Road Traffic Management Corporation

FATAL TRUCK AND BUS CRASHES IN SOUTH AFRICA

March 2023

ARRIVE ALIVE

DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030

'Safe roads in South Africa'

The Road Traffic Management Corporation (RTMC) is an Agency of the Department of Transport (DoT) and a Member of the United Nations Road Safety Collaboration

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ACRONYMS AND ABBREVIATIONS

ABBREVIATION / ACRONYM	INTERPRETATION
CoC	Cost of Crashes
GVM	Gross Vehicle Mass
NaTIS	National Traffic Information System
NCDMS	National Crash Data Management System
NRSS	National Road Safety Strategy (2016-2030)
NRTA	National Road Traffic Act, Act 93 of 1996
POPIA	Protection of Personal Information Act, Act 4 of 2013
RTI	Road Traffic Information
RTI&T	Road Traffic Information & Technology
RTMC	Road Traffic Management Corporation
SA	South Africa
SAPS	South African Police Service
Self-propelled Vehicle	Self-propelled vehicle means a vehicle propelled by its own engine or motor. "Self-propelled vehicle" includes, but is not limited to, all-terrain vehicles, autocycles, low-speed electric vehicles, low-speed gas vehicles, mopeds, motor driven cycles and motorcycles.
SORSR	RTMC State of Road Safety Report
UNDA	United Nations Decade of Action

1 INTRODUCTION

Road crash data analysis is needed within the traffic management system to plan and action measures to reduce death and serious injury due to road crashes. The aim of this report is to provide crash data analysis on trucks and buses involved in fatal crashes in South Africa. The analysis output provides an overview of the fatal crashes, vehicle types involved in fatal crashes per province and further interrogates various parameters regarding trucks and buses involved in fatal crashes within a five-year study period.

The Study aims to support the related interventions identified in the South African Road Safety Strategy (NRSS 2016-2030) and provides output to be included.

This report further provides baseline analysis for further research as well as recommendations for further research and analysis that would provide input towards reducing death and serious injury due to road crashes.

1.1. Background

In line with the National Road Safety Strategy (NRSS) 2016-2030, research into situational conditions of crashes (time of day, weather, other vehicles present/involved) need to be conducted which should feed into road safety guidelines and provide intelligence to plan and action the reduction of fatal truck and bus crashes.

Statistics on the type of vehicles involved in fatal crashes the number of fatal crashes fatalities are analysed and presented in the RTMC annual State of Road Safety Report (SORSR). More comprehensive analysis on specifically trucks and buses involved in fatal crashes is needed to provide tailor-made interventions to reduce fatalities and serious injury due to such crashes.

With various truck and bus crashes reported over the past few years where lives are lost due to amongst others human error such as speeding, fatigue and unsafe overtaking, there is a need to analyse and provide information and trends on where such fatal crashes occur, when they occur, the type of crashes and to identify and understand in which areas the owners of the trucks and buses involved in fatal crashes reside to, for the Road Traffic Management Corporation (RTMC) to intervene if needed.

The study outcomes will provide input to road safety practitioners and traffic law enforcement towards planning and interventions to reduce death and serious injury due to truck and bus crashes.

1.2. Research Scope

To establish where fatal truck and bus crashes occur in South Africa, when such crashes occur and the type of such crashes. Furthermore, to identify hot spots where most such fatal crashes occur in the form of hazardous road segments and to identify in which months fatal truck and bus crashes occur, the day of the week down to the time of day as well as data on owners of trucks and buses involved in most fatal crashes.

To recommend further research/analysis identified during this study.

1.3. Analysis Methodology

Comparative analysis is conducted on variables relating to fatal truck and bus crashes with trucks and buses defined as follows, in line with National Traffic Information System (NaTIS) vehicle type definitions:

- Truck = Truck Articulated and Truck Articulated-Multiple
- Bus = Bus and Bus-Train
- Other = All other vehicle types

The analysis period (study period) for trucks and buses involved in fatal crashes is between 1 January 2018 and 31 December 2022, a period of 5 years, 60 months, or 1,826 days.

Fatalities were intentionally not included in the detailed analysis for truck and buses to focus on the actual fatal crashes and not to include outliers where the crash severity is higher than the averages.

1.4. Link to NRSS (2016-2030) Interventions

This study is in line with the following NRSS interventions:

- 1A(ii) Continue to support improvement measures to address the problem areas within road safety.
- 1D(iv) Strengthen programme to share data across the private and public sector.
- 1D(iii) Commission research into situational conditions of crashes (time of day, weather, other vehicles present/involved), which should feed into road safety guidelines.
- 4C(vi) Identify and address of high-risk road users for focused interventions.

2 DATA USED IN ANALYSIS

2.1.1. Data used in Analysis:

The following two data sets were used for the analysis:

- RTMC fatal crash data - 1 January 2018 to 31 December 2022
- NaTIS total self-propelled vehicle population (Trucks and Buses)

A total of 4 001 trucks and buses were involved in fatal crashes during the study period in 2 560 fatal crashes with 3 413 fatalities recorded with a combined crash severity of 1.33 (average fatalities per crash). 3 340 or 82.1% of the recorded vehicle registrations were traced to NaTIS and categorised per 'owner province'.

2.1.2. Fatal Crash Data Used:

Fatal crash data recorded on the RTMC National Crash Data Management System (NCDMS) was used for trucks and buses involved in fatal crashes between 1 January 2018 and 31 December 2022, a period of 5 years, 60 months, or 1,826 days.

2.1.3. RTMC Fatal Crash Data Limitations:

A Total of 82.1% or 3 340 of the 4 001 trucks and buses involved in the fatal crashes over the study period could be linked to NaTIS through the reported and recorded vehicle license numbers plate. The 17.9% of the data that could not be linked to a specific type of vehicle on the NaTIS are due to inter alia:

- No vehicle number plates available for hit & run type crashes
- Foreign vehicles not included
- Erroneous reporting/recording of vehicle number plates

2.2. NaTIS Vehicle Population Data

2.2.1. NaTIS Vehicle Population Data Used:

NaTIS total self-propelled vehicle population for Trucks and Buses (current) were used for comparative analysis in the study. The difference in the percentage self-propelled vehicles for current and year-on-year from 2018 to 2022 for NaTIS vehicle types is very small and neglectable for the purposes of this study.

Table 1 below provides the NaTIS total self-propelled vehicle population for Trucks and Buses that was used in the comparative analysis.

Table 1 NaTIS Vehicle Population Data Used

Prov	Trucks	Buses	Other	Total	% Trucks	% Buses	% Other	% Of Total
EC	18 937	4 294	681 555	704 786	5,8%	7,7%	6,5%	6,5%
FS	21 143	3 070	523 446	547 659	6,5%	5,5%	5,0%	5,0%
GP	116 817	16 541	3 960 672	4 094 030	35,8%	29,5%	37,8%	37,7%
KZN	44 639	7 289	1 414 114	1 466 042	13,7%	13,0%	13,5%	13,5%
LIM	23 395	6 269	619 757	649 421	7,2%	11,2%	5,9%	6,0%
MP	36 184	7 067	726 510	769 761	11,1%	12,6%	6,9%	7,1%
NC	8 101	1 722	238 846	248 669	2,5%	3,1%	2,3%	2,3%
NW	15 409	3 542	535 347	554 298	4,7%	6,3%	5,1%	5,1%
WC	41 759	6 272	1 780 548	1 828 579	12,8%	11,2%	17,0%	16,8%
Total	326 384	56 066	10 480 795	10 863 245	100%	100%	100%	100%
% Of Total	3,0%	0,5%	96,5%	100,0%				

3 ANALYSIS

A detailed analysis was conducted to establish trends where and when trucks and buses were involved in fatal crashes over a five-year period from 2018 to 2022.

Data extracted from the RTMC NaTIS and NCDMS Systems were used to identify the following for each of the recorded 4 001 fatal truck and bus crashes:

- Crash road/street location per SAPS Area linked to province
- Crash Year, Month, Day of the Week
- Crash time
- Fatalities in fatal crashes
- Vehicle type/s
- Vehicle description/s
- Vehicle registration number/s
- Owner of vehicle/s at the time of the fatal crash and in which province an owner/business resides
- Self-propelled vehicle population per class of vehicle

In line with the stipulations of the Protection of Personal Information Act (POPIA), 2013, the identity and exact location of the owners of the vehicles that were involved in the fatal crashes are not reported on, only the province in which the owner/business resides are provided to provide context in which provinces such owners reside.

For the purposes of this report, owners are identified as T1-T25 and B1-B25 for the top 25 owners with most trucks (T) and buses (B) involved in fatal crashes, respectively.

The RTMC will plan and action applicable investigation to collectively discuss and address possible road safety related challenges with owners whose trucks or buses contribute most to related fatal crashes.

3.1. All Fatal Crashes 2018 - 2022

South Africa is known for its high level of road fatalities, which continues to hamper socio-economic development and impact the well-being of all South Africans. Road traffic and fatal crash information are reported on a national level, for country reporting purposes, to the World Health Organisation (WHO), as well as to record and analyse annually on the whole spectrum of data collected for road safety interventions[1].

In 2018 the World Health Organisation ranked South Africa at number 136 of 175 of participating countries regarding road safety. This ranking infers that South Africa falls within 30% of the poorest performing countries in terms of the relative risk associated with dying, due to a road traffic crash.

Statistics on the number of vehicles involved in fatal crashes, the type of vehicles involved in fatal crashes and fatalities are included in the RTMC annual State of Road Safety Report (SORSR). More in-depth analysis on trucks and buses involved in fatal crashes is needed to provide tailor-made interventions to reduce fatalities and serious injury due to such crashes.

To provide the context for further analysis on fatal truck and bus crashes, all crashes in South Africa during the study period was established. Table 2 provides an indication of all fatal crashes over the five-year study period.

The number of vehicles involved in fatal crashes, the number of fatal crashes and the number of fatalities recorded in fatal crashes per province follow the same trend in that the three parameters are mostly in line with one another per province.

Figures 1 and 2 below provide a visual illustration of the % of vehicles involved in-, fatal crashes, and fatalities for all vehicle types over the study period.

[1] M Vanderschuren and D Roux, Road Safety Comparison in South Africa – How Do the Different Provinces Compare? - 2019

Table 2 No. of vehicles involved in-, fatal crashes, and fatalities (all vehicle types)

Prov	Vehicles involved	% Veh involved	Fatal crashes	% Fatal crashes	Fatalities	% Fatalities	Crash severity	Ave vehicles per crash
EC	7 751	11,9%	6 256	12,4%	7 627	12,6%	1,2	1,2
FS	4 055	6,2%	3 030	6,0%	3 993	6,6%	1,3	1,3
GP	14 193	21,9%	10 788	21,3%	12 056	19,9%	1,1	1,3
KZN	12 266	18,9%	10 068	19,9%	11 637	19,2%	1,2	1,2
LP	7 276	11,2%	5 458	10,8%	7 013	11,6%	1,3	1,3
MP	6 897	10,6%	5 006	9,9%	6 281	10,4%	1,3	1,4
NC	1 792	2,8%	1 465	2,9%	1 819	3,0%	1,2	1,2
NW	4 530	7,0%	3 455	6,8%	4 293	7,1%	1,2	1,3
WC	6 192	9,5%	5 106	10,1%	5 937	9,8%	1,2	1,2
Total	64 952		50 632		60 656		1,2	1,3

Figure 1 % vehicles involved in fatal crashes, fatal crashes and fatalities (all vehicle types)

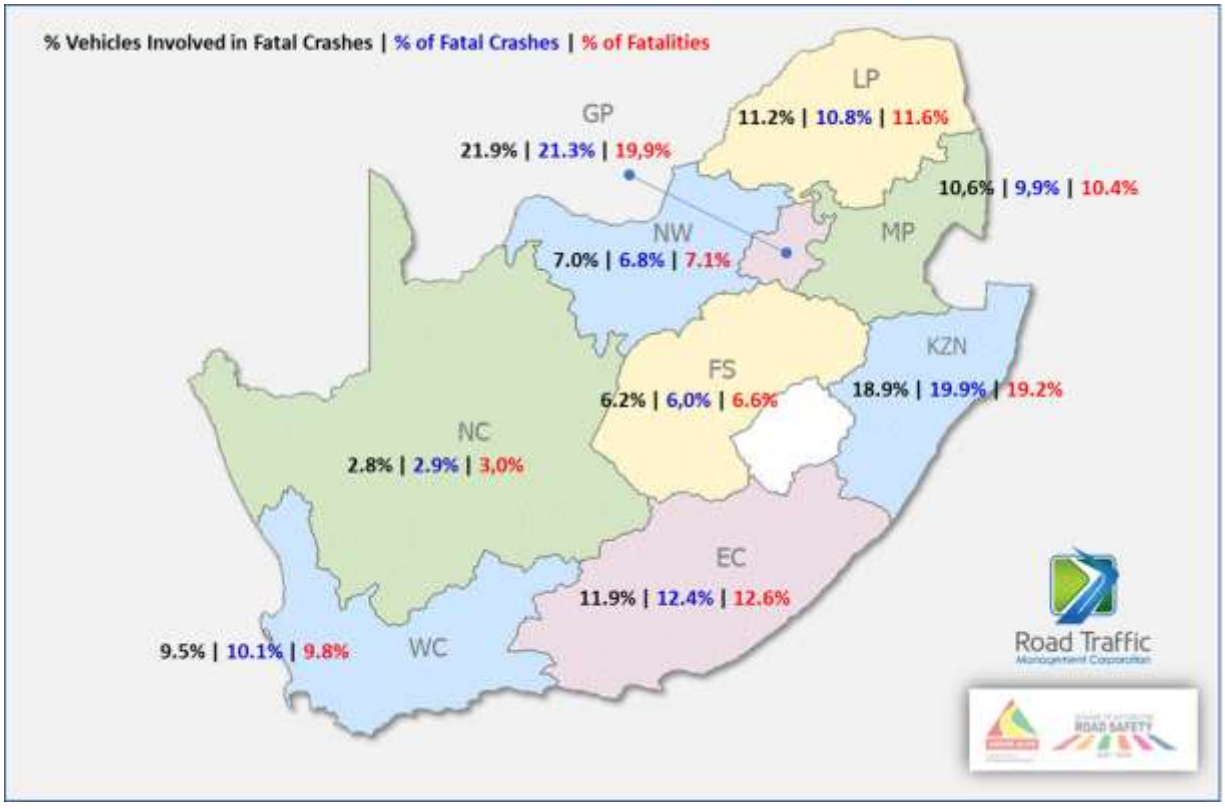
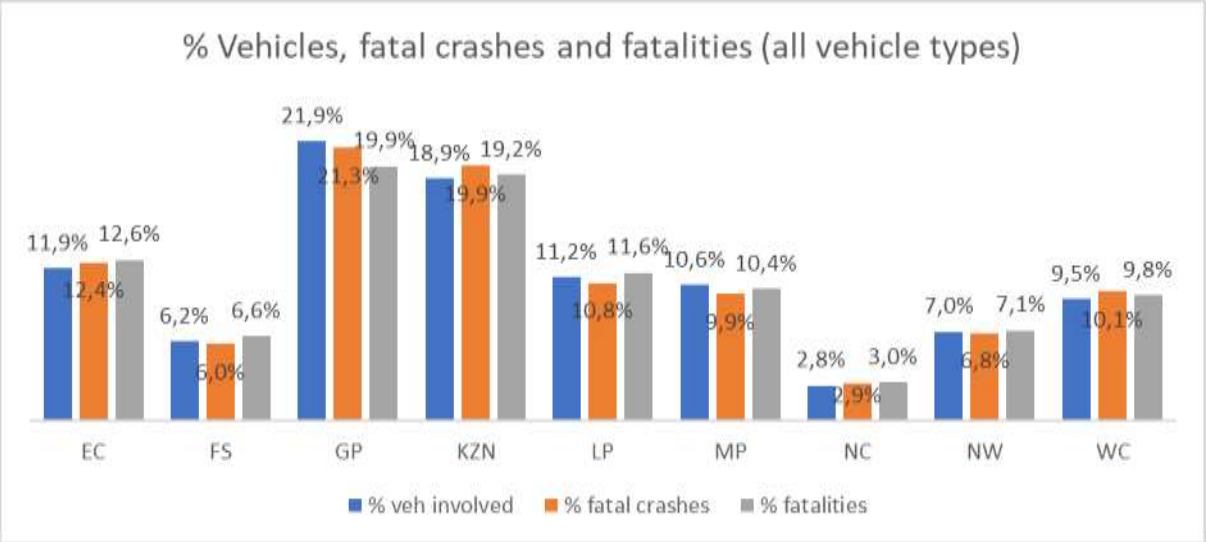
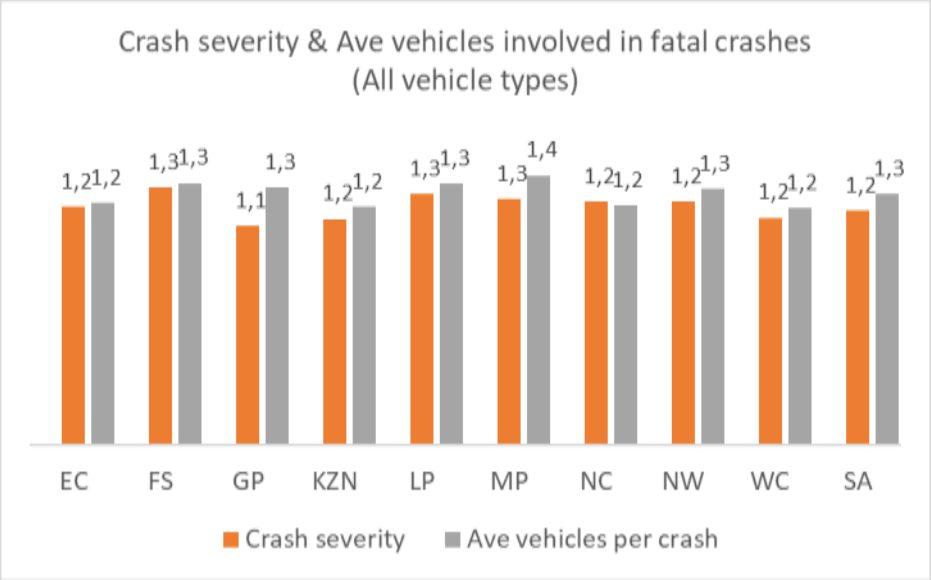


Figure 2 % vehicles involved in -, % fatal crashes and % fatalities (all vehicle types)



The average crash severity (number of fatalities per crash) for all types of fatal crashes is 1.2 and five of the provinces are in line with this average except for the Free State, Limpopo, and Mpumalanga provinces where more fatalities are recorded per crash i.e., 1.3 persons killed per crash and the Gauteng province with a lower crash severity of 1.1, and the Mpumalanga province with the highest crash severity of 1.4, illustrated in Figure 3 below.

Figure 3 Crash severity and average of all vehicles involved in fatal crashes



Towards providing context to the number of registered self-propelled vehicles per province relative to the number of vehicles involved in fatal crashes recorded, the relevant NaTIS registered self-propelled vehicle population were used to determine the % total registered self-propelled vehicles per province.

The Gauteng and Western Cape provinces have less vehicles involved in fatal crashes than vehicles registered in the respective provinces.

The remaining seven provinces have more vehicles involved in fatal crashes than their respective number of registered vehicles. Tables 3 and 4 below and figures 4 and 5 below quantifies/illustrates the latter.

Table 3 Number of and % registered vehicles on NaTIS per type

Prov	Trucks	Buses	Other	Total	% Trucks	% Buses	% Other	% Of Total
EC	18 937	4 294	681 555	704 786	5,8%	7,7%	6,5%	6,5%
FS	21 143	3 070	523 446	547 659	6,5%	5,5%	5,0%	5,0%
GP	116 817	16 541	3 960 672	4 094 030	35,8%	29,5%	37,8%	37,7%
KZN	44 639	7 289	1 414 114	1 466 042	13,7%	13,0%	13,5%	13,5%
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MP	36 184	7 067	726 510	769 761	11,1%	12,6%	6,9%	7,1%
NC	8 101	1 722	238 846	248 669	2,5%	3,1%	2,3%	2,3%
NW	15 409	3 542	535 347	554 298	4,7%	6,3%	5,1%	5,1%
WC	41 759	6 272	1 780 548	1 828 579	12,8%	11,2%	17,0%	16,8%
Total	326 384	56 066	10 480 795	10 863 245	100%	100%	100%	100%
% Of Total	3,0%	0,5%	96,5%	100,0%				

Table 4 % All vehicles in fatal crashes vs registered self-propelled vehicles

Prov	% Total vehicles involved in fatal crashes	% Total registered self-propelled vehicles	% Points over/under represented
EC	11,9%	6,5%	5,4%
FS	6,2%	5,0%	1,2%
GP	21,9%	37,7%	-15,8%
KZN	18,9%	13,5%	5,4%
LP	11,2%	6,0%	5,2%
MP	10,6%	7,1%	3,5%
NC	2,8%	2,3%	0,5%
NW	7,0%	5,1%	1,9%
WC	9,5%	16,8%	-7,3%

Figure 4 % All vehicles in fatal crashes vs registered self-propelled vehicles

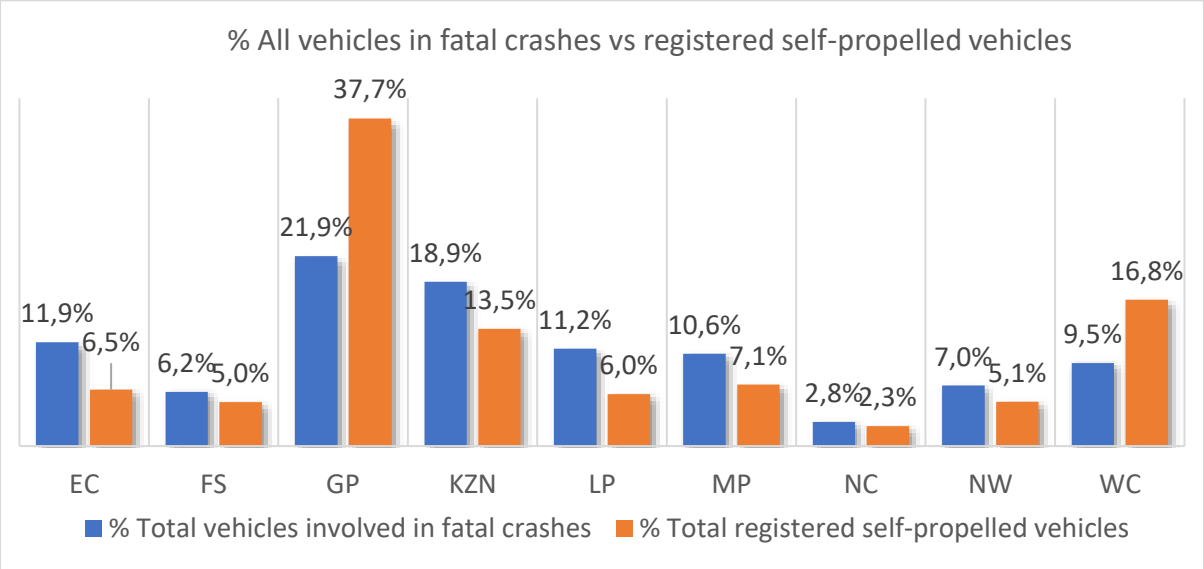
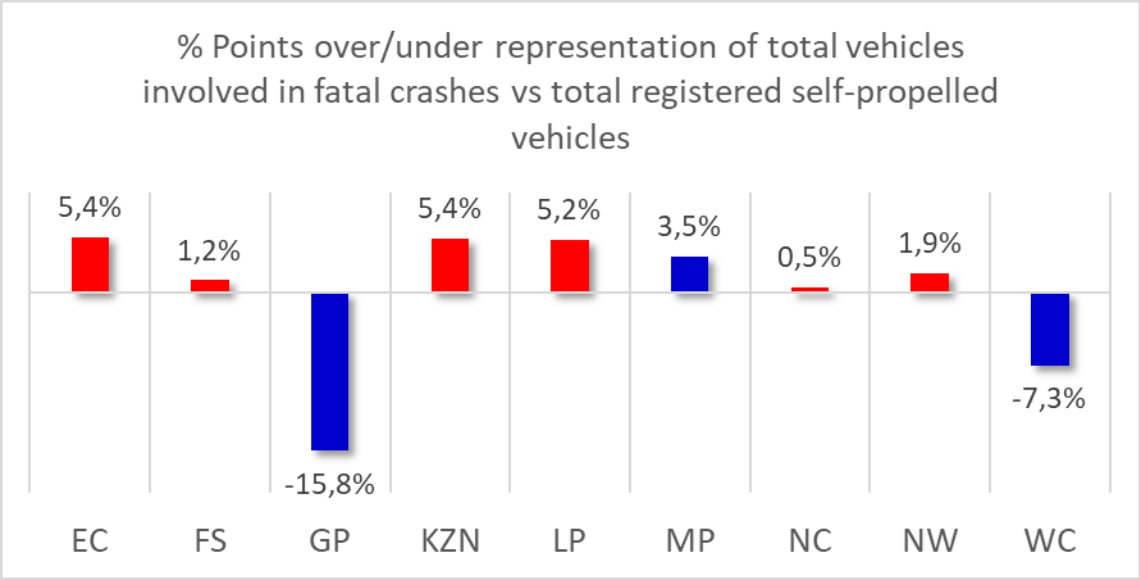


Figure 5 Over/under representation of vehicles in fatal crashes



3.2. Trucks and Buses in Fatal Crashes

As indicated in section 3.1 above, in-depth analysis on trucks and buses involved in fatal crashes is needed to provide tailor-made interventions to reduce fatalities and serious injury due to such crashes.

Similar to section 3.1 above, the number of trucks and buses involved in fatal crashes, the number of fatal crashes where trucks and buses were involved, and the number of fatalities recorded in such fatal crashes per province are analysed and reported on below.

A total of 4 001 trucks and buses were involved in 2 560 fatal crashes with 3 413 fatalities recorded in such crashes. The Kwazulu-Natal province recorded the highest number of fatal crashes i.e., with 21.6% or 552 where trucks and buses were involved. The lowest number of truck and bus related fatal crashes were recorded in the Northern Cape province with only 2.5% or 65 such crashes.

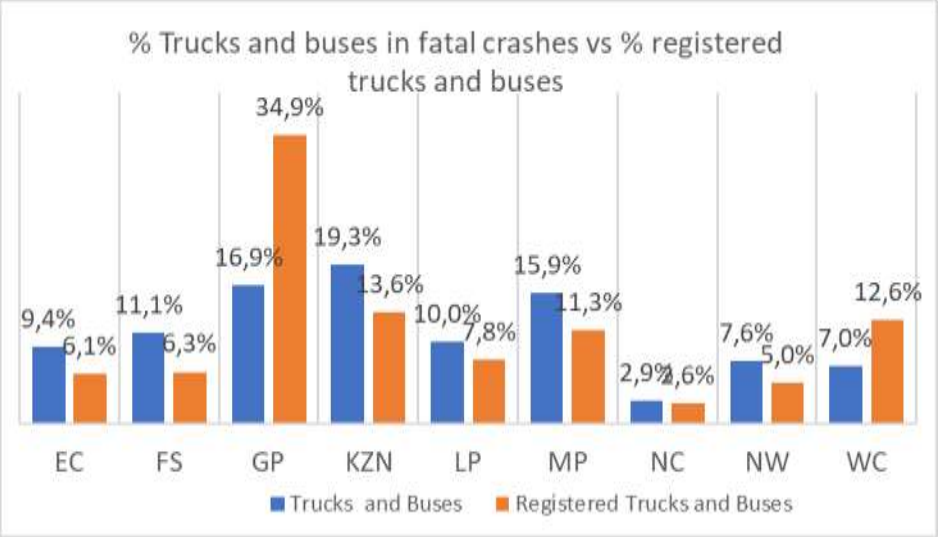
Table 5 below provides an indication of fatal crashes where trucks and buses were involved over the five-year study period.

Table 5 Trucks and Buses involved in fatal crashes

Prov	Vehicles involved	% Veh involved	Fatal crashes	% Fatal crashes	Fatalities	% Fatalities	Crash severity	Ave vehicles per crash
EC	415	10,4%	271	10,6%	373	10,9%	1,4	1,5
FS	416	10,4%	237	9,3%	346	10,1%	1,5	1,8
GP	675	16,9%	418	16,3%	499	14,6%	1,2	1,6
KZN	758	18,9%	552	21,6%	741	21,7%	1,3	1,4
LP	403	10,1%	260	10,2%	406	11,9%	1,6	1,6
MP	632	15,8%	378	14,8%	490	14,4%	1,3	1,7
NC	121	3,0%	65	2,5%	95	2,8%	1,5	1,9
NW	303	7,6%	180	7,0%	223	6,5%	1,2	1,7
WC	278	6,9%	199	7,8%	240	7,0%	1,2	1,4
Total	4 001		2 560		3 413		1,3	1,6

Figure 6 below provide a visual illustration of the % trucks and buses involved in fatal crashes, number of fatal crashes- and fatalities for crashes where trucks and buses were involved over the study period.

Figure 6 % vehicles involved in fatal crashes, fatal crashes and fatalities (trucks & buses)

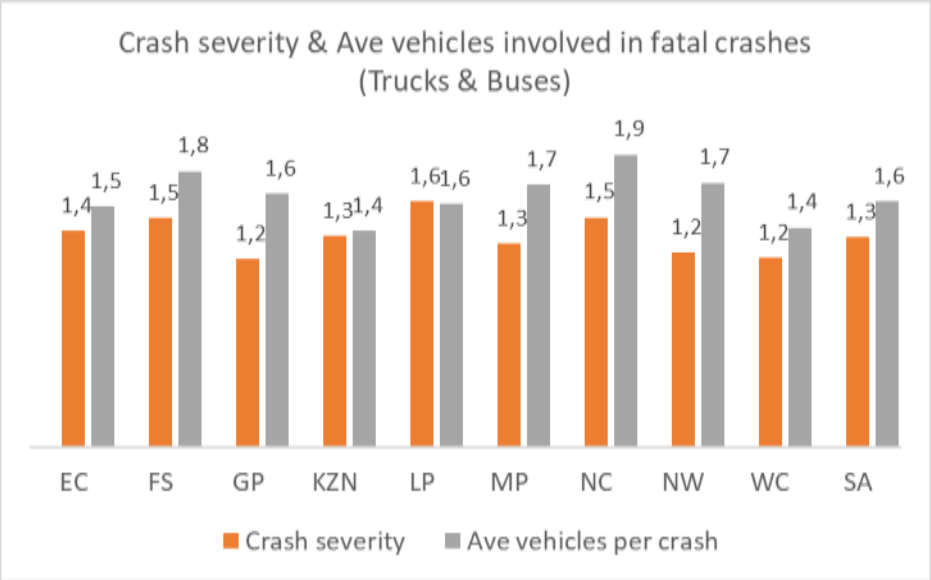


The average crash severity (number of fatalities per crash) for crashes where trucks and buses were involved in South Africa is much higher than for fatal crashes where all vehicles were involved i.e., 1.2. For truck and bus crashes, the crash severity range from 1.2 in the Gauteng, Nort West and Western Cape provinces to 1.5 in the Northern Cape and 1.7 in the Mpumalanga provinces.

The high crash severity in the Northern Cape and Limpopo provinces is due to a number of high fatal truck/bus crashes where a high number of lives were lost in these provinces over the study period.

The average trucks and buses involved in fatal crashes follows the same trend per province crash with the Limpopo and Northern Cape provinces having more fatalities in truck and bus crashes relative to the respective number of fatal crashes in the provinces (Figure 7 below).

Figure 7 Crash severity and average buses and trucks involved in fatal crashes



The registered number of trucks and buses per province relative to the number of trucks and buses involved in fatal crashes recorded are depicted in Table 6 below.

Similar as for all types of vehicles in 3.1 above, the Gauteng and Western Cape provinces have less vehicles involved in fatal crashes than vehicles registered in the respective provinces.

The remaining seven provinces have more vehicles involved in fatal crashes than their respective number of registered vehicles. Table 6 and 7 and figures 6 and 7 below quantifies/illustrates the latter.

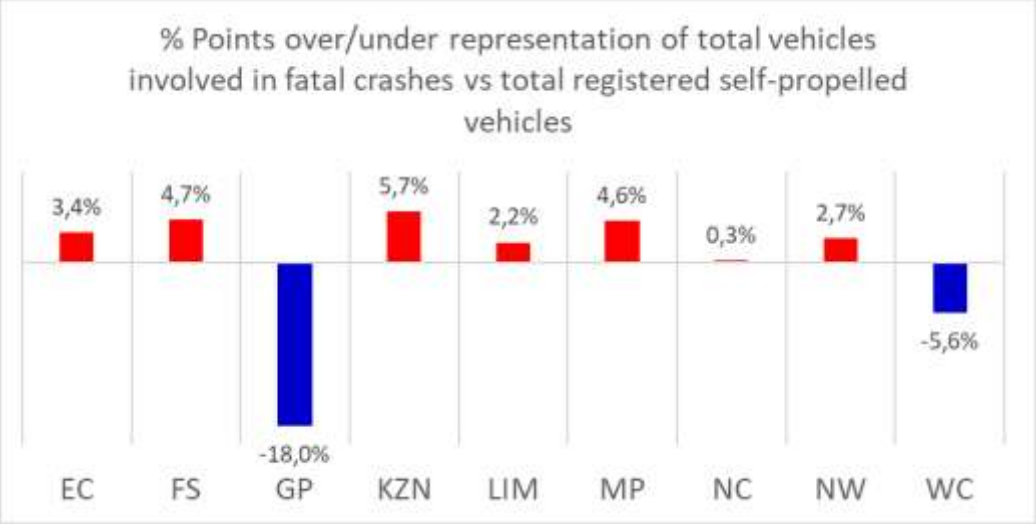
Table 6 Number of and % registered trucks and buses on NaTIS

Prov	Trucks + Buses	% of Total
EC	23 231	6,1%
FS	24 213	6,3%
GP	133 358	34,9%
KZN	51 928	13,6%
LIM	29 664	7,8%
MP	43 251	11,3%
NC	9 823	2,6%
NW	18 951	5,0%
WC	48 031	12,6%
Total	382 450	
% Of Total	3,5%	

Table 7 % All vehicles in fatal crashes vs registered self-propelled vehicles

Prov	Trucks and Buses	Registered Trucks and Buses	% Points over/under represented
EC	9,4%	6,1%	3,4%
FS	11,1%	6,3%	4,7%
GP	16,9%	34,9%	-18,0%
KZN	19,3%	13,6%	5,7%
LP	10,0%	7,8%	2,2%
MP	15,9%	11,3%	4,6%
NC	2,9%	2,6%	0,3%
NW	7,6%	5,0%	2,7%
WC	7,0%	12,6%	-5,6%

Figure 8 Over/under representation of trucks and buses in fatal crashes



3.3. Trucks in Fatal Crashes

The number of trucks involved in fatal crashes, the number of fatal crashes where trucks were involved, and the number of fatalities recorded in fatal crashes where trucks were involved per province were analysed and are reported on below.

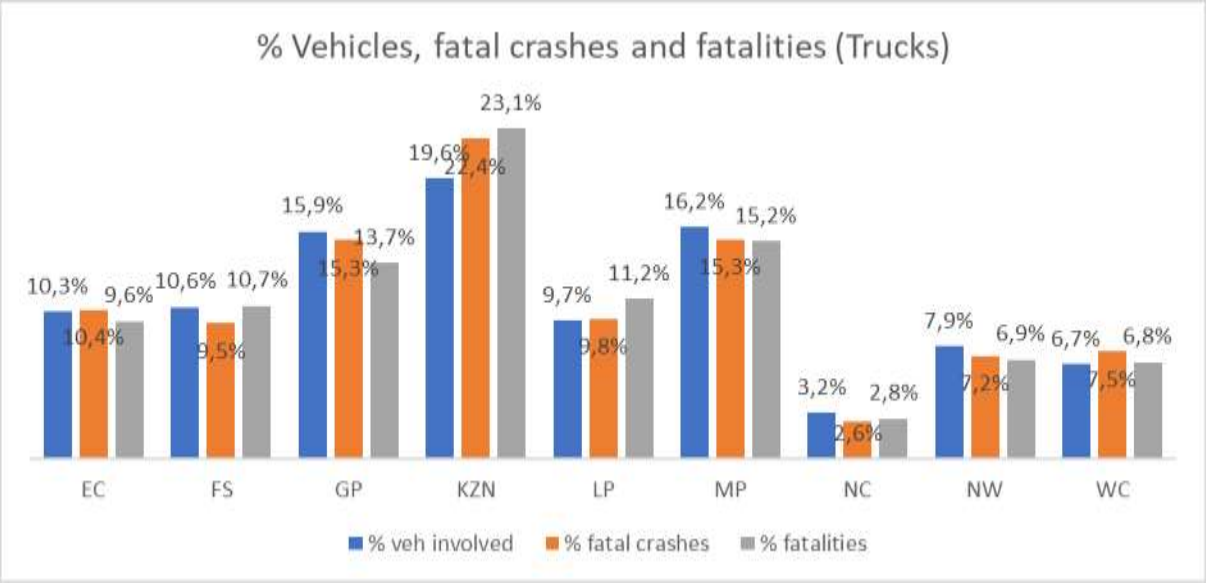
A total of 3 546 trucks were involved in 2 237 fatal crashes with 2 926 fatalities recorded in such crashes with an average crash severity of 1.33. The Kwazulu-Natal province recorded the highest number of fatal crashes where trucks were involved with 22.4% or 500 such crashes. The lowest number of fatal crashes where trucks were involved were recorded in the Northern Cape province with only 2.5% or 59 such fatal crashes.

Table 8 below provides an indication of fatal crashes where trucks were involved over the five-year study period.

Table 8 Number of and % trucks involved in fatal crashes, fatal crashes and fatalities

Prov	Vehicles involved	% Veh involved	Fatal crashes	% Fatal crashes	Fatalities	% Fatalities	Crash severity	Ave vehicles per crash
EC	365	10,3%	233	10,4%	282	9,6%	1,2	1,6
FS	376	10,6%	212	9,5%	313	10,7%	1,5	1,8
GP	563	15,9%	342	15,3%	400	13,7%	1,2	1,6
KZN	694	19,6%	500	22,4%	675	23,1%	1,4	1,4
LP	344	9,7%	219	9,8%	327	11,2%	1,5	1,6
MP	575	16,2%	343	15,3%	445	15,2%	1,3	1,7
NC	114	3,2%	59	2,6%	83	2,8%	1,4	1,9
NW	279	7,9%	161	7,2%	203	6,9%	1,3	1,7
WC	236	6,7%	168	7,5%	198	6,8%	1,2	1,4
Total	3 546		2 237		2 926		1,3	1,6

Figure 9 % Trucks involved in fatal crashes, fatal crashes and fatalities

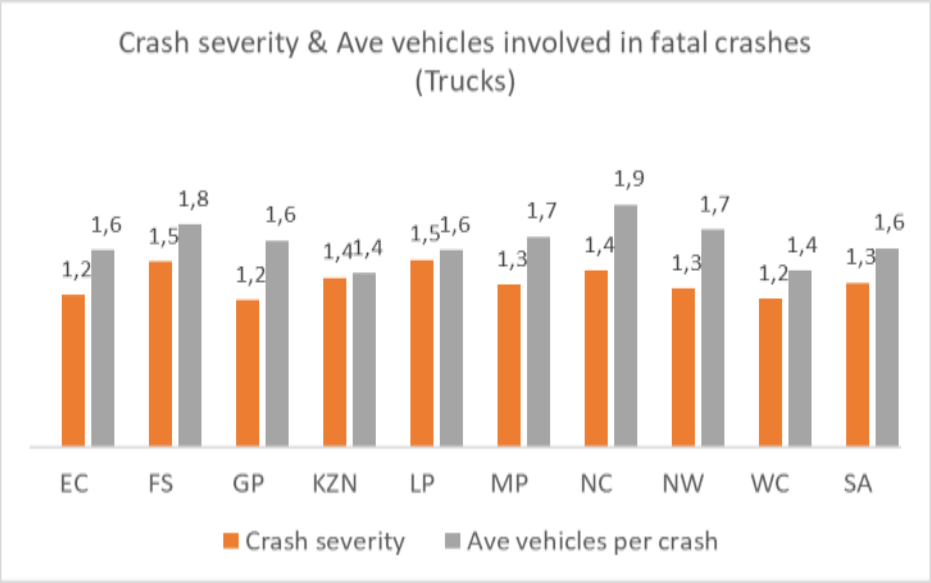


The average crash severity (number of fatalities per crash) for crashes where trucks were involved in South Africa over the study period is higher than for fatal crashes where all vehicles were involved i.e., 1.2. For truck fatal crashes, the crash severity range from 1.2 in the Gauteng, Eastern Cape and Western Cape provinces to 1.8 in the Free State province.

The high crash severity in Free State is due to a number of high fatality truck crashes that occurred in the provinces over the study period on the N3, especially in the Harrismith area.

The average trucks involved in fatal crashes follows the same trend per province with the North West and Northern Cape provinces having more trucks involved in fatal crashes relative to the respective number of fatal crashes in the provinces (Figure 10 below).

Figure 10 Crash severity and average trucks involved in fatal crashes



3.4. Buses in Fatal Crashes

The number of buses involved in fatal crashes, the number of fatal crashes where buses were involved, and the number of fatalities recorded in fatal crashes where buses were involved per province were analysed and reported on below.

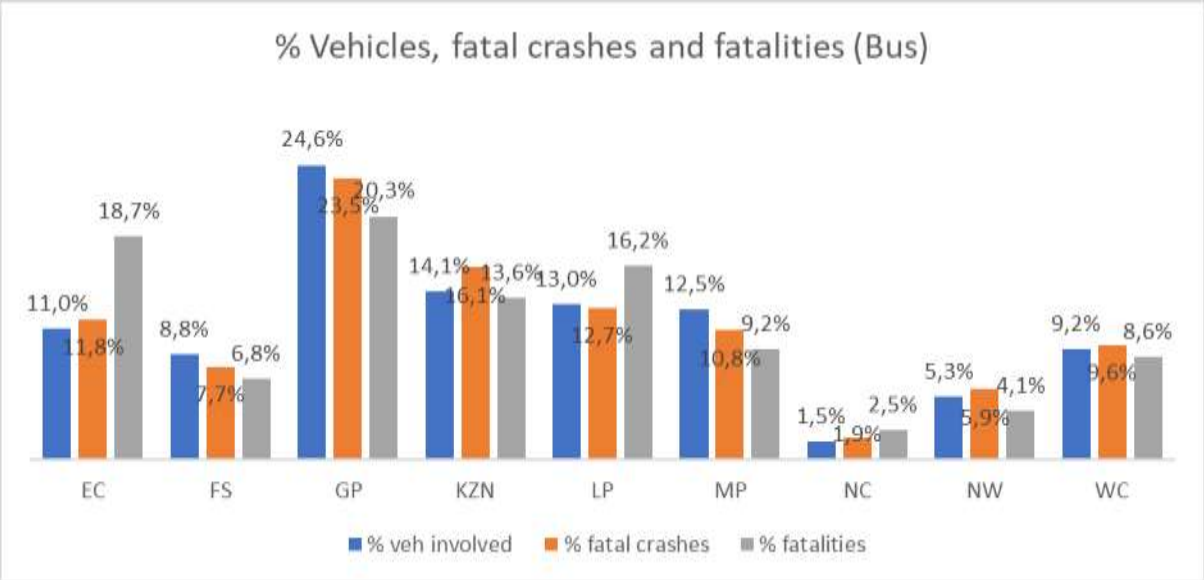
A total of 455 buses were involved in 323 fatal crashes with 487 fatalities recorded in such crashes. The Gauteng province recorded the highest number of fatal crashes where buses were involved with 23.5% or 76 fatal crashes where buses were involved. The lowest number of 'bus' fatal crashes were recorded in the Northern Cape province with 1.9% or 6 such fatal crashes.

Table 9 and figure 11 below provides an indication of fatal crashes where buses were involved over the five-year study period.

Table 9 Number of and % Buses involved in fatal crashes, fatal crashes and fatalities

Prov	Vehicles involved	% Veh involved	Fatal crashes	% Fatal crashes	Fatalities	% Fatalities	Crash severity	Ave vehicles per crash
EC	50	11,0%	38	11,8%	91	18,7%	2,4	1,3
FS	40	8,8%	25	7,7%	33	6,8%	1,3	1,6
GP	112	24,6%	76	23,5%	99	20,3%	1,3	1,5
KZN	64	14,1%	52	16,1%	66	13,6%	1,3	1,2
LP	59	13,0%	41	12,7%	79	16,2%	1,9	1,4
MP	57	12,5%	35	10,8%	45	9,2%	1,3	1,6
NC	7	1,5%	6	1,9%	12	2,5%	2,0	1,2
NW	24	5,3%	19	5,9%	20	4,1%	1,1	1,3
WC	42	9,2%	31	9,6%	42	8,6%	1,4	1,4
Total	455		323		487		1,5	1,4

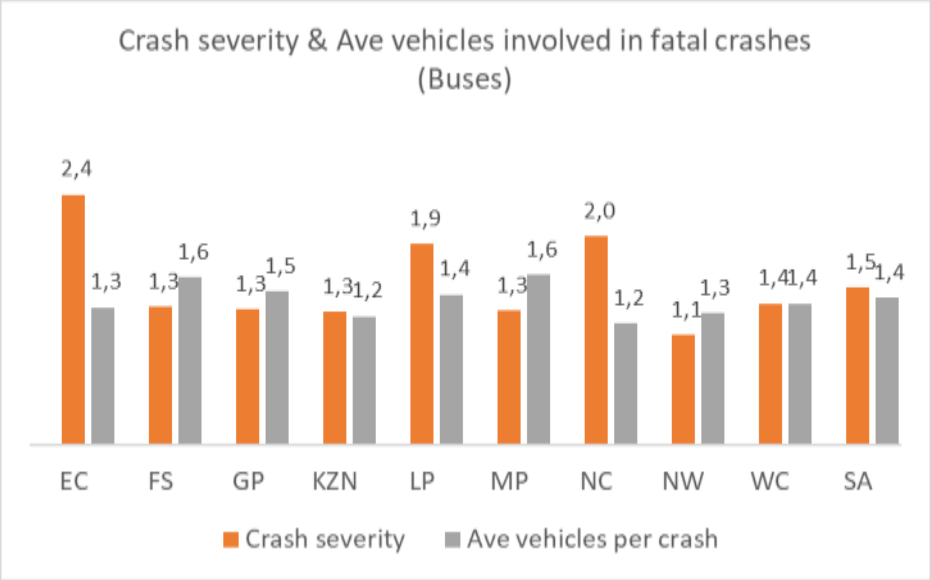
Figure 11 % Buses, fatal crashes where buses were involved and fatalities



The average crash severity (number of fatalities per crash) for crashes where buses were involved in South Africa over the study period is also higher than for fatal crashes where all vehicles were involved (all vehicles = 1.2). For bus fatal crashes, the crash severity range from 1.1 in the North West province to 2.4 in the Eastern Cape province.

The high crash severity in the Eastern Cape, Limpopo and Northern Cape provinces is due to major bus crashes where many people lost their lives.

Figure 12 Crash severity and average vehicles involved in crashes (buses)



3.5. Trucks and Buses in Fatal Crashes per Day and Time

Truck crashes were further analysed to indicate the day of the week and the time of the day during when most truck crashes occur. The most crashes where trucks were involved over the study period are between 18:00 and 22:00 on Saturdays with 187 reported crashes where trucks were involved or 5.3% of such crashes. Second highest, between 18:00 and 22:00 on Sundays with 176 or 5.0% of crashes where trucks were involved.

The most fatal crashes where trucks were involved occurred on during the four-hour period between 18:00 and 22:00 on Saturdays and Sundays with a combined total of 363 or 10.2% such fatal crashes.

Less fatal crashes where trucks were involved occur from Mondays to Fridays with the exeption of Fridays between 18:00 and 21:00 with 159 or 4.5% of truck related crashes.

Most fatal crashes where trucks were involved in occurred on Saturdays and Sundays with 770 or 21.7 % and 667 or 18.8% of all such crashes, combined, fatal truck relates crashes on Saturdays and Sundays constitutes 1 437 or 40.5% of fatal truck related crashes.

Even though truck related fatal crashes occur during all time bins and during all weekdays, the Day & Time analysis provides a clear picture of when truck related fatal crashes occur.

The above is depicted in Table 10 below.

Table 10 Trucks involved in fatal crashes per Day & Time

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-01:00	19	18	11	10	11	13	18	100
01:00-02:00	19	12	7	12	11	20	19	100
02:00-03:00	17	8	2	3	5	11	19	65
03:00-04:00	10	9	10	8	7	12	27	83
04:00-05:00	35	12	15	8	21	15	32	138
05:00-06:00	27	26	16	19	11	28	28	155
06:00-07:00	36	14	30	9	15	13	42	159
07:00-08:00	21	22	18	14	20	18	24	137
08:00-09:00	14	14	18	13	14	17	32	122
09:00-10:00	20	10	25	16	15	13	24	123
10:00-11:00	20	14	24	12	17	21	29	137
11:00-12:00	27	18	17	23	13	23	30	151
12:00-13:00	23	12	10	13	11	24	29	122
13:00-14:00	26	27	12	25	7	28	28	153
14:00-15:00	31	15	17	15	17	23	28	146
15:00-16:00	34	19	19	17	17	32	35	173
16:00-17:00	29	17	18	16	14	21	35	150
17:00-18:00	34	20	21	16	13	22	31	157
18:00-19:00	45	25	17	21	24	31	41	204
19:00-20:00	46	32	24	19	32	41	55	249
20:00-21:00	41	21	22	22	27	51	51	235
21:00-22:00	44	20	25	21	21	36	40	207
22:00-23:00	26	18	17	16	11	23	36	147
23:00-24:00	23	12	10	10	15	26	37	133
Total	667	415	405	358	369	562	770	3 546

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-01:00	0,5%	0,5%	0,3%	0,3%	0,3%	0,4%	0,5%	2,8%
01:00-02:00	0,5%	0,3%	0,2%	0,3%	0,3%	0,6%	0,5%	2,8%
02:00-03:00	0,5%	0,2%	0,1%	0,1%	0,1%	0,3%	0,5%	1,8%
03:00-04:00	0,3%	0,3%	0,3%	0,2%	0,2%	0,3%	0,8%	2,3%
04:00-05:00	1,0%	0,3%	0,4%	0,2%	0,6%	0,4%	0,9%	3,9%
05:00-06:00	0,8%	0,7%	0,5%	0,5%	0,3%	0,8%	0,8%	4,4%
06:00-07:00	1,0%	0,4%	0,8%	0,3%	0,4%	0,4%	1,2%	4,5%
07:00-08:00	0,6%	0,6%	0,5%	0,4%	0,6%	0,5%	0,7%	3,9%
08:00-09:00	0,4%	0,4%	0,5%	0,4%	0,4%	0,5%	0,9%	3,4%
09:00-10:00	0,6%	0,3%	0,7%	0,5%	0,4%	0,4%	0,7%	3,5%
10:00-11:00	0,6%	0,4%	0,7%	0,3%	0,5%	0,6%	0,8%	3,9%
11:00-12:00	0,8%	0,5%	0,5%	0,6%	0,4%	0,6%	0,8%	4,3%
12:00-13:00	0,6%	0,3%	0,3%	0,4%	0,3%	0,7%	0,8%	3,4%
13:00-14:00	0,7%	0,8%	0,3%	0,7%	0,2%	0,8%	0,8%	4,3%
14:00-15:00	0,9%	0,4%	0,5%	0,4%	0,5%	0,6%	0,8%	4,1%
15:00-16:00	1,0%	0,5%	0,5%	0,5%	0,5%	0,9%	1,0%	4,9%
16:00-17:00	0,8%	0,5%	0,5%	0,5%	0,4%	0,6%	1,0%	4,2%
17:00-18:00	1,0%	0,6%	0,6%	0,5%	0,4%	0,6%	0,9%	4,4%
18:00-19:00	1,3%	0,7%	0,5%	0,6%	0,7%	0,9%	1,2%	5,8%
19:00-20:00	1,3%	0,9%	0,7%	0,5%	0,9%	1,2%	1,6%	7,0%
20:00-21:00	1,2%	0,6%	0,6%	0,6%	0,8%	1,4%	1,4%	6,6%
21:00-22:00	1,2%	0,6%	0,7%	0,6%	0,6%	1,0%	1,1%	5,8%
22:00-23:00	0,7%	0,5%	0,5%	0,5%	0,3%	0,6%	1,0%	4,1%
23:00-24:00	0,6%	0,3%	0,3%	0,3%	0,4%	0,7%	1,0%	3,8%
Total	18,8%	11,7%	11,4%	10,1%	10,4%	15,8%	21,7%	100,0%

Further analysis of buses involved in fatal crashes was conducted to indicate the day of the week and the time of the day during when most bus crashes occur. The most fatal crashes where buses were involved in over the study period are between 05:00 and 08:00 on Sundays with 36 or or 7.0% of such crashes recorded. The second highest time period where buses were involved in fatal crashes were between 05:00 and 08:00 on Saturdays with 25 or or 5.5% of such crashes.

Less fatal crashes where buses were involved occur from Mondays to Fridays with the exeption of Fridays between 05:00 and 08:00 on Fridays with 20 or 4.4% of bus related crashes.

Most fatal crashes where buses were involved in occurred on Saturdays and Sundays with a combined total of 57 or 12.5% of fatal bus related crashes. The time period between 05:00 and 05:00 has the highest recorded fatal bus related crashed with 126 or 27.7% such fatal crashes

Even though bus related fatal crashes occur during all time bins and during all weekdays, the Day & Time analysis provides a clear picture of when bus related fatal crashes occur.

The above is depicted in Table 11 below.

Table 11 Buses involved in fatal crashes per Day & Time

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-01:00	4	1		2		3	2	12
01:00-02:00			1		1	3	3	8
02:00-03:00		1	2	2	1	2	1	9
03:00-04:00	2		1		2	2	6	13
04:00-05:00	4	2	2	1	1		2	12
05:00-06:00	11	3	3		3	8	10	38
06:00-07:00	8	5	4	7	4	3	9	40
07:00-08:00	13	7	6	4	3	9	6	48
08:00-09:00	4	2		2	2	2	3	15
09:00-10:00	1	2		3	2	1	2	11
10:00-11:00	1	1	1				4	7
11:00-12:00		1		1	1		1	4
12:00-13:00		1	1		2	4		8
13:00-14:00	2	1		1	2		1	7
14:00-15:00	5	4	1	4		1	4	19
15:00-16:00	4	5		2	1	4	9	25
16:00-17:00	3	7	2	1	3	3	2	21
17:00-18:00	8	1	2	3	5	7	7	33
18:00-19:00	7	4	5	2	3	11	8	40
19:00-20:00	3	4	4	1	4	3	7	26
20:00-21:00	7	2		2	3	2	5	21
21:00-22:00	5	3	1		1	2	3	15
22:00-23:00	2		3	1	2	3	3	14
23:00-24:00	3	2			1	1	2	9
Total	97	59	39	39	47	74	100	455

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-01:00	0,9%	0,2%	0,0%	0,4%	0,0%	0,7%	0,4%	2,6%
01:00-02:00	0,0%	0,0%	0,2%	0,0%	0,2%	0,7%	0,7%	1,8%
02:00-03:00	0,0%	0,2%	0,4%	0,4%	0,2%	0,4%	0,2%	2,0%
03:00-04:00	0,4%	0,0%	0,2%	0,0%	0,4%	0,4%	1,3%	2,9%
04:00-05:00	0,9%	0,4%	0,4%	0,2%	0,2%	0,0%	0,4%	2,6%
05:00-06:00	2,4%	0,7%	0,7%	0,0%	0,7%	1,8%	2,2%	8,4%
06:00-07:00	1,8%	1,1%	0,9%	1,5%	0,9%	0,7%	2,0%	8,8%
07:00-08:00	2,9%	1,5%	1,3%	0,9%	0,7%	2,0%	1,3%	10,5%
08:00-09:00	0,9%	0,4%	0,0%	0,4%	0,4%	0,4%	0,7%	3,3%
09:00-10:00	0,2%	0,4%	0,0%	0,7%	0,4%	0,2%	0,4%	2,4%
10:00-11:00	0,2%	0,2%	0,2%	0,0%	0,0%	0,0%	0,9%	1,5%
11:00-12:00	0,0%	0,2%	0,0%	0,2%	0,2%	0,0%	0,2%	0,9%
12:00-13:00	0,0%	0,2%	0,2%	0,0%	0,4%	0,9%	0,0%	1,8%
13:00-14:00	0,4%	0,2%	0,0%	0,2%	0,4%	0,0%	0,2%	1,5%
14:00-15:00	1,1%	0,9%	0,2%	0,9%	0,0%	0,2%	0,9%	4,2%
15:00-16:00	0,9%	1,1%	0,0%	0,4%	0,2%	0,9%	2,0%	5,5%
16:00-17:00	0,7%	1,5%	0,4%	0,2%	0,7%	0,7%	0,4%	4,6%
17:00-18:00	1,8%	0,2%	0,4%	0,7%	1,1%	1,5%	1,5%	7,3%
18:00-19:00	1,5%	0,9%	1,1%	0,4%	0,7%	2,4%	1,8%	8,8%
19:00-20:00	0,7%	0,9%	0,9%	0,2%	0,9%	0,7%	1,5%	5,7%
20:00-21:00	1,5%	0,4%	0,0%	0,4%	0,7%	0,4%	1,1%	4,6%
21:00-22:00	1,1%	0,7%	0,2%	0,0%	0,2%	0,4%	0,7%	3,3%
22:00-23:00	0,4%	0,0%	0,7%	0,2%	0,4%	0,7%	0,7%	3,1%
23:00-24:00	0,7%	0,4%	0,0%	0,0%	0,2%	0,2%	0,4%	2,0%
Total	21,3%	13,0%	8,6%	8,6%	10,3%	16,3%	22,0%	100,0%

3.6. Trucks and Buses per Month per Day

The most fatal crashes where trucks were involved occurred on Saturdays and Sundays with 497 or 22.2% and 422 or 18.9% such crashes recorded respectively. Mort fatal truck related crashes occur in June and December with 233 or 10.4% and 217 or 9.7% such crashes recorded respectively. The latter is illustrated in Table 12 below.

Table 12 Trucks involved in fatal crashes per Month and Day

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
Jan	31	16	20	21	17	25	24	154
Feb	35	19	15	16	19	33	41	178
Mar	43	17	18	23	12	35	37	185
Apr	22	23	14	10	21	32	36	158
May	37	22	22	21	15	22	42	181
Jun	35	39	32	20	23	32	52	233
Jul	31	22	25	17	9	22	37	163
Aug	36	14	16	18	24	31	58	197
Sep	37	25	30	18	21	32	40	203
Oct	30	26	26	16	19	37	38	192
Nov	39	14	17	15	19	30	42	176
Dec	46	30	22	18	21	30	50	217
Total	422	267	257	213	220	361	497	2 237

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
Jan	1,4%	0,7%	0,9%	0,9%	0,8%	1,1%	1,1%	6,9%
Feb	1,6%	0,8%	0,7%	0,7%	0,8%	1,5%	1,8%	8,0%
Mar	1,9%	0,8%	0,8%	1,0%	0,5%	1,6%	1,7%	8,3%
Apr	1,0%	1,0%	0,6%	0,4%	0,9%	1,4%	1,6%	7,1%
May	1,7%	1,0%	1,0%	0,9%	0,7%	1,0%	1,9%	8,1%
Jun	1,6%	1,7%	1,4%	0,9%	1,0%	1,4%	2,3%	10,4%
Jul	1,4%	1,0%	1,1%	0,8%	0,4%	1,0%	1,7%	7,3%
Aug	1,6%	0,6%	0,7%	0,8%	1,1%	1,4%	2,6%	8,8%
Sep	1,7%	1,1%	1,3%	0,8%	0,9%	1,4%	1,8%	9,1%
Oct	1,3%	1,2%	1,2%	0,7%	0,8%	1,7%	1,7%	8,6%
Nov	1,7%	0,6%	0,8%	0,7%	0,8%	1,3%	1,9%	7,9%
Dec	2,1%	1,3%	1,0%	0,8%	0,9%	1,3%	2,2%	9,7%
Total	18,9%	11,9%	11,5%	9,5%	9,8%	16,1%	22,2%	100,0%

The most fatal crashes where buses were involved occurred on Saturdays and Sundays with 68 or 21.2% and 67 or 20.7% such crashes recorded respectively. Fatal crashes where buses were involved occur throughout the year with slightly more fatal bus related bus crashes occurring in March, April, September, October and November.

Table 13 below depicts the above.

Table 13 Buses involved in fatal crashes per Month and Day

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
Jan	4	8	3	1	2	3	6	27
Feb	3	3	4	1	4	1	4	20
Mar	6	3	4	1	4	10	5	33
Apr	6	5	3	2	4	5	6	31
May	5	3	5	5	3	2	4	27
Jun	4	2	1	2	1	6	6	22
Jul	5	2	3	1	2	6	4	23
Aug	5	3		4	4	7	3	26
Sep	7	5	2	2	3	3	10	32
Oct	10	4	4	2	2	3	7	32
Nov	7	3	1	4	2	3	11	31
Dec	5	2	1	3	3	3	2	19
Total	67	43	31	28	34	52	68	323

Time Bin	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
Jan	0,1%	0,2%	0,1%	0,0%	0,1%	0,1%	0,2%	1,2%
Feb	0,1%	0,1%	0,1%	0,0%	0,1%	0,0%	0,1%	0,9%
Mar	0,2%	0,1%	0,1%	0,0%	0,1%	0,3%	0,1%	1,5%
Apr	0,2%	0,1%	0,1%	0,1%	0,1%	0,1%	0,2%	1,4%
May	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	1,2%
Jun	0,1%	0,1%	0,0%	0,1%	0,0%	0,2%	0,2%	1,0%
Jul	0,1%	0,1%	0,1%	0,0%	0,1%	0,2%	0,1%	1,0%
Aug	0,1%	0,1%	0,0%	0,1%	0,1%	0,2%	0,1%	1,2%
Sep	0,2%	0,1%	0,1%	0,1%	0,1%	0,1%	0,3%	1,4%
Oct	0,3%	0,1%	0,1%	0,1%	0,1%	0,1%	0,2%	1,4%
Nov	0,2%	0,1%	0,0%	0,1%	0,1%	0,1%	0,3%	1,4%
Dec	0,1%	0,1%	0,0%	0,1%	0,1%	0,1%	0,1%	0,8%
Total	20,7%	13,3%	9,6%	8,7%	10,5%	16,1%	21,1%	14,4%

3.7. Hazardous Road Segments

Further analysis of the data provides the top 20 road segments within defined SAPS areas with the most fatal truck and bus crashes respectively.

To provide context, the Top 20 road segments in South Africa with the most fatal crashes for all vehicle types are depicted in Table 14 below. The most fatal crashes i.e., 135 fatal crashes were recorded R71 within the Mankweng SAPS area in Limpopo.

Note should be taken that the Top 20 Hazardous Road segments are ordered by the number of fatal crashes which means that a segment of road with a lower number of fatal crashes and higher fatalities might be ranked higher, such as the segment of road on the N1 in the Mookgophong (Naboomspruit) SAPS Area in Limpopo which is ranked 10th highest.

Table 14 Hazardous Road Segments (all vehicle types)

Top 20	Road	SAPS Area	Prov	Vehicles Involved	Fatal Crashes
1	R71	MANKWENG	LP	165	135
2	R573	KWAMHLANGA	MP	149	117
3	R61	MZAMBA	EC	130	112
4	N2	DUTYWA	EC	157	111
5	N2	LIBODE	EC	137	110
6	N2	UMKOMAAS	KZN	128	107
7	N2	MOUNT AYLIFF	EC	125	103
8	N2	PONGOLA	KZN	127	101
9	N4	NELSPRUIT	MP	141	99
10	N1	NABOOMSPRUIT	LP	157	98
11	N4	VOSMAN	MP	133	95
12	N12	POTCHEFSTROOM	NW	125	95
13	R61	LIBODE	EC	113	93
14	R37	MECKLENBURG	LP	122	91
15	N3	HARRISMITH	FS	138	86
16	M35	FOLWENI	KZN	109	83
17	R61	MTHATHA	EC	107	82
18	N2	MOUNT FRERE	EC	112	81
19	N2	MTHATHA	EC	115	79
20	N12	KLERKSDORP	NW	105	79

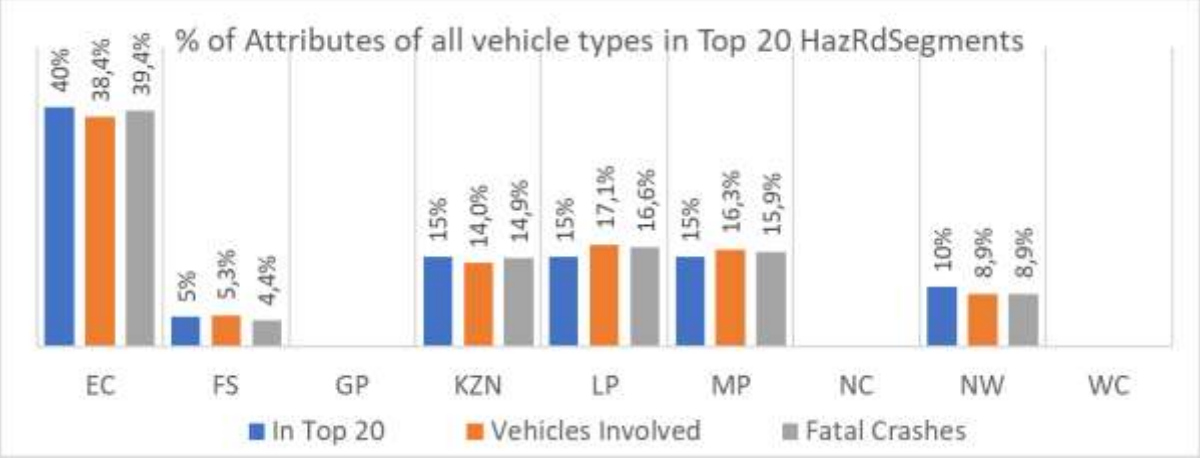
The rationale that Hazardous Segments need to be ordered by the number of fatal crashes rather than by the number of is, per example: - a road segment with 20 fatal crashes where 20 persons are killed should rank higher that a road segment where 2 fatal crashes occurred with 30 fatalities.

The province with the most road segments within the Top 20 is the Eastern Cape with 8 road segments with 935 fatalities recorded in fatal crashes (all vehicles), depicted in Table 15 and Figure 13 below. None of the Top 20 hazardous road segments are in the Gauteng, Western Cape and Northern Cape provinces.

Table 15 Hazardous Road Segments – provincial split – Top 20

Prov	In Top 20	Vehicles Involved	Fatal Crashes
EC	8	996	771
FS	1	138	86
GP			
KZN	3	364	291
LP	3	444	324
MP	3	423	311
NC			
NW	2	230	174
WC			
Total	20	2 579	1 959

Figure 13 % Provincial split - Top 20 Hazardous Road Segments (all vehicle types)



The most fatal crashes where trucks were involved over the study period were recorded on the N3 in the Harrismith SAPS Area in the Free State province where 44 trucks were involved in 26 fatal crashes with 45 fatalities recorded, depicted in Table 16 below. The most fatal truck related crashes in the Top 20 were recorded on the N3 with 47 fatal crashes, N1 with 39 fatal crashes, N2 with 33 fatal crashes and the N4 with 25 fatal crashes in the respective SAPS Areas.

Table 16 Truck Fatal Crashes (ordered by the number of Fatal Crashes)

Top 20	Road	SAPS Area	Prov	Vehicles Involved	Fatal Crashes
1	N3	HARRISMITH	FS	44	26
2	N1	MUSINA	LP	30	18
3	N3	VAN REENEN	KZN	19	14
4	N11	MIDDELBURG (MP)	MP	20	13
5	N12	KLERKSDORP	NW	16	12
6	N1	DE DOORNS	WC	15	11
7	N12	POTCHEFSTROOM	NW	15	11
8	N1	MAKHADO	LP	16	10
9	N2	PIET RETIEF	MP	18	9
10	N2	KWAMSANE	KZN	13	9
11	N4	KOMATIPOORT	MP	9	9
12	N4	NELSPRUIT	MP	12	9
13	N2	PONGOLA	KZN	13	8
14	N2	MKHUZE	KZN	11	7
15	N3	HOWICK	KZN	9	7
16	N4	MIDDELBURG (MP)	MP	12	7
17	R37	DRIEKOP	LP	14	7
18	R37	LEBOWAKGOMO	LP	8	7
19	R102	MONTCLAIR	KZN	7	7
20	R101	MOKOPANE	LP	10	7

A Total of 71.2% or 148 of the fatal truck related crashes occurred in the KwaZulu-Natal, Limpopo and the Mpumalanga provinces. The province with the most road segments with truck related fatal crashes within the Top 20 is the KwaZulu-Natal province with 6 road segments followed closely by the Limpopo and Mpumalanga provinces with 5 road segments each. None of the top 20 hazardous road segments

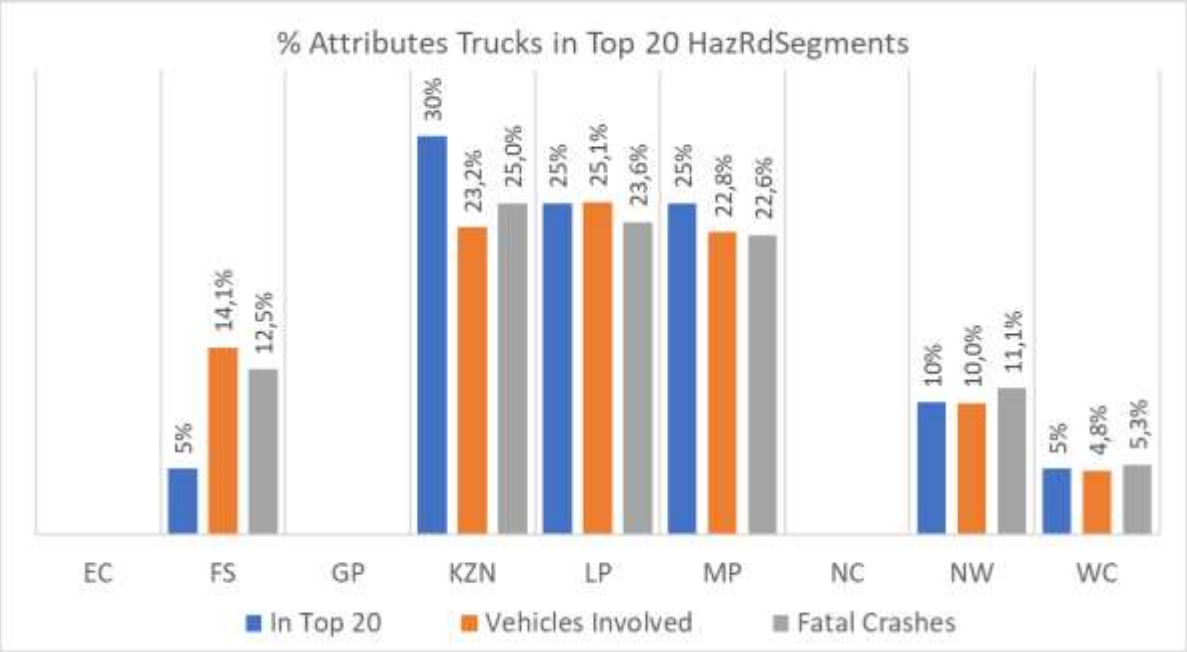
with truck related fatal crashes are in the Eastern Cape, Gauteng and Northern Cape provinces.

The above is depicted in Table 17 and Figure 14 below.

Table 17 Provincial split within the Top 20 Hazardous Road Segments

Prov	In Top 20	Vehicles Involved	Fatal Crashes
EC			
FS	1	44	26
GP			
KZN	6	72	52
LP	5	78	49
MP	5	71	47
NC			
NW	2	31	23
WC	1	15	11
Total	20	311	208

Figure 14 % Provincial split - Top 20 Hazardous Road Segments (trucks)



The most fatal crashes where buses were involved over the study period were recorded on the R573 in the Kwamhlanga SAPS Area in the Mpumalanga province with 8 such fatal crashes. The top 20 Hazardous Road Segments are tabled below.

Table 18 Bus Fatal Crashes (ordered by the number of Fatal Crashes)

Top 20	Road	SAPS Area	Prov	Vehicles Involved	Fatal Crashes
1	R573	KWAMHLANGA	MP	8	5
2	N1	MAKHADO	LP	6	4
3	N1	MUSINA	LP	5	3
4	N1	POLOKWANE	LP	4	2
5	N1	THE BARRAGE	GP	3	2
6	N1	LAINGSBURG	WC	2	2
7	N2	HARDING	KZN	2	2
8	N2	MOUNT AYLIFF	EC	2	2
9	N3	HARRISMITH	FS	4	2
10	N3	VILLIERS	FS	3	2
11	N3	ROADSIDE	FS	5	2
12	R573	CULLINAN	GP	4	2
13	N4	GROOT MARICO	NW	3	2
14	R81	MODJADJISKLOOF	LP	3	2
15	OTTO DU PLESSIS DRIVE	TABLE VIEW	WC	2	2
16	R523	SILOAM	LP	2	2
17	MANGOSUTHU HIGHWAY (M30)	UMLAZI	KZN	2	2
18	FUEL ROAD	SOPHIA TOWN	GP	2	2
19	MOOKI STREET	ORLANDO	GP	2	2
20	R37	MECKLENBURG	LP	3	2

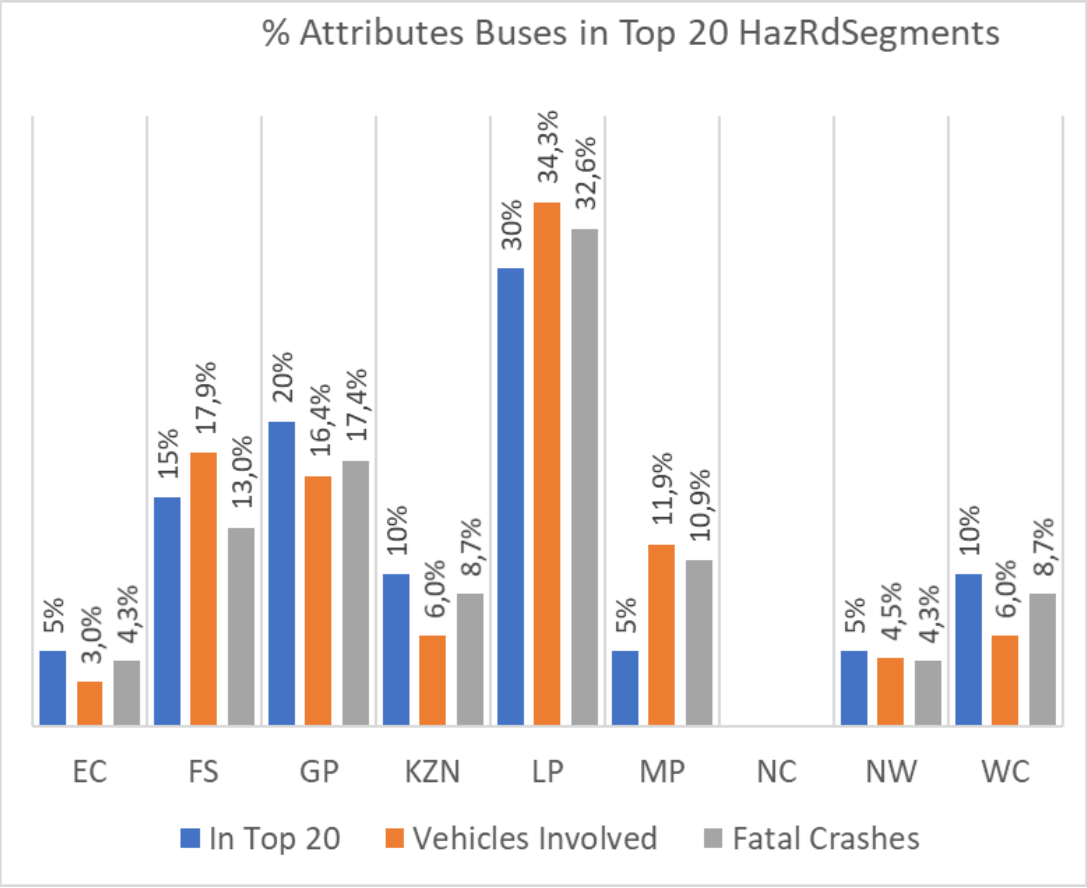
The province with the most road segments with bus related fatal crashes within the Top 20 is the Limpopo province with 6 road segments or 32.6%. None of the top 20 hazardous road segments with bus related fatal crashes are in the Northern Cape provinces.

The above is depicted in Table 19 and Figure 15 below.

Table 19 Provincial split - Top 20 Hazardous Road Segments (buses)

Prov	In Top 20	Vehicles Involved	Fatal Crashes
EC	1	2	2
FS	3	12	6
GP	4	11	8
KZN	2	4	4
LP	6	23	15
MP	1	8	5
NC	0	0	0
NW	1	3	2
WC	2	4	4
Total	1	2	2

Figure 15 % Provincial split - Top 20 Hazardous Road Segments (buses)



3.8. Fatal crashes per Crash Type per Province (Trucks and Buses)

A total of 779 or 34.8% fatal truck related crashes were recorded as, 'Crash with pedestrian'. The most truck related fatal crashes were recorded as 'Crash with pedestrian' in the Kwa-Zulu-Natal, Gauteng, and Eastern Cape provinces with 158 or 6.6%, 137 or 6.1% and 102 or 4.6% of all truck related fatal crashes, respectively.

The top 5 recorded crash types where trucks are involved were 'Crash with pedestrian', 'Head-on', 'Head/rear end', 'Single vehicle (overturned)' and Sideswipe (opposite direction) which in total constitutes 1 772 or 79.2% of all truck related fatal crashes recorded in the study period.

The most truck related fatal crashes were recorded in the Kwa-Zulu Natal province with 500 of the 2 237 such crashes or 22.4% of all fatal truck related crashes during the study period.

The Top 15 cash types where trucks were involved in fatal crashes are depicted in Tables 20 and 21 below.

Table 20 Truck fatal crashes per crash type per province

Crash Type	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
Accident with pedestrian	102	64	137	158	69	104	20	54	71	779
Head on	32	43	26	58	46	54	16	31	14	320
Head/rear end	11	26	58	57	28	31	1	21	12	245
Single vehicle (overturned)	42	13	12	72	28	39	8	16	14	244
Sideswipe (opposite directions)	10	24	17	41	19	36	6	13	18	184
Sideswipe (same direction)	7	9	18	13	8	16	1	5	6	83
Hit and Run	3	4	5	40	3	7	2	2	4	70
Approach at angle (both trav. straight)	3	8	14	14	6	17	1	3	1	67
Accident with Pedal Cyclist	3	2	16	8	4	10		7	6	56
Person fell off	11	5	9	15	1	2	1	4	3	51
Single vehicle (left the road)	7	7	2	4		11	1	2	11	45
Accident with fixed/other object	2	5	10	12	4	6		1	5	45
Approach at angle, One or both turning			7	3	3	5	1			19
Unknown			10	1		5		2	1	19
Jack Knife			1	2			1		1	5
Other		2		2					1	5
Total	233	212	342	500	219	343	59	161	168	2 237

Table 21 % Truck fatal crashes per crash type per province

Crash Type	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
Accident with pedestrian	4,6%	2,9%	6,1%	7,1%	3,1%	4,6%	0,9%	2,4%	3,2%	34,8%
Head on	1,4%	1,9%	1,2%	2,6%	2,1%	2,4%	0,7%	1,4%	0,6%	14,3%
Head/rear end	0,5%	1,2%	2,6%	2,5%	1,3%	1,4%	0,0%	0,9%	0,5%	11,0%
Single vehicle (overturned)	1,9%	0,6%	0,5%	3,2%	1,3%	1,7%	0,4%	0,7%	0,6%	10,9%
Sideswipe (opposite directions)	0,4%	1,1%	0,8%	1,8%	0,8%	1,6%	0,3%	0,6%	0,8%	8,2%
Sideswipe (same direction)	0,3%	0,4%	0,8%	0,6%	0,4%	0,7%	0,0%	0,2%	0,3%	3,7%
Hit and Run	0,1%	0,2%	0,2%	1,8%	0,1%	0,3%	0,1%	0,1%	0,2%	3,1%
Approach at angle (both trav. straight)	0,1%	0,4%	0,6%	0,6%	0,3%	0,8%	0,0%	0,1%	0,0%	3,0%
Accident with Pedal Cyclist	0,1%	0,1%	0,7%	0,4%	0,2%	0,4%	0,0%	0,3%	0,3%	2,5%
Person fell off	0,5%	0,2%	0,4%	0,7%	0,0%	0,1%	0,0%	0,2%	0,1%	2,3%
Single vehicle (left the road)	0,3%	0,3%	0,1%	0,2%	0,0%	0,5%	0,0%	0,1%	0,5%	2,0%
Accident with fixed/other object	0,1%	0,2%	0,4%	0,5%	0,2%	0,3%	0,0%	0,0%	0,2%	2,0%
Approach at angle, One or both turning	0,0%	0,0%	0,3%	0,1%	0,1%	0,2%	0,0%	0,0%	0,0%	0,8%
Unknown	0,0%	0,0%	0,4%	0,0%	0,0%	0,2%	0,0%	0,1%	0,0%	0,8%
Jack Knife	0,0%	0,0%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%	0,0%	0,2%
Other	0,0%	0,1%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%	0,0%	0,2%
Total	10,4%	9,5%	15,3%	22,4%	9,8%	15,3%	2,6%	7,2%	7,5%	

The most bus related fatal crashes were recorded as 'Crash with pedestrian' fatal crashes with 207 or 64.1% of all fatal bus related crashes.

The top 5 recorded crash types where buses are involved were 'Crash with pedestrian', 'Head-on', 'Head/rear end', 'Single vehicle (overturned)', Person fell off' and 'Sideswipe (opposite direction)' which in total constitutes 281 or 87.0% of all bus related fatal crashes recorded in the study period.

The most bus related fatal crashes were recorded in the Gauteng province with 56 of the 323 such crashes or 23.5% of all fatal bus related crashes during the study period.

The Top 15 cash types where buses were involved in fatal crashes are depicted in Tables 22 and 23 below.

Table 22 Bus fatal crashes per crash type per province

Crash Type	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
Accident with pedestrian	20	12	57	34	19	26	4	14	21	207
Head on	6	6	5	3	3	3	1	1	2	30
Single vehicle (overturned)	6		2	4	5	1		1	2	21
Person fell off	2	1	1	3	3			2		12
Sideswipe (opposite directions)	1	1	1		5	1			2	11
Head/rear end		3	1	1	1	1		1		8
Hit and Run	1		3		1	1				6
Accident with fixed/other object	1		1	2	2					6
Approach at angle (both trav. straight)		1	1	3						5
Sideswipe (same direction)					1	1	1		1	4
Accident with Pedal Cyclist	1	1		1						3
Approach at angle, One or both turning			2						1	3
Single vehicle (left the road)					1	1			1	3
Unknown			2							2
Accident with animal				1					1	2
Total	38	25	76	52	41	35	6	19	31	323

Table 23 % Bus fatal crashes per crash type per province

Crash Type	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
Accident with pedestrian	6,2%	3,7%	17,6%	10,5%	5,9%	8,0%	1,2%	4,3%	6,5%	64,1%
Head on	1,9%	1,9%	1,5%	0,9%	0,9%	0,9%	0,3%	0,3%	0,6%	9,3%
Head/rear end	1,9%	0,0%	0,6%	1,2%	1,5%	0,3%	0,0%	0,3%	0,6%	6,5%
Single vehicle (overturned)	0,6%	0,3%	0,3%	0,9%	0,9%	0,0%	0,0%	0,6%	0,0%	3,7%
Sideswipe (opposite directions)	0,3%	0,3%	0,3%	0,0%	1,5%	0,3%	0,0%	0,0%	0,6%	3,4%
Sideswipe (same direction)	0,0%	0,9%	0,3%	0,3%	0,3%	0,3%	0,0%	0,3%	0,0%	2,5%
Hit and Run	0,3%	0,0%	0,9%	0,0%	0,3%	0,3%	0,0%	0,0%	0,0%	1,9%
Approach at angle (both trav. straight)	0,3%	0,0%	0,3%	0,6%	0,6%	0,0%	0,0%	0,0%	0,0%	1,9%
Accident with Pedal Cyclist	0,0%	0,3%	0,3%	0,9%	0,0%	0,0%	0,0%	0,0%	0,0%	1,5%
Person fell off	0,0%	0,0%	0,0%	0,0%	0,3%	0,3%	0,3%	0,0%	0,3%	1,2%
Single vehicle (left the road)	0,3%	0,3%	0,0%	0,3%	0,0%	0,0%	0,0%	0,0%	0,0%	0,9%
Accident with fixed/other object	0,0%	0,0%	0,6%	0,0%	0,0%	0,0%	0,0%	0,0%	0,3%	0,9%
Approach at angle, One or both turning	0,0%	0,0%	0,0%	0,0%	0,3%	0,3%	0,0%	0,0%	0,3%	0,9%
Unknown	0,0%	0,0%	0,6%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,6%
Jack Knife	0,0%	0,0%	0,0%	0,3%	0,0%	0,0%	0,0%	0,0%	0,3%	0,6%
Total	1,7%	1,1%	3,4%	2,3%	1,8%	1,6%	0,3%	0,8%	1,4%	

3.9. Owner Province (Trucks and Buses)

A total of 4 001 trucks and buses were involved in fatal crashes during the study period in 2 560 fatal crashes. 3 340 or 82.1% of the recorded vehicle registrations were traced to NaTIS and categorised per 'owner province' which indicates in which province the owners reside. The top 25 owners of trucks and buses were identified and ranked by most truck and bus crashes respectively and per province where such owners reside. Table 24 below depicts the latter.

Table 24 Top 25 'Owner province'- truck and bus crashes

ID	Owner Province	Trucks
T1	MP	12
T2	MP	11
T3	MP	8
T4	MP	8
T5	MP	8
T6	FS	7
T7	MP	6
T8	KZN	5
T9	MP	5
T10	FS	5
T11	KZN	5
T12	EC	5
T13	MP	5
T14	NC	5
T15	EC	5
T16	GP	5
T17	MP	4
T18	MP	4
T19	MP	4
T20	KZN	4
T21	GP	4
T22	FS	4
T23	GP	4
T24	MP	4
T25	MP	4

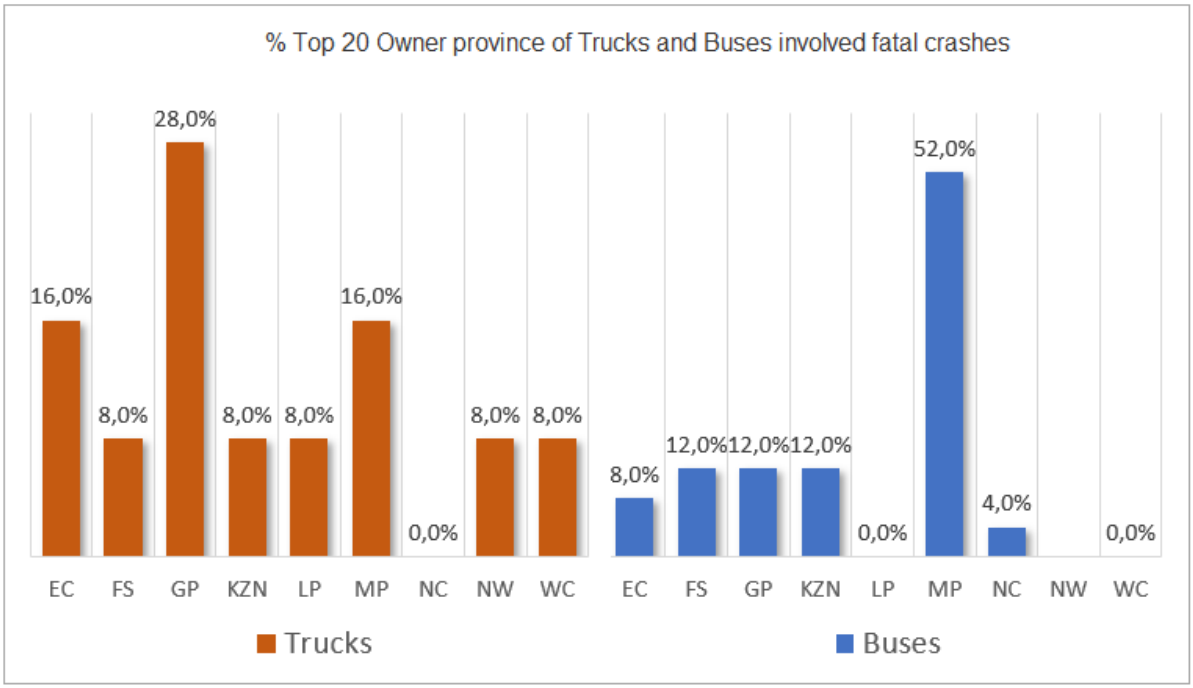
ID	Owner Province	Buses
B1	KZN	16
B2	GP	15
B3	WC	14
B4	MP	11
B5	EC	10
B6	FS	9
B7	MP	9
B8	MP	8
B9	EC	6
B10	NW	6
B11	EC	5
B12	GP	5
B13	GP	5
B14	MP	5
B15	GP	4
B16	WC	4
B17	GP	4
B18	GP	4
B19	NW	3
B20	FS	3
B21	GP	3
B22	LP	3
B23	EC	3
B24	KZN	3
B25	LP	3

In line with the stipulations of the Protection of Personal Information Act (POPIA), 2013, the identity and exact location of the owners of the vehicles that were involved in the fatal crashes are not reported on, only the province in which the owner/business resides are provided to provide context in which provinces such owners reside.

The RTMC will plan and action applicable investigation to collectively discuss and address possible road safety related challenges with owners whose trucks or buses contribute most to related fatal crashes.

A total of 28.0% of truck owners/business reside in the Gauteng province with 52% of bus owners/business residing in the Mpumalanga province, depicted by Figure 16 below.

Figure 16 % of Top 20 owners in province of vehicle type in fatal crashes



4 COST OF FATAL TRUCK AND BUS CRASHES

The high number of road traffic crashes and their associated consequences has a significant impact on South African society, which in turn continues to hamper socio-economic development and affects the well-being of all South Africans. This impact is measured in terms of human lives lost, "pain, grief and suffering", as well as an increasing cost to the economy[2].

A study to determine the Cost of Crashes for South Africa for 2015 was published in September 2016 by the RTMC. Calculating the cost of crashes included human casualty costs, vehicle repair costs and incident costs which was and estimated R142.6 billion for 2015. The RTMC calculate/adjust the cost of crashes on an annual basis with respective annual Consumer Price Index (CPI) and the number of fatal crashes and fatalities per year.

The cost of crashes study published by the RTMC in 2016 provides for the calculation of the cost of crashes on a section/s of road by using calculated severity costs for the unit costs per person, the unit cost per incident (crash) by severity and unit cost per vehicle type. In addition, ratios are provided to calculate serious injury, slight injury and no-injury where not known. The cost of crashes methodology adds 5% to the number of injuries, in line with international best practice, to allow for underreporting.

The above was used to calculate the cost of the 4 001 fatal truck and bus crashes over the study period to the South African economy.

Table 25 below provide the quantification for the cost of the 4 001 fatal crashes to the economy which is an estimated R 37.2 billion.

[2] RTMC - Cost of Crashes in South Africa - 2016

Table 25 Estimated cost of truck and bus crashes

Estimated Cost of fatal Truck and Bus Crashes (2018 - 2022)				
CoC in SA, published 2016 for 2015				2022 Adjusted
CoC 2016 - Table 12: Unit cost per person by severity of RTI (Rand)				
Area	Death	Serious	Slight	No Injury
Anywhere	5 522 442	597 707	100 618	1 530
Urban	5 646 437	618 567	101 871	1 905
Rural	3 385 016	569 802	98 188	853
CoC 2016 - Table 13: Unit cost per incident (crash) by severity of RTC (Rand) Area				
Area	Fatal	Major	Minor	Damage Only
Anywhere	255 368	179 742	29 137	27 664
Urban	276 958	184 357	33 983	31 720
Rural	216 060	171 396	20 415	20 213
CoC 2016 - Table 14: Unit cost per vehicle type (Rand)				
Vehicle Type	Anywhere	Urban	Rural	
Sedan	20 536	20 326	21 168	
Minibus	20 670	20 456	21 310	
Midi-bus & Bus	21 344	21 114	22 034	
Light delivery vehicle	20 463	20 254	21 088	
Goods vehicle	21 842	21 601	22 568	
Heavy goods vehicle	30 777	30 317	32 156	
Any vehicle	20 601	20 389	21 237	

Estimated Cost of Crashes:		R 31 872 021 446		R 5 283 693 508		R 37 155 714 954
Crash Type	*Ratio	**Truck Fatal Crashes	Trucks Est. Cost (ZAR)	**Bus Fatal Crashes	Buses Est. Cost (ZAR)	Buses Est. Cost (ZAR)
Deaths	1	3 072	16 966 598 130	511	2 823 900 646	19 790 498 776
Serious Injury	4,6	14 839	8 869 494 468	2 470	1 476 228 232	10 345 722 700
Slight Injury	14,9	48 066	4 836 298 191	8 000	804 947 785	5 641 245 976
No Injury	105,2	339 366	519 237 594	56 484	86 421 295	605 658 889
Person Costs			31 191 628 384	2 926	5 191 497 957	36 383 126 341
Fatal		2 237	571 258 901	323	82 483 963	653 742 864
Major			-			
Minor			-			
Damage Only			-			
Incident Costs			571 258 901	2 237	82 483 963	653 742 864
Sedan					-	-
Minibus					-	-
Midi-bus & Bus				455	9 711 588	9 711 588
Light delivery vehicle					-	-
Goods vehicle					-	-
Heavy goods vehicle		3 546	109 134 161		-	-
Any vehicle					-	-
Vehicle Cost			109 134 161		9 711 588	118 845 749

*Ratio calculated in CoC, 2016 for Major, Minor and Damage only crashes

**5% added for underreporting in line with CoC, 2016

5 SUMMARY OF KEY FINDINGS

Statistics on the number of vehicles involved in fatal crashes, the type of vehicles involved in fatal crashes and fatalities are included in the RTMC annual State of Road Safety Report (SORSR). More in-depth analysis on trucks and buses involved in fatal crashes is needed to provide tailor-made interventions to reduce fatalities and serious injury due to such crashes.

The aim of this report is to provide input to road safety programmes regarding the trucks and buses involved in fatal crashes.

Fatal crash data recorded on the RTMC National Crash Data Management System (NCDMS) was used for trucks and buses involved in fatal crashes between 1 January 2018 and 31 December 2022, a period of 5 years, 60 months, or 1,826 days.

A total of 4 001 trucks and buses were involved in fatal crashes during the study period in 2 560 fatal crashes with 3 413 fatalities recorded with a combined crash severity of 1.33 (average fatalities per crash). 3 340 or 82.1% of the recorded vehicle registrations were traced to NaTIS and categorised per 'owner province'.

A total of 3 546 trucks were involved in 2 237 fatal crashes with 2 926 fatalities recorded in such crashes with an average crash severity of 1.33. The Kwazulu-Natal province recorded the highest number of fatal crashes where trucks were involved with 22.4% or 500 such crashes. The lowest number of fatal crashes where trucks were involved were recorded in the Northern Cape province with only 2.5% or 59 such fatal crashes.

The average crash severity (number of fatalities per crash) for crashes where trucks were involved in South Africa over the study period is higher than for fatal crashes where all vehicles were involved i.e., 1.2. For truck fatal crashes, the crash severity range from 1.2 in the Gauteng, Eastern Cape and Western Cape provinces to 1.8 in the Free State province.

A total of 455 buses were involved in 323 fatal crashes with 487 fatalities recorded in such crashes. The Gauteng province recorded the highest number of fatal crashes where buses were involved with 23.5% or 76 fatal crashes where buses were involved. The lowest number of 'bus' fatal crashes were recorded in the Northern Cape province with 1.9% or 6 such fatal crashes.

The average crash severity (number of fatalities per crash) for crashes where buses were involved in South Africa over the study period is also higher than for fatal crashes where all vehicles were involved (all vehicles = 1.2). For bus fatal crashes, the crash severity range from 1.1 in the North West province to 2.4 in the Eastern Cape province.

Truck crashes were further analysed to indicate the day of the week and the time of the day during when most truck crashes occur. The most crashes where trucks were involved over the study period are between 18:00 and 22:00 on Saturdays with 187 reported crashes where trucks were involved or 5.3% of such crashes. Second highest, between 18:00 and 22:00 on Sundays with 176 or 5.0% of crashes where trucks were involved.

The most fatal crashes where trucks were involved occurred on during the four-hour period between 18:00 and 22:00 on Saturdays and Sundays with a combined total of 363 or 10.2% such fatal crashes.

The most fatal crashes where buses were involved in over the study period are between 05:00 and 08:00 on Sundays with 36 or or 7.0% of such crashes recorded. The second highest time period where buses were involved in fatal crashes were between 05:00 and 08:00 on Saturdays with 25 or or 5.5% of such crashes.

Most fatal crashes where buses were involved in occurred on Saturdays and Sundays with a combined total of 57 or 12.5% of fatal bus related crashes. The time period between 05:00 and 05:00 has the highest recorded fatal bus related crashed with 126 or 27.7% such fatal crashes.

The most fatal crashes where trucks were involved occurred on Saturdays and Sundays with 497 or 22.2% and 422 or 18.9% such crashes recorded respectively. Mort fatal truck related crashes occur in June and December with 233 or 10.4% and 217 or 9.7% such crashes recorded respectively.

The most fatal crashes where buses were involved occurred on Saturdays and Sundays with 68 or 21.2% and 67 or 20.7% such crashes recorded respectively. Fatal crashes where buses were involved occur throughout the year with slightly more fatal bus related bus crashes occurring in March, April, September, October and November.

To provide context, the Top 20 road segments in South Africa with the most fatal crashes for all vehicle types. The most fatal crashes i.e., 135 fatal crashes were recorded R71 within the Mankweng SAPS area in Limpopo.

The most fatal crashes where trucks were involved over the study period were recorded on the N3 in the Harrismith SAPS Area in the Free State province where 44 trucks were involved in 26 fatal crashes with 45 fatalities recorded. The most fatal truck related crashes in the Top 20 were recorded on the N3 with 47 fatal crashes, N1 with 39 fatal crashes, N2 with 33 fatal crashes and the N4 with 25 fatal crashes in the respective SAPS Areas.

A Total of 71.2% or 148 of the fatal truck related crashes occurred in the KwaZulu-Natal, Limpopo and the Mpumalanga provinces. The province with the most road segments with truck related fatal crashes within the Top 20 is the KwaZulu-Natal province with 6 road segments followed closely by the Limpopo and Mpumalanga provinces with 5 road segments each. None of the top 20 hazardous road segments with truck related fatal crashes are in the Eastern Cape, Gauteng and Northern Cape provinces.

The most fatal crashes where buses were involved over the study period were recorded on the R573 in the Kwamhlanga SAPS Area in the Mpumalanga province with 8 such fatal crashes.

The province with the most road segments with bus related fatal crashes within the Top 20 is the Limpopo province with 6 road segments or 32.6%. None of the top 20 hazardous road segments with bus related fatal crashes are in the Northern Cape provinces.

A total of 779 or 34.8% fatal truck related crashes were recorded as, 'Crash with pedestrian'. The most truck related fatal crashes were recorded as 'Crash with pedestrian' in the Kwa-Zulu-Natal, Gauteng, and Eastern Cape provinces with 158 or 6.6%, 137 or 6.1% and 102 or 4.6% of all truck related fatal crashes respectively.

The top 5 recorded crash types where trucks are involved were 'Crash with pedestrian', 'Head-on', 'Head/rear end', 'Single vehicle (overturned)' and Sideswipe (opposite direction) which in total constitutes 1 772 or 79.2% of all truck related fatal crashes recorded in the study period.

The most truck related fatal crashes were recorded in the Kwa-Zulu Natal province with 500 of the 2 237 such crashes or 22.4% of all fatal truck related crashes during the study period.

The most bus related fatal crashes were recorded as 'Crash with pedestrian' fatal crashes with 207 or 64.1% of all fatal bus related crashes.

The top 5 recorded crash types where buses are involved were 'Crash with pedestrian', 'Head-on', 'Head/rear end', 'Single vehicle (overturned)', Person fell off' and 'Sideswipe (opposite direction)' which in total constitutes 281 or 87.0% of all bus related fatal crashes recorded in the study period.

The most bus related fatal crashes were recorded in the Gauteng province with 56 of the 323 such crashes or 23.5% of all fatal bus related crashes during the study period.

A total of 3 340 or 82.1% of the recorded vehicle registrations were traced to NaTIS and categorised per 'owner province' which indicates in which province the owners reside. The top 25 owners of trucks and buses were identified and ranked by most truck and bus crashes respectively and per province where such owners reside.

In line with the stipulations of the Protection of Personal Information Act (POPIA), 2013, the identity and exact location of the owners of the vehicles that were involved in the fatal crashes are not reported on, only the province in which the owner/business resides are provided to provide context in which provinces such owners reside.

The RTMC will plan and action applicable investigation to collectively discuss and address possible road safety related challenges with owners whose trucks or buses contribute most to related fatal crashes.

A total of 28.0% of truck owners/business reside in the Gauteng province with 52% of bus owners/business residing in the Mpumalanga province, depicted by Figure 16 below.

This report further provides baseline analysis for further analysis as well as recommendations for further research and analysis that would provide scientific input towards reducing death and injury due to road crashes.

The estimated cost of the 4 001 fatal crashes to the economy is an estimated R 37.2 billion.

6 CONCLUSIONS AND RECOMMENDATIONS

The impact of fatal truck and bus crashes on the economy, which is an estimated R 37.2 billion over the five-year study period and the associated consequences due to the fatal crashes on the South African society, which in turn continues to hamper socio-economic development and affects the well-being of all South Africans cannot and should not be accepted.

This study provides the 'When?', the 'What?', the 'Where?' and quantifies fatal truck and bus crashes over the study period. The 'Why?' is however outstanding.

Without published evidence, it would only be speculation as to why most truck and bus crashes occur at the identified locations, during the time frames, during the different months and days of the year, on-site investigations need to be conducted to establish the 'Why' and to act on te identified causes of the fatal truck and bus crashes.

It is thus recommended that the 2023/24 study includes measures to be put in place to reduce fatal truck and bus crashes by a team which should include key stakeholders such as research, law enforcement and road safety specialists.

It is also proposed that the identified measures be actioned and evaluated by the RTMC and other relevant stakeholders and the success of the measures that were actioned are published.

It is further recommended that the data used in this study be further analysed to include inter alia:

- Local / urban split of fatal truck and bus crashes
- Infringements of identified trucks and buses prior to the fatal crashes
- Roadworthy analysis of the trucks and buses at the time of the crashes.
- The impact of foreign drivers on fatal truck and bus crashes
- Quantification of foreign trucks and buses involved in fatal crashes.

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The Road Traffic Management Corporation (RTMC) is an Agency of the Department of Transport (DoT) and a Member of the United Nations Road Safety Collaboration