
2.4 Drop-down list Age
    0-1 years = 0
    888 = Refused to answer
    999 = Don't know
2.5 *Drop-down list* Race
    Black/African
    Coloured
    Indian/Asian
    White
    Other Specify
    Refused to answer

2.6 Do you/ does…… (HOUSEHOLD MEMBER NAME) have any condition that **limits their ability to travel**? IF NO, SKIP TO QUESTION 2.9

O   Yes

O   No

2.7 What is the nature of the condition?

	Blind/severe visual limitations		Deaf, profoundly hard of hearing
	Needs wheel chair		Uses crutches/walking stick/can't walk far
	Has problems with stairs		Mentally handicapped
	Travels with small children and/or baby		Other Specify
	Not applicable		

2.8 What is the highest level of education that you /…(HOUSEHOLD MEMBER NAME) have successfully completed?

    None

    Some primary school

    Primary school complete (Grade 7 or Standard 5)

    Some high school

    High school complete (Grade 12 or Standard 10)

    Some university/college

    Diploma with less than Grade 12

    Degree or Diploma with Grade 12

    Other post-matric qualification (specify)

    Other Specify

2.10   Do you/does ….. (HOUSEHOLD MEMBER NAME) have a driver's license?

Drop-down list
No
Yes
Not applicable

2.10.1 Which of the following licence type do you have (can choose more than one option)?

	A/A1 (motorcycle)		B (car)
	C / C1 (Small Truck)		EB/EC/EC1
	PrDP (Professional Driving Permit)		Other, specify

2.11   What is your …..(HOUSEHOLD MEMBER NAME)'s main occupation?

Drop-down list

    Full-time worker

    Part-time worker

    Unemployed, would like to work

    Unable to work (chronically ill/mentally handicapped/physically handicapped)

    Pensioner/retired

    Housewife/husband

    Student at university or college (post-matric)

    High school learner

    Primary school learner

    Child attending pre-school/nursery school/crèche/day-mother

    Child staying at home

    Other Specify

3.   EMPLOYED (BUSINESS)

3.1   Do you/does …have a job/run a business or did he/she do any work in the past seven days, even if he/she was absent from work due to leave or illness?

Drop-down list
Yes – formal sector (registered)
Yes – informal sector
No
 Not applicable

3.2   Do you/does … work for ……..?

Yourself
Another organisation/person
Not applicable

3.2.1   Do you/ does ….. work from home?

Drop-down list
Yes
No
Not applicable

3.3   In which industrial sector are you/ is …… employed or running a business?

Drop-down list

Agriculture, forestry and fishing
Mining/quarrying
Electricity, gas or water supply
Construction
Tourism/hospitality
Wholesale & retail
Transport, storage & communication
Financial, insurance and business services
Services, including government
Domestic work
Other Specify

3.4   What is your/ …'s occupation category?

Drop-down list
 Managers
 Professionals
 Technician and trade workers
 Machine operators and drivers
 Sales workers
 Labourers
 Community and personal service workers
 Clerical and administrative workers

Other Specify
Not applicable

3.6 What is the full physical address of your/…..'s employer/business?

Enter address IF THE RESPONDENT WORKS AT DIFFERENT PLACES ON DIFFERENT DAYS, RECORD THE ADDRESS OF THE PLACE WHERE HE/SHE WORKED ON TRAVEL DAY. IF HE/SHE DID NOT GO TO WORK ON TRAVEL DAY, RECORD THE ADDRESS OF THE PLACE WHERE HE/SHE WORKS MOST OFTEN

3.7 How many days per week do you/ does …..usually work?

…………
999 = Not applicable

3.8 Do you have/does ….fixed or flexible working hours?

Drop-down list
Fixed
Flexible
Not applicable

3.9 At what time do you/ does …. usually start work?

………… **:** ………… AM/PM

3.10 At what time do you/ does …. usually end work?

………… **:** ………… AM/PM

3.11 What is your/ …'s total salary/pay/earnings at your/his/her <u>main</u> job? Choose per week, per month or per year *(SHOW CARD)*

Choose weekly		Choose monthly		Choose annually	
1.	None	1.	None	1.	None
2.	R1 – R46	2.	R1 – R200	2.	1 – R2 400
3.	R47 – R115	3.	R201 – R500	3.	R2 401 – R6 000
4.	R116 - R231	4.	R501 – R1 000	4.	R6 001 – R12 000
5.	R232 - R346	5.	R1 001 – R1 500	5.	R12 001 – R18 000
6.	R347 - R577	6.	R1 501 – R2 500	6.	R18 001 – R30 000
7.	R578 - R808	7.	R2 501 – R3 500	7.	R30 001 – R42 000
8.	R809 - R1 039	8.	R3 501 – R4 500	8.	R42 001 – R54 000
9.	R1 040 - R1 386	9.	R4 501 - R6 000	9.	R54 001 – R72 000
10.	R1 387 - R1 848	10.	R6 001 – R8 000	10.	R72 001 – R96 000
11.	R1 849 - R2 540	11.	R8 001 – R11 000	11.	R96 001 – R132 000
12.	R2 541 - R3 695	12.	R11 001 – R16 000	12.	R132 001 – R192 000
13.	R3 696 - R6 928	13.	R16 001 – R30 000	13.	R192 001 – R360 000
14.	R6 929 OR MORE	14.	R30 001 OR MORE	14.	R360 001 OR MORE
15.	Don't know	15.	Don't know	15.	Don't know
16.	Refuse	16.	Refuse	16.	Refuse

3.12   Does your/…'s employer/business give you/him/her an allowance to cover transport costs, e.g. cash for public transport tickets, car allowance or fuel coupons?

Drop-down list
Yes
No
Not applicable

3.12.1. If any, what type of allowance or support do you/does…. receive from employer/business?

3.13   How much is this worth per month?

R…………..

-999 = Not applicable

4.   LEARNER

4.1   Name of pre-school/school/college/university

………………………………………………….

4.2   Address of pre-school/school/college/ university

Enter address

4.3   How many days a week is pre-school/school/college/university attended?

…………………

4.4   Start time of pre-school/school/college/university

………… : ………… AM/PM

4.5   End time of pre-school/school/college/ university

………… : ………… AM/PM

5.   GENERAL TRIP INFORMATION

5.0.   Thinking of …………………, where were you/…. at 3 AM?

Drop-down list
Home
Work
Other

5.1   Did you/ ……   leave the premises (…..) any time on …….. to go somewhere else, such as going to work, home, school or shops or to visit a friend?

Drop-down list

Yes
No

5.2   What is the main reason why…….. did not make any trips/travel on …………..?

Drop-down list
        Did not need to travel
        Usual transport not available
        No available public transport
        Disabled: transport inaccessible
        Public transport too expensive
        Public transport too far
        Strike action/Conflict in transport sector
        Unwell, sick
        Leave
        Other (specify)

5.3   Is …. available to answer questions about her/his trips on ……………..?
        Drop-down list
        Yes
        No

PLEASE TELL ME WHERE YOU WENT ON TRAVEL DAY (DO NOT SKIP ANYTHING, EVEN IF YOU DO NOT THINK IT IS IMPORTANT) SUMMARISE ALL THE PLACES THAT ALL HOUSEHOLD MEMBERS WENT TO ON THE TRAVEL DAY. THE RESPONDENT WOULD USUALLY RETURN TO THE PLACE WHERE THE FIRST TRIP STARTED.

USE THE TRIP AID DOCUMENT

TRIP	Person 1 Name:	Person 2 Name:	Person 3 Name:	Person 4 Name:	Person 5 Name:	Person 6 Name:	Person 7 Name:	Person 8 Name:	Person 9 Name:
First departure point									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

5. **PERSONAL TRIP INFORMATION**

| + Add trip | X Remove last trip | ← Previous trip | Next trip → |

5.4   Where did the trip start?

Drop-down list
Home
Usual workplace
Work place
Educational institution
Friend/relative's house
Recreational place
Health centre
Place of worship
Welfare offices
Other government offices
Shops/shopping centre
Other Specify

5.5   Please give the name and physical address of the place where the trip started

…………….. **Enter address**

5.6   At what time did you leave there?

………… **:** ………… AM/PM

5.7   Where did the trip end?

Drop-down list
Home
Usual workplace
Work place
Educational institution
Friend/relative's house
Recreational place
Health centre
Place of worship
Welfare offices
Other Government offices
Shops/shopping centre
Other Specify

5.8   Please give the name and physical address of where the trip ended

…………….. **Enter address**

5.9   At what time did you arrive there?

………… **:** ………… AM/PM

5.10   What were the modes of transport for the trip in order of use?

Choose mode of transport 1   Choose mode of transport 2   Choose mode of transport 3
Choose mode of transport 4   Choose mode of transport 5   Choose mode of transport 6

Walk all the way
Commuter taxi/minibus taxi
Bus (BRT/Rea Vaya)
School bus
Bus (other)
Gautrain bus
Train
Gautrain
Company transport
Metered taxi
Lift club driver
Lift club passenger
Car, as driver
Car, as passenger
Motor cycle
Bicycle
Other Specify

5.11   What was the main purpose of the trip?

Drop-down list
Work at usual workplace
In the course of work, but not at usual workplace
Visiting friends/relatives
To drop someone off/ to pick someone up
Educational
Shopping
Looking for work
Medical/health purposes
Traditional healer
Welfare offices
Recreational
To go home
Worship
Other Specify

5.12   How much do you pay for each mode? R.................

HERE ASK FOR ANSWER IN UNITS (RANDS)

Include the options "I do not pay (meaning "free" travel)" coded as -888 and "Not applicable (meaning no out of pocket costs expected)" coded as -999

5.13   Unit of payment

Drop-down list of possible answers:
Per single trip
Per return trip
Per week
Per month
Not applicable

5.14   How long (in minutes) did you walk at the start of the trip (to your first transport)?

…………

5.15   How long (in minutes) did you walk at the end of the trip (from your last transport to your destination)?

        ……….

5.16   State whether the information was provided in person or by another household member?

        Drop-down list
        In person
        Another household member

5.17   Did you/he/she go anywhere else after that?

        Drop-down list
        Yes
        No

ATTITUDES/PERCEPTIONS/STATED PREFERENCE SECTION (THIS SECTION OF THE QUESTIONNAIRE IS TO GAUGE THE TRADE-OFFS DONE BY PUBLIC TRANSPORT USERS)

5.18 If there were disruptions in the transport system, how else would you have travelled for the main purpose trip? What would be the modes of transport for the trip in order of use?

        Choose mode of transport 1   Choose mode of transport 2   Choose mode of transport 3
        Choose mode of transport 4   Stranded

5.19 How long in minutes would the trip had taken using the alternative option?

5.20   How much would you pay for each of the alternative modes? R................

HERE ASK FOR ANSWER IN UNITS (RANDS)

Include the options "I do not pay" (meaning free travel) coded as -888 and "Not applicable" (meaning no out of pocket costs expected) coded as -999

5.21   Unit of payment

Drop-down list of possible answers:
Per single trip
Per return trip
Per week
Per month
Not applicable

5.22   How long (in minutes) would you walk at the start of the trip (to your first transport)?

        …………

5.23   How long (in minutes) would you walk at the end of the trip (from your last transport to your destination)?

5.24   What are the <u>two</u> most important transport problems experienced by this household?

Problem1………
……………………………………….

Problem2………
……………………………………….

OPEN ENDED – PROBE THOROUGHLY (SEEK A "MODE-RELATED" ANSWER AS FAR AS POSSIBLE, E.G. "TAXIS ARE EXPENSIVE" INSTEAD OF "TRANSPORT IS EXPENSIVE")

RECORD ONLY ONE ANSWER IN EACH SPACE

IF THE RESPONDENT HAS NO PROBLEMS, RECORD NONE FOR PROBLEM 1

6. SATISFACTION WITH ATTRIBUTES OF BUSES, RAIL AND TAXIS

INTERVIEW THE HEAD OF THE HOUSEHOLD IF EMPLOYED, OTHERWISE SELECT ONE EMPLOYED HOUSEHOLD MEMBER AT HOME AT THE TIME OF THE INTERVIEW, TO RESPOND. IF NOBODY IN THE HOUSEHOLD WORKS, INTERVIEW ANY ADULT.

6.0   Select the name of the respondent of Section 6 of the questionnaire

        …………………

6.1   Have you used a publicly operated BUS in the past month?

        Drop-down list
        Yes
        No

6.1.1   (SHOW CARD) Thinking about your recent *BUS* trip or trips, how satisfied are you with the …
        READ OUT EACH ATTRIBUTE IN TURN AND RECORD ONE ANSWER FOR EACH

Distance of bus stop from home	Choose satisfaction level	*Drop-down list*
Distance of bus stop from work	Choose satisfaction level	Very satisfied
Travel time in the bus	Choose satisfaction level	
Security on walk to bus	Choose satisfaction level	Satisfied
Security at the bus rank or bus stops	Choose satisfaction level	Neither satisfied nor dissatisfied
Security on the bus	Choose satisfaction level	
Level of crowding in the bus	Choose satisfaction level	Dissatisfied
Safety from accidents when traveling by bus	Choose satisfaction level	Very dissatisfied
Peak-period frequency of buses	Choose satisfaction level	
Off-peak frequency of buses	Choose satisfaction level	
Punctuality of buses	Choose satisfaction level	
Bus fares	Choose satisfaction level	
Facilities at bus ranks or bus stops	Choose satisfaction level	
Roadworthiness of buses	Choose satisfaction level	
Behaviour of bus drivers towards passengers	Choose satisfaction level	
Bus service overall	Choose satisfaction level	

6.1.2   How important are the following to you?

Distance of bus stop from home	Choose importance level	*Drop-down list*
Distance of bus stop from work	Choose importance level	Very important
Travel time in the bus	Choose importance level	Important
Security on walk to bus	Choose importance level	Not important
Security at the bus rank or bus stops	Choose importance level	
Security on the bus	Choose importance level	
Level of crowding in the bus	Choose importance level	
Safety from accidents when traveling by bus	Choose importance level	
Peak-period frequency of buses	Choose importance level	
Off-peak frequency of buses	Choose importance level	
Punctuality of buses	Choose importance level	
Bus fares	Choose importance level	
Facilities at bus ranks or bus stops	Choose importance level	
Roadworthiness of buses	Choose importance level	
Behaviour of bus drivers towards passengers	Choose importance level	
Overall quality of bus service	Choose importance level	

6.1.3   Give two reasons why you did not use a BUS in the past month?

…………………………………

Drop-down list
- No bus available at all
- Bus not available often enough
- Bus not available at the right times
- Bus too expensive
- Too much crime (too dangerous)
- Travel time to long/too slow
- Buses too crowded
- Buses always late
- Buses don't go where needed
- Bus stop too far from home
- Bus stop too far from destination
- Have to change transport (transfer)
- No knowledge of timetable and routes
- Too many accidents
- Prefer private transport
- Prefer taxi
- Prefer train
- Can walk
- Too many accidents

Other Specify

6.2   Have you used a TAXI during the past month?

Drop-down list
Yes
No

6.2.1   (SHOW CARD) Thinking about your recent *TAXI* trip or trips, how satisfied are you with the …
        READ OUT EACH ATTRIBUTE IN TURN AND RECORD ONE ANSWER FOR EACH

Distance of taxi service from home	Choose satisfaction level	*Drop-down list*
Distance of taxi service from work	Choose satisfaction level	Very satisfied
Travel time in the taxi	Choose satisfaction level	Satisfied
Security on walk to taxi	Choose satisfaction level	Neither satisfied nor dissatisfied
Security at ranks/stops	Choose satisfaction level	Dissatisfied
Security in the taxi	Choose satisfaction level	Very dissatisfied
Level of crowding in the taxi	Choose satisfaction level	
Safety from accidents when traveling in the taxi	Choose satisfaction level	
Peak-period frequency of taxis	Choose satisfaction level	
Off-peak frequency of taxis	Choose satisfaction level	
Waiting time for taxis	Choose satisfaction level	
Taxi fares	Choose satisfaction level	
Facilities at taxi ranks	Choose satisfaction level	
Roadworthiness of taxis	Choose satisfaction level	
Behaviour of taxi drivers towards passengers	Choose satisfaction level	
Taxi service overall	Choose satisfaction level	

6.2.2   How important are the following to you?

Distance of taxi service from home	Choose importance level	*Drop-down list*
Distance of taxi service from work	Choose importance level	Very important
Travel time in the taxi	Choose importance level	Important
Security on walk to taxi	Choose importance level	Not important
Security at ranks/stops	Choose importance level	
Security in the taxi	Choose importance level	
Level of crowding in the taxi	Choose importance level	
Safety from accidents when traveling in the taxi	Choose importance level	
Peak-period frequency of taxis	Choose importance level	
Off-peak frequency of taxis	Choose importance level	

Waiting time for taxis	Choose importance level
Taxi fares	Choose importance level
Facilities at taxi ranks	Choose importance level
Roadworthiness of taxis	Choose importance level
Behaviour of taxi drivers towards passengers	Choose importance level
Overall quality of taxi service	Choose importance level

6.2.3   Give two reasons why you did not use a TAXI in the past month?

………………………………………

Drop-down list
  No taxis available at all
  Taxis not available often enough
  Taxis not available at the right times
  Taxis too expensive
  Too much crime (too dangerous)
  Travel time too long
  Taxis too crowded
  Have to wait too long for/in taxis
  Taxis don't go where needed
  Taxis too far from home
  Too much violence/wars
  Have to pay cash
  Drivers are rude
  Taxis not roadworthy
  Too many accidents
  Drivers drive recklessly
  Prefer private transport
  Prefer train
  Prefer bus
  Other Specify

6.3   Have you used a TRAIN during the past month?

Drop-down list
Yes
No

6.3.1   (SHOW CARD) Thinking about your recent *TRAIN* trip or trips, how satisfied are you with the …

READ OUT EACH ATTRIBUTE IN TURN AND RECORD ONE ANSWER FOR EACH

		Drop-down list
Distance of station from home	Choose satisfaction level	
Distance of station from work	Choose satisfaction level	Very satisfied
Travel time by train	Choose satisfaction level	Satisfied
Security on the walk to/from the station	Choose satisfaction level	Neither satisfied nor dissatisfied
Security at the station	Choose satisfaction level	Dissatisfied
Security on the train	Choose satisfaction level	Very dissatisfied
The level of crowding in the train	Choose satisfaction level	
Safety from accidents	Choose satisfaction level	
Peak-period frequency of trains	Choose satisfaction level	
Off-peak frequency of trains	Choose satisfaction level	
Punctuality of trains	Choose satisfaction level	
Train fares	Choose satisfaction level	

Facilities at stations	Choose satisfaction level
The train service overall	Choose satisfaction level

6.3.2 How important are the following to you?

Distance of station from home	Choose importance level	*Drop-down list*	
Distance of station from work	Choose importance level	Very important	
Travel time by train	Choose importance level	Important	
Security on the walk to/from the station	Choose importance level	Not important	
Security at the station	Choose importance level		
Security on the train	Choose importance level		
The level of crowding in the train	Choose importance level		
Safety from accidents	Choose importance level		
Peak-period frequency of trains	Choose importance level		
Off-peak frequency of trains	Choose importance level		
Punctuality of trains	Choose importance level		
Train fares	Choose importance level		
Facilities at stations	Choose importance level		
Overall quality of the train service	Choose importance level		

6.3.3 Give two reasons why you did not use a TRAIN in the past month?

……………………………………

……………………………………

Drop-down list

No train available at all

Train not available often enough

Train not available at the right times

Train too expensive

Too much crime (Too dangerous)

Travel time to long/Too slow

Trains too crowded

Trains always late

Trains don't go where needed

Station too far from home

Station too far from destination

Have to change transport (transfer)

No knowledge of timetable and routes

Prefer private transport

Prefer taxi

Prefer bus

Can walk

Other Specify

6.4 In your opinion, how should public transport be improved in your area?

Drop-down list
1   Must be more affordable
2   Improved security (security from crime)
3   Improved safety (safety from accidents)
4   Must be reliable/punctual/show up on time
5   More regular/frequent
6   Direct services from origin to destination (don't want to change bus/train/taxi en route)
7   Services must be made available
8   Vehicles must be roadworthy/ in good condition
9   More services in the off-peak periods (day and night off peak)
10 Must cater for my physical limitations (disability/age etc.)
11 Travel time should be lower
12 Other
888   N/A; Missing; Don't know; Refused
999   NONE - do not use public transport

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