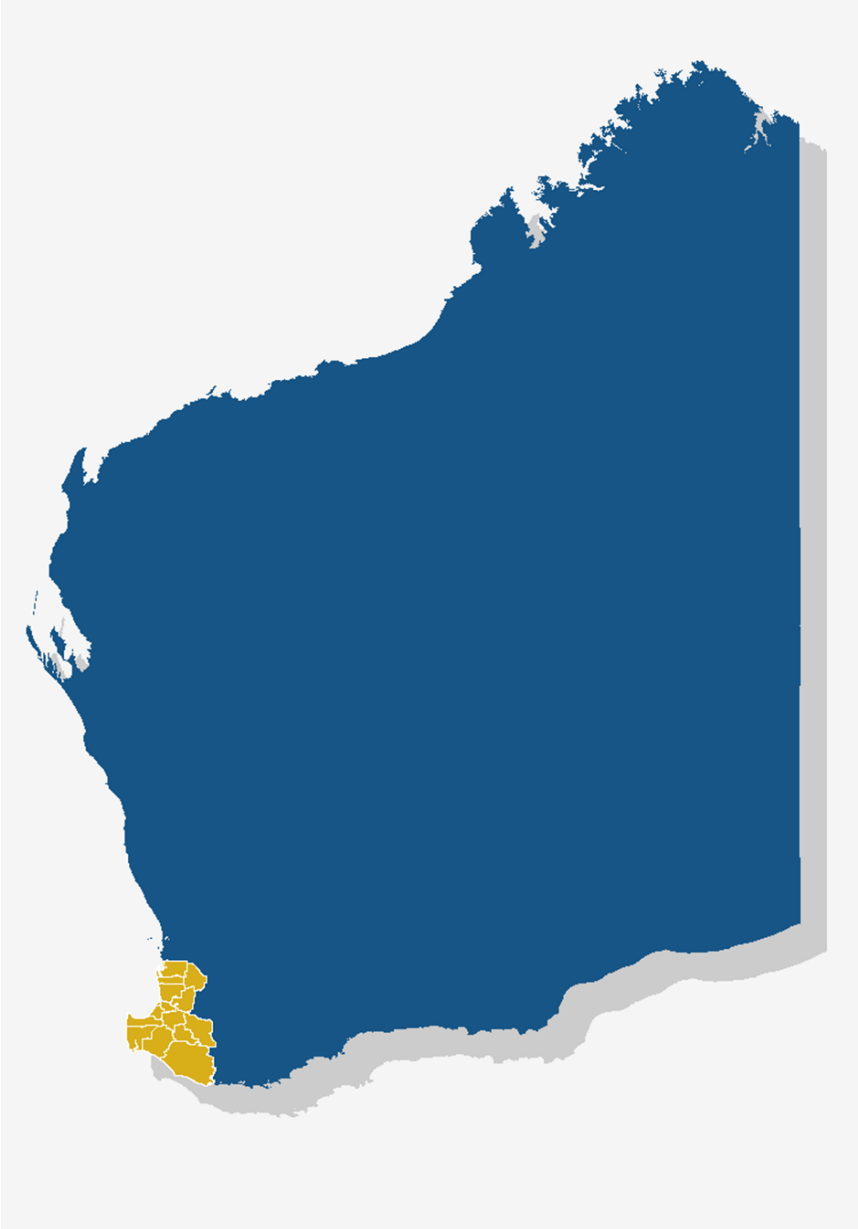
Local Road Crash Report 2012

SOUTH WEST REGION



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EXECUTIVE SUMMARY

The Local Government sector has a key role to play in road safety. It is responsible for over 128,000 kilometres of road representing 88% of the road network in Western Australia. This report provides contemporary road crash statistical information specific to the local road network and excludes state road lengths, and state and local road intersections. It will assist the Local Government sector to monitor road safety trends and performance; and improve the safety of its network.

This Local Road Crash Report for the South West Region has the following sections:

1. State level statistical summaries to enable comparison against the regional level.
2. Regional level statistical summaries for the local road network; statistical summaries for the four cornerstones in *Towards Zero*; and demographic statistical summaries.
3. Crash statistical summaries for each Local Government.

This Local Road Crash Report should be read in conjunction with the South West Region Local Road Crash Map Book 2012.

There were 2,655 people killed or seriously injured in crashes on Western Australian roads in 2012; of which 1,520 people were killed or seriously injured on the WA local road network representing 57%. In 2012 the cost of all crashes in Western Australia was $2.7billion of which $1.5billion (B) or 55% occurred on local roads. During the same period, 47% of vehicle kilometres travelled were on the local road network.

South West Region

Local roads constitute 86% of the South West Region road network.

From 2003 to 2012, there were a total of 29,631 crashes in the South West Region resulting in 1,563 people killed or seriously injured (KSI) on local roads. During this period, 58% of all crashes occurred on local roads including intersections where all legs were local roads. Midblock locations accounted for 33.3% of crashes on local roads.

The ten year trend for KSI on the South West Region local road network is increasing.

In 2012, a total of 1,567 crashes occurred on the South West Region local road network, which included 161 crashes resulting in 9 people killed and 152 people seriously injured. Over 59% of KSI in 2012 resulted from single vehicle crashes of Hit Object and Non-Collision.

The key road safety issues for the South West Region local road network are:

1. Single vehicle crashes.
2. Serious crashes in 50km/hr. speed zones.
3. Speed and inattention.
4. Over-representation of males in KSI outcomes especially motorcyclists and bicyclists.

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1. INTRODUCTION

The road network in Western Australia comprises state and national roads under the management of Main Roads Western Australia; local roads under the management of Local Government; and other roads such as forestry and national park roads under the management of the Department of Parks and Wildlife. Local Government is responsible for over 128,000 kilometres of roads, which is 88% of the Western Australian road network; therefore the sector has a key role to play in road safety.

This report provides contemporary annual road crash information dedicated to the local road network. The aim of this report is to provide informative road crash information to support strategic and operational decision-making on matters, such as, Safe System improvements to the local road network, network funding, road network management and performance monitoring. In addition, the information contained within this report will inform road safety partners of the issues faced by Local Government to deliver road safety outcomes.

This report will be a valuable tool in monitoring the road safety performance of the local road network in the South West Region, which is comprised of the following Local Governments:

Shire of Augusta-Margaret River; Shire of Boddington; Shire of Boyup Brook; Shire of Bridgetown-Greenbushes; City of Bunbury; City of Busselton; Shire of Capel; Shire of Collie; Shire of Dardanup; Shire of Donnybrook-Balingup; Shire of Harvey; City of Mandurah; Shire of Manjimup; Shire of Murray; Shire of Nannup; and Shire of Waroona.

1.1 Towards Zero WA State Road Safety Strategy

Towards Zero is the Western Australian Road Safety Strategy 2008-2020. *Towards Zero* incorporates the Safe System, which views the road transport system holistically by seeking to manage the interaction between road users, roads, travel speeds and vehicles. The Safe System recognises it is probably not possible to prevent all crashes but aims to prevent those resulting in death and serious injury. The ‘Safe System’ is diagrammatically displayed in Figure 1.

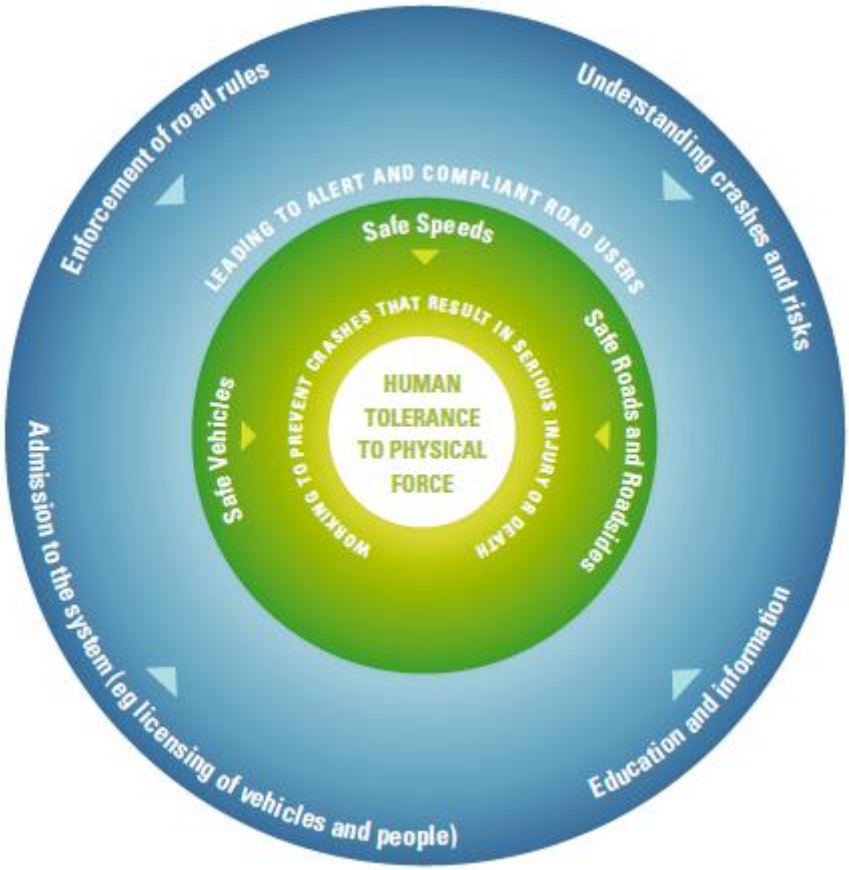

Figure 1: The Safe System (adapted from ATC, 2007)

1.2 Safe System Cornerstones

The Safe System identifies four cornerstones that should be adopted in a road safety strategy: safe road use, safe roads and roadsides, safe speeds, and safe vehicles.

1.2.1 Safe Road Use

Influencing road user behaviour by:

- advising, educating and encouraging road users to comply with road rules;
- encouraging road users to drive unimpaired and alert, and according to the prevailing conditions;
- managing the gradual introduction of new drivers into the system and understanding their specific needs; and
- taking action against those who break the rules.

1.2.2 Safe Roads and Roadsides

Improving road infrastructure by:

- designing and maintaining roads and roadsides to reduce the risk of crashes occurring and the severity of injury if a crash does occur; and
- providing a transport system that supports safe outcomes.

1.2.3 Safe Speeds

Ensuring speed limits and travel speeds reflect the safety of the road infrastructure by:

- undertaking speed enforcement and education; and
- establishing speed limits according to the features of the road and roadside, vehicle crash-worthiness and the functional performance and known limits of the road user.

1.2.4 Safe Vehicles

Improving the safety of the vehicles in the road system by:

- promoting safety features that reduce the likelihood of a crash (and reduce the impact of the crash on vehicle occupants as well as pedestrians and cyclists);
- encouraging consumers and businesses to purchase safer vehicles; and
- implementing mandatory safe vehicle procurement in Government fleets and recommending additional safety features to be considered.

1.3 Purpose of the Road Crash Report

The purpose of the Annual Road Crash Report is to provide meaningful road crash information aggregated at the Local Government road level. Prior to the production of this report, such road crash information was not easily accessible. It is hoped the information in this report will help to:

- Monitor road safety trends and performance on local roads;
- Raise the profile of Local Government's role in road safety;
- Improve our road safety partners' appreciation and understanding of the task required of Local Governments to deliver road safety outcomes;
- Support the implementation of *Towards Zero* by Local Government;
- Provide evidence and support for advocacy efforts for existing and new programs; and
- Identify areas for more research and action on the local road network such as network planning, works programs, asset management, behavioural interventions, planning and engineering countermeasures.

1.4 Crashes Summarised in the Local Road Crash Report

The emphasis of this Local Road Crash Report is on crashes occurring on roads managed by Local Government. Comparative summaries of crashes on other roads will be provided for comparison where useful.

In this report a local road crash is defined as a crash occurring at:

- a midblock location on a local road; or
- an intersection having no State road legs and at least one Local road leg.

Table 1 summarises all crashes in WA from 2003 to 2012 by crash location and road manager. Note that the road manager for category "Other" includes privately owned or other Government managed roads, such as National Park roads.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	61,877	15.9
Intersection	**State, State**	13,652	3.5
Intersection	**State, LG**	66,465	17.1
Intersection	**State, LG, Other**	404	0.1
Intersection	**State, Other**	546	0.1
Midblock	**LG**	118,084	30.4
Intersection	**LG, LG**	121,003	31.1
Intersection	**LG, Other**	1,611	0.4
Midblock	**Other**	568	0.1
Intersection	**Other, Other**	346	0.1
Other	**Unknown**	4,332	1.1
Total		**388,888**	**100.0**

Table 1: All crashes in WA by location and road manager 2003 to 2012

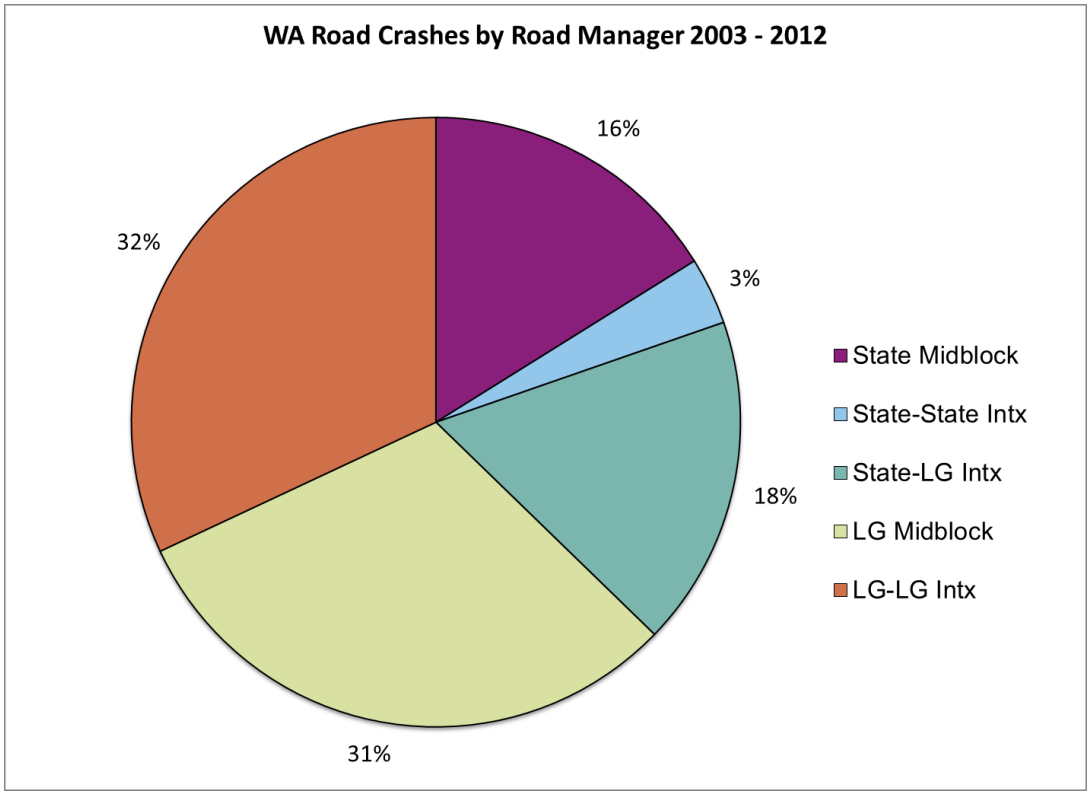

Figure 2: All crashes in WA by crash location and road manager 2003 to 2012

Ignoring crashes at "Other" locations, Figure 2 shows:

- 63% of crashes occurred at local road locations including intersections where all legs were local roads.
- 18% of crashes occurred at intersections having both Local and State road legs.
- 19% of crashes occurred at State road locations including intersections where all legs were State roads.

This report focuses on the 63% of crashes occurring on roads managed by Local Governments.

1.5 Road Safety issues for the South West Region

The road safety issues for the South West Region local road network are:

1. Single vehicle crashes.
2. Serious crashes in 50km/hr. speed zones.
3. Speed and inattention.
4. Over-representation of males in KSI outcomes especially motorcyclists and bicyclists.

2. STATE WIDE LOCAL ROAD CRASH AND KSI SUMMARIES

In this section, statistical summaries of crashes and people killed or seriously injured (KSI) on local roads are provided at the State level to enable a comparison against the regional level. Throughout the report, a *serious crash* is defined as a crash with at least one KSI; therefore, by definition, a serious crash can result in more than one KSI.

2.1 Road Network of Western Australia

Figures 3 and 4 summarise the Western Australian road network by road manager. The Accessibility Remoteness Index of Australia (ARIA) is used to define "Metro", "Rural" and "Remote" roads. The definitions used are consistent with *Towards Zero* regions defined by the Office of Road Safety.

Local roads constitute 88% of the Western Australian road network. The Local and State road networks have similar distributional profiles in terms of accessibility.

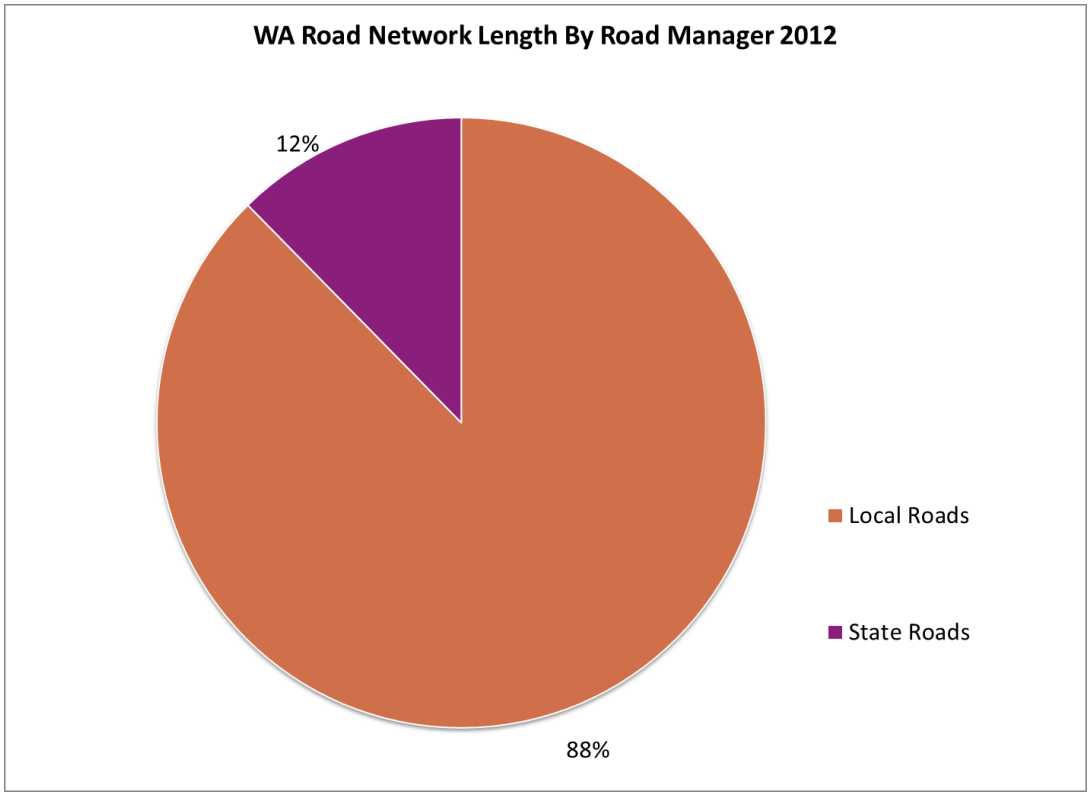

Figure 3: Length of road network in WA by road manager 2012

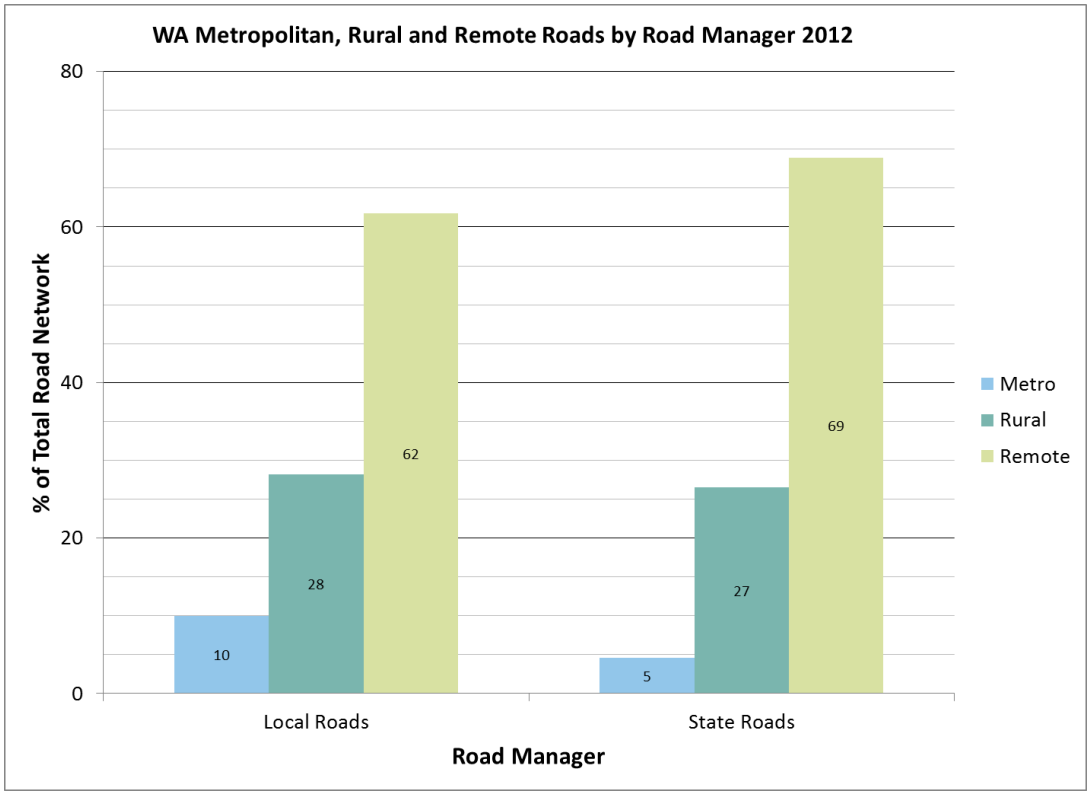

Figure 4: Percentage of road network in WA by road manager and accessibility 2012

2.2 Road Trauma on the Road Network

73% of KSI on local roads occurred in the Metropolitan Region as shown in Figure 5.

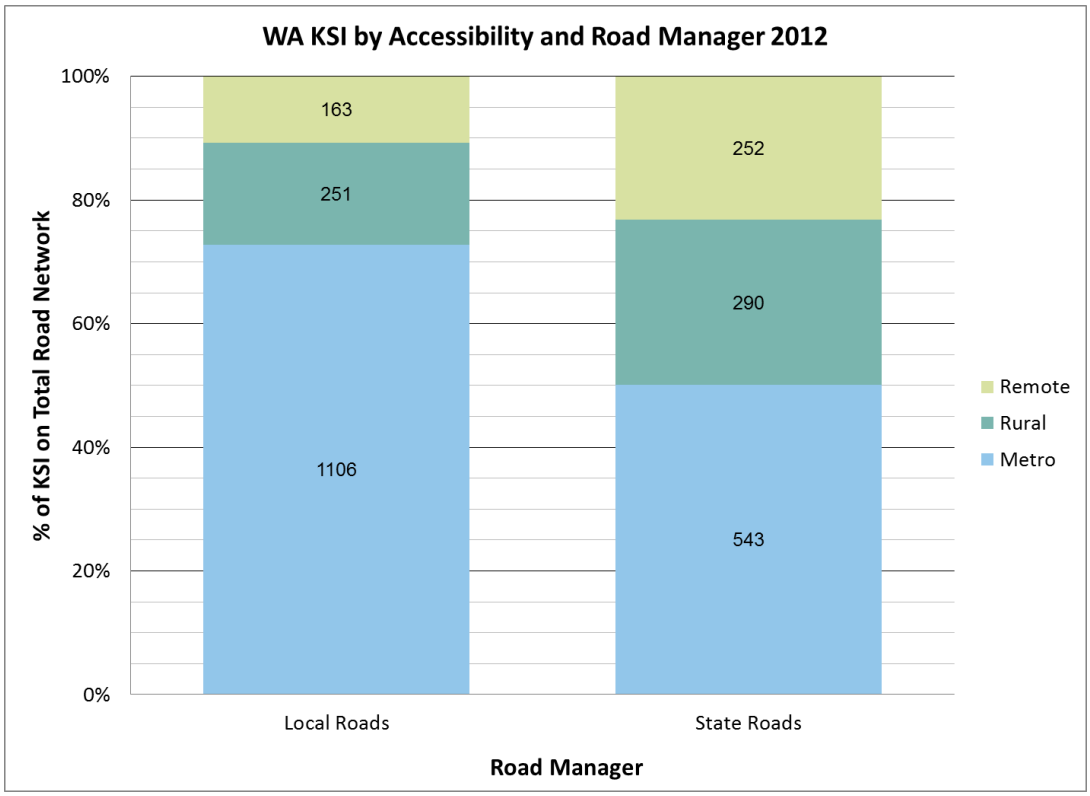

Figure 5: WA KSI by road manager and accessibility 2012

2.3 Crash Rates

Table 2 displays crash rates by road manager; Million Vehicle Kilometres Travelled (MVKT); and population for 2012. For consistency, the MVKT estimates were obtained from Main Roads WA as documented in the *Regional Digest 2011-12* and the population estimates were sourced from the *Main Roads Annual Report 2012*.

Road Manager	MVKT	Population	Serious Crashes			All Other Crashes		
			n	Per 100 MVKT	Per 100,000 Population	n	Per 100 MVKT	Per 100,000 Population
Local	12,898	2,144,000	1,322	10	62	22,472	174	1,048
State	14,602	2,144,000	829	6	39	14,120	97	659
Other		2,144,000	5	n.a.	0	157	n.a.	7
Unknown		2,144,000	32	n.a.	1	219	n.a.	10
Total	**27,500**	**2,144,000**	**2,188**	**8**	**102**	**36,968**	**134**	**1,724**

Table 2: Crash rates by road manager 2012

The number of serious crashes on local roads is over-represented in terms of the travel undertaken on local roads compared to State roads.

Table 3 shows the rate of KSI on local roads by population at a regional level.

The Wheatbelt North, Kimberley, Wheatbelt South and Gascoyne Regions have the highest KSI rates on local roads per population.

Region	KSI Severity			Population	KSI per 100,000 Population
	Killed	Seriously Injured	Total		
Great Southern	3	33	36	59,000	61
South West	9	152	161	233,000	69
Gascoyne	1	9	10	10,000	100
Mid-West	4	29	33	52,000	63
Goldfields-Esperance	3	30	33	55,000	60
Kimberley	3	33	36	34,000	106
Metropolitan	52	1,054	1,106	1,583,000	70
Wheatbelt South	2	22	24	23,000	104
Wheatbelt North	10	45	55	49,000	112
Pilbara	1	25	26	46,000	57
Total	**88**	**1,432**	**1,520**	**2,144,000**	**71**

Table 3: KSI rates per population for local roads 2012

2.4 Trends in KSI

The ten year trend for KSI by road manager is shown in Table 4 and Figure 6.

Year	Road Manager				
	Local Roads	State Roads	Other Roads	Unknown	Total
2003	1,827	1,152	2	73	3,054
2004	1,927	1,368	5	61	3,361
2005	1,924	1,223	2	91	3,240
2006	1,699	1,203	4	59	2,965
2007	1,726	1,234	6	55	3,021
2008	1,718	1,332	7	40	3,097
2009	1,594	1,121	5	39	2,759
2010	1,573	1,110	7	34	2,724
2011	1,507	1,111	5	25	2,648
2012	1,520	1,085	11	39	2,655

Table 4: Trend in KSI by road manager 2003 to 2012

In general, the trend in annual KSI decreases from 2003 for both Local and State roads, but plateaus out from 2009.

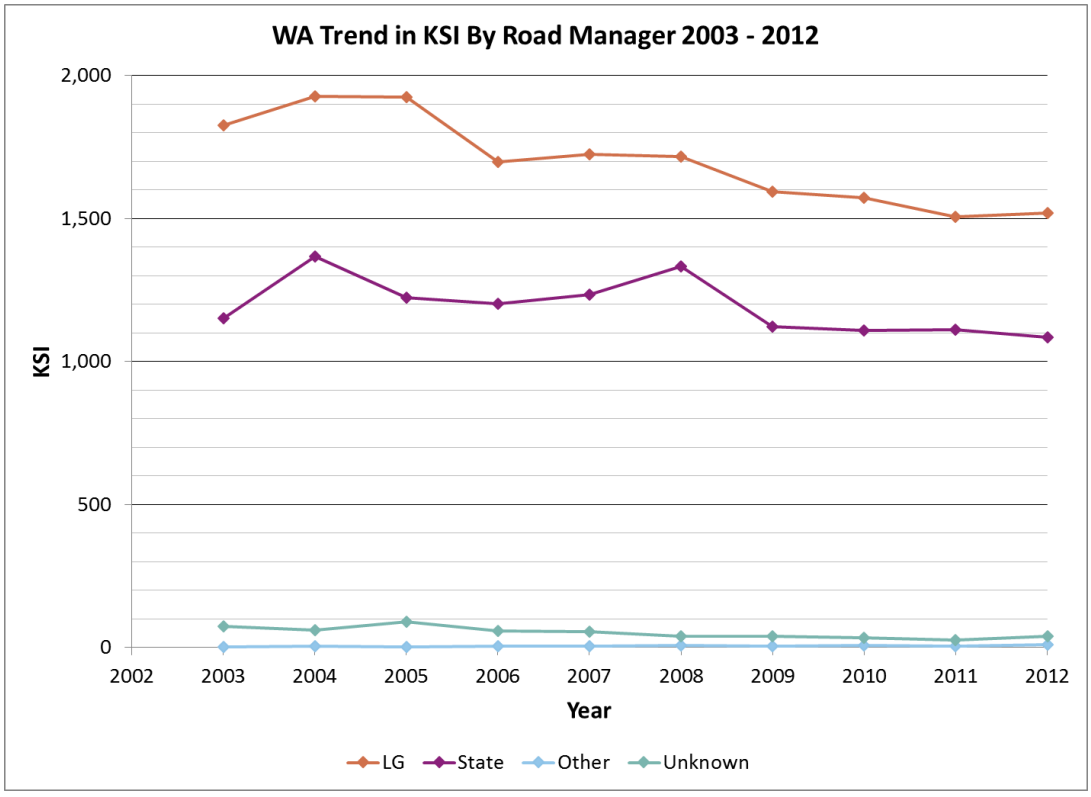

Figure 6: Trend in KSI by road manager 2003 to 2012

2.5 Crashes By Nature

Serious crashes by crash nature from 2003 to 2012 are shown in Figure 7 and 8.

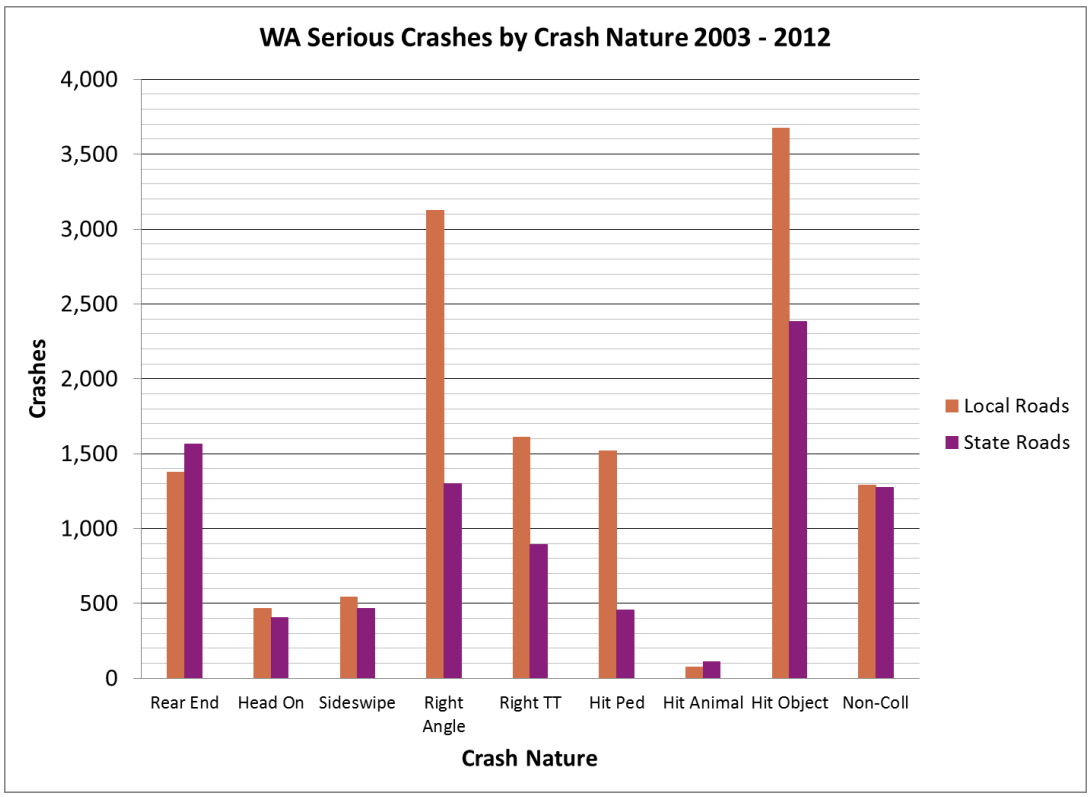

Figure 7: Ten year serious crash totals by crash nature and road manager 2003 to 2012

Hit Object and Right Angle crashes are the most prevalent serious crash nature on local roads; however the trend in these crash natures has decreased from 2003 to 2012 as shown in Figure 8.

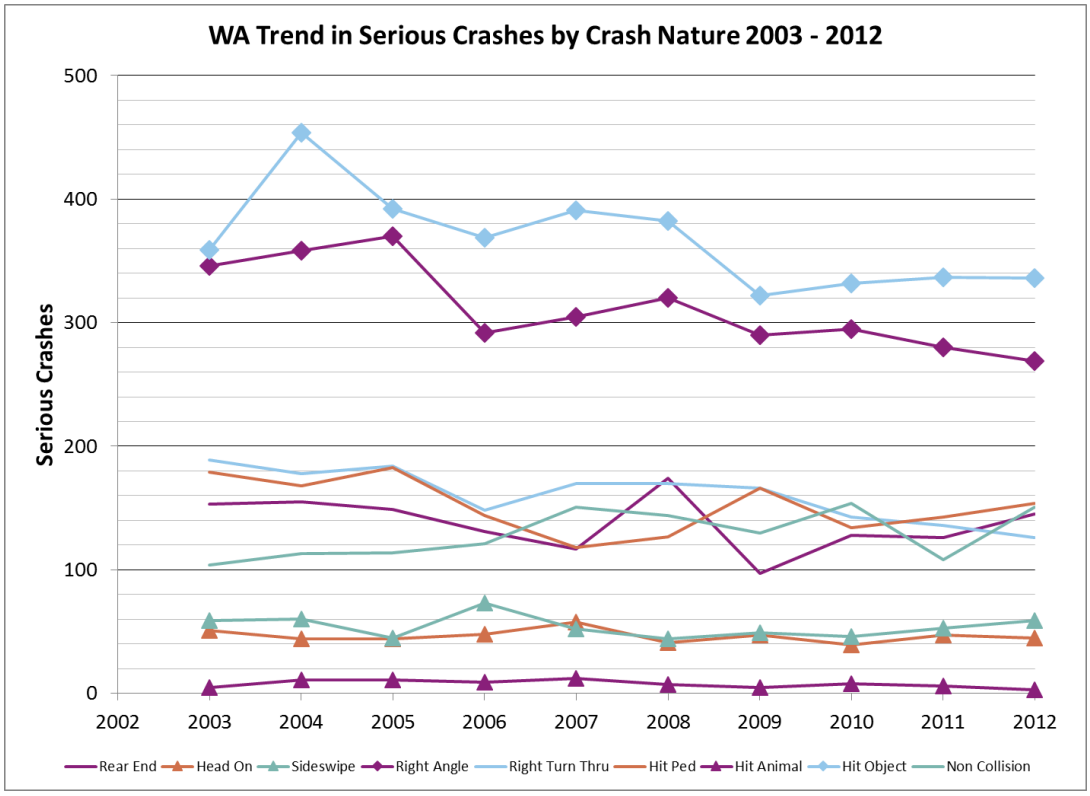

Figure 8: Trend in serious crashes on WA local roads by crash nature 2003 to 2012

Table 5 shows serious crashes by crash nature and region for local roads from 2003 to 2012.

- Single vehicle run-off road crashes and right angle intersection crashes are the dominant crash natures.
- Single vehicle run-off road crashes are the most frequent crash nature for non-metropolitan regions.
- Right angle intersection crashes are the most frequent crash nature for the Metropolitan Region.
- Hit pedestrian crashes are also a high frequency crash nature for all regions.

Region	Crash Nature										
	Rear End	Head On	Side Swipe	Right Angle	Right TT	Hit Ped.	Hit Animal	Hit Obj.	Non Coll.	Run Off Rd	Total
Great Southern	13	14	2	27	7	24	6	7	4	187	301
South West	63	45	40	195	91	114	9	45	26	609	1,269
Gascoyne	2	1	1	2	1	2	2	1	2	45	61
Mid West	15	7	5	43	9	30	4	13	8	147	293
Goldfields - Esperance	12	6	9	52	18	33	4	12	11	180	349
Kimberley	10	5	1	39	14	53	2	8	9	100	248
Wheatbelt South	6	6	3	8	0	3	4	4	5	221	264
Wheatbelt North	13	9	8	22	2	14	10	11	6	353	463
Pilbara	9	5	1	20	7	33	3	7	7	106	206
Rural Total	***143***	***98***	***70***	***408***	***149***	***306***	***44***	***108***	***78***	***1,948***	***3,454***
Metropolitan	1,232	366	470	2,717	1,461	1,210	33	228	185	2,417	10,593
Total	**1,375**	**464**	**540**	**3,125**	**1,610**	**1,516**	**77**	**336**	**263**	**4,365**	**14,047**

Table 5: Serious crashes by crash nature and Region on the local road network 2003 to 2012

Denotes the highest crash frequency, by nature, for a region.

Denotes the second highest crash frequency, by nature, for a region.

Denotes the third highest crash frequency, by nature, for a region.

2.6 KSI by Road User

Figures 9 and 10 show the KSI trend and ten year totals by road user for the local road network in WA.

- The trend in vehicle driver and vehicle passenger KSI has decreased from 2003 to 2012.
- The trend in motorcyclist KSI has increased from 2003 to 2012.
- The trend in bicyclist and pedestrian KSI has remained constant from 2003 to 2012.
- Motorcyclist, bicyclist and pedestrian KSI are significantly higher on local roads than State roads.

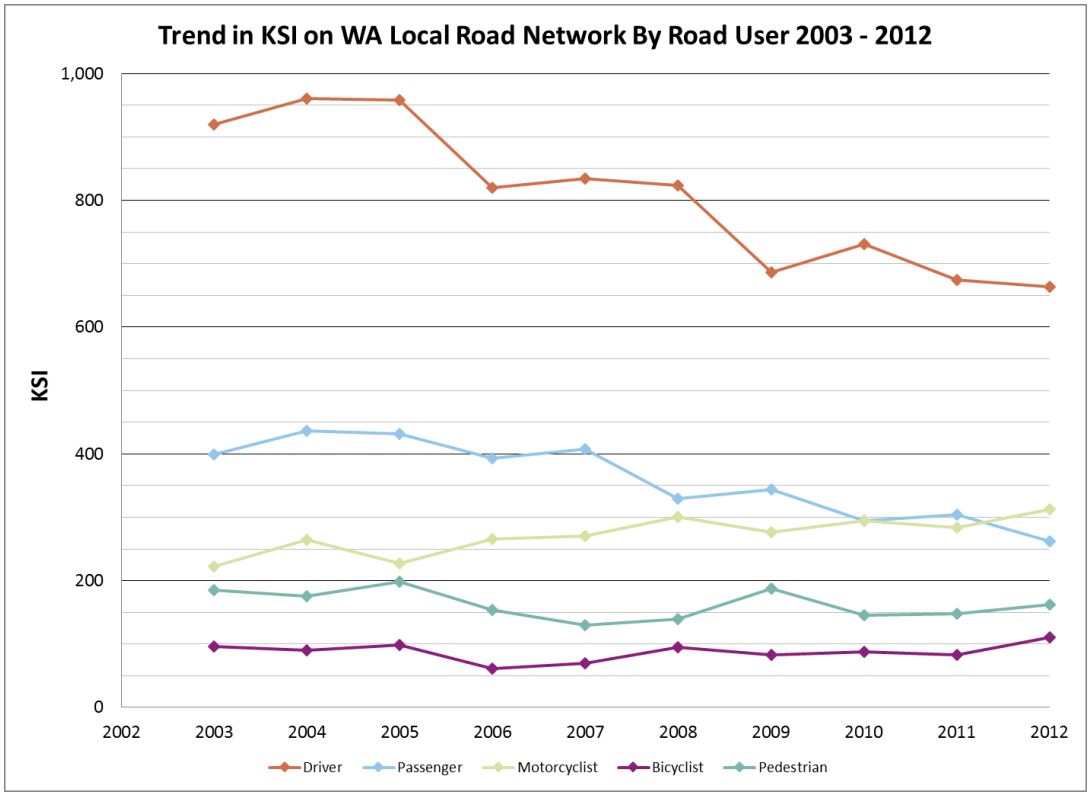

Figure 9: Trend in KSI on WA local roads by road user 2003 to 2012

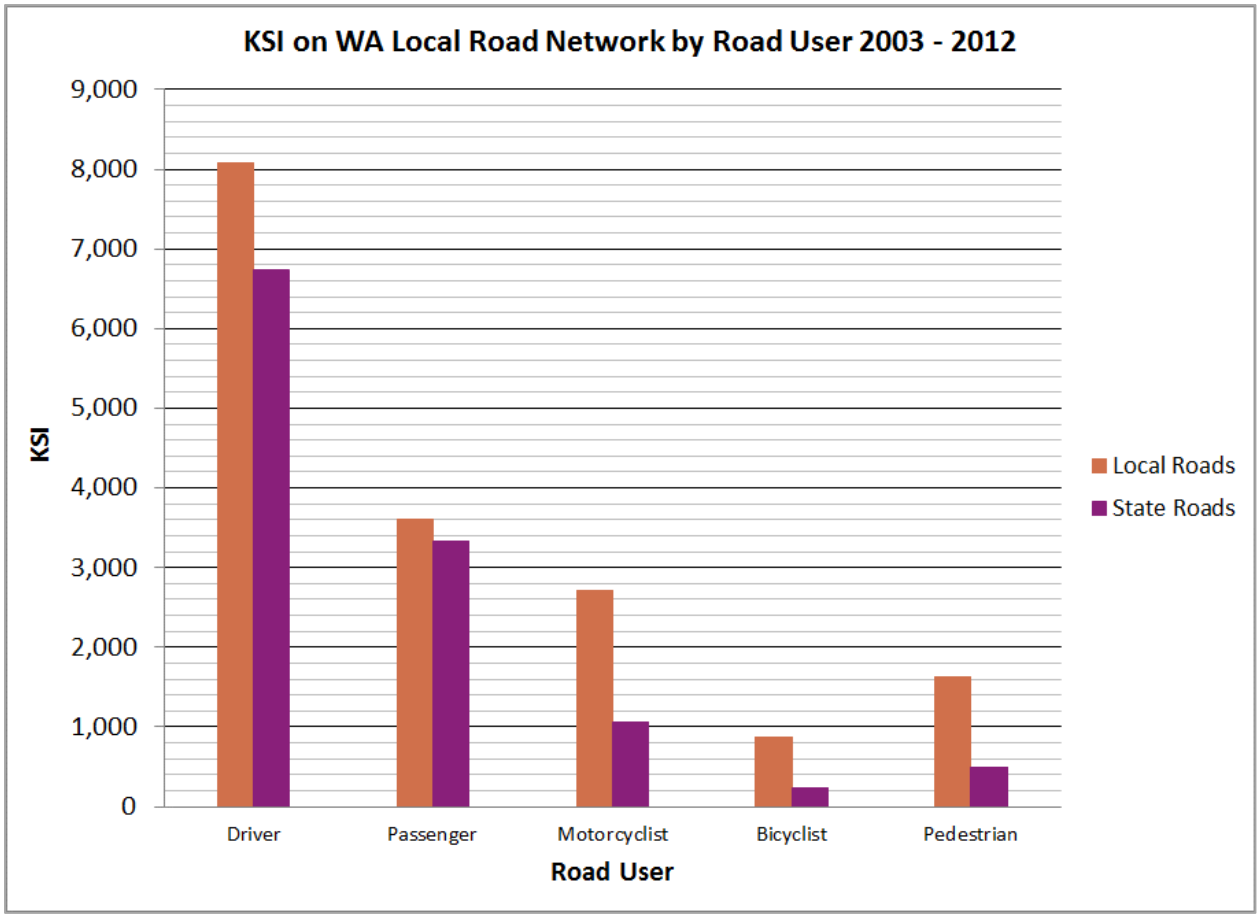

Figure 10: KSI totals by road user 2003 to 2012

2.7 Estimated Cost of Road Crashes in Western Australia

Table 6 shows the estimated cost of crashes on the Western Australian road network for 2012. The unit crash costs in $2012 were provided by the Office of Road Safety and are based upon the Willingness-to-Pay unit costs from the RTA NSW report entitled "*Economic Valuation of Safety Benefits: Serious injuries - Final Report*".

Crash Severity	Cost Per Crash	Local Roads		State Roads		WA
		Crashes	Cost	Crashes	Cost	Total Cost
	$	n	$	n	$	$
Metropolitan						
Fatal	6,898,492	51	352M	24	166M	559M
Hospitalisation	292,766	936	274M	424	124M	401M
Medical	74,991	2,583	194M	1,872	140M	336M
PDO	11,330	16,873	191M	10,013	113M	308M
Metropolitan Total		***20,443***	***1,011M***	***12,333***	***544M***	***1,604M***
Rural						
Fatal	7,969,955	36	287M	50	398M	717M
Hospitalisation	467,526	299	140M	331	155M	302M
Medical	103,480	366	38M	372	38M	78M
PDO	11,330	2,650	30M	1,863	21M	52M
Rural Total		***3,351***	***495M***	***2,616***	***613M***	***1,149M***
Total		**23,794**	**1,505M**	**14,949**	**1,156M**	**2,753M**

Table 6: Estimated cost of all crashes in WA by road manager 2012

The cost of crashes on the local road network in 2012 was $1.5B (Figure 11), two-thirds of which was accrued in the Metropolitan Region. For State roads, the crash cost accrued in the Metropolitan Region is half the total State road crash cost (Figure 12). Table 7 and Figure 13 show the distribution of crash costs from 2003 to 2012.

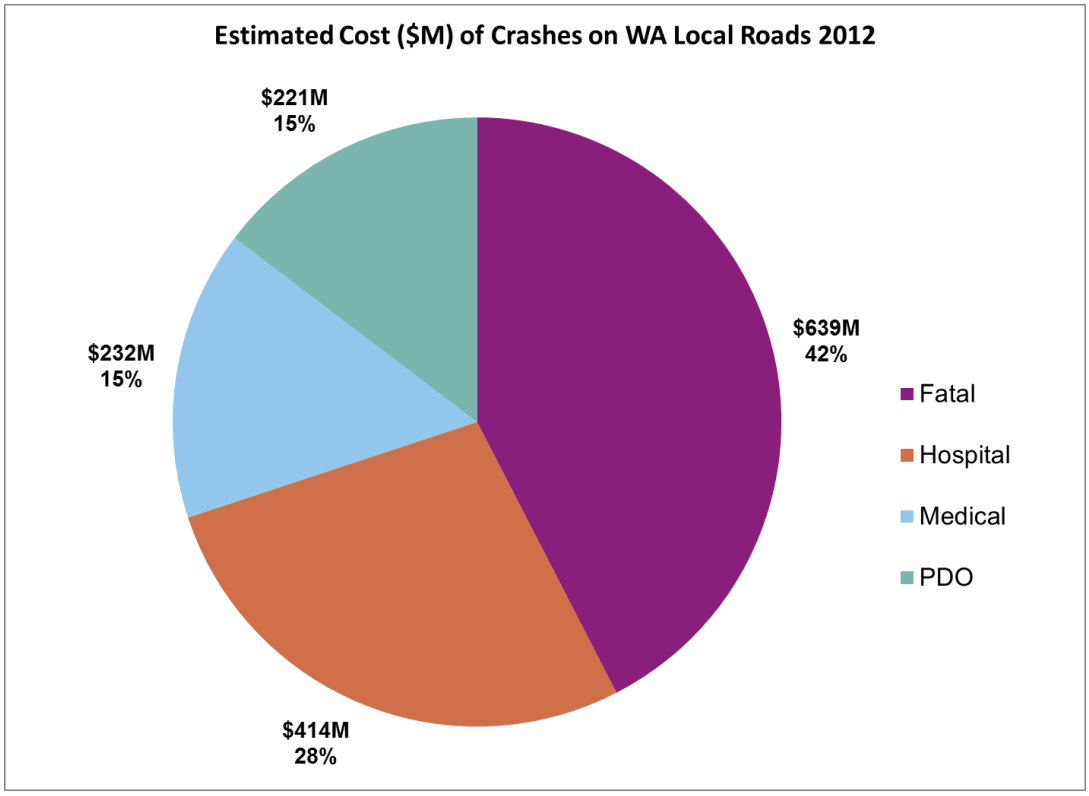

Figure 11: Estimated cost of all crashes on local roads 2012

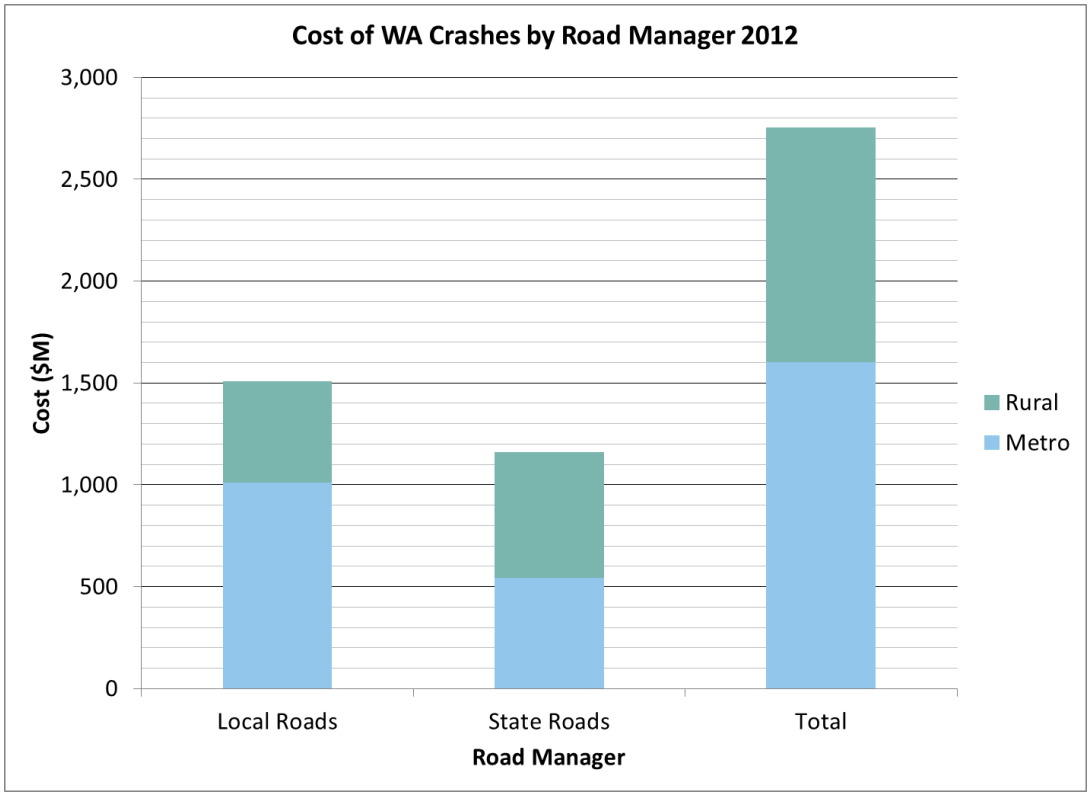

Figure 12: Estimated cost of all crashes in WA by road manager 2012

Crash Severity	Cost Per Crash	Local Roads		State Roads		WA
		Crashes	Cost	Crashes	Cost	Total Cost
	$	n	$	n	$	$
Metropolitan						
Fatal	6,898,492	462	3,187M	271	1,869M	5,195M
Hospitalisation	292,766	10,131	2,966M	4,963	1,453M	4,465M
Medical	74,991	27,285	2,046M	18,456	1,384M	3,458M
PDO	11,330	166,118	1,882M	92,262	1,045M	2,959M
Metropolitan Total		***203,996***	***10,081M***	***115,952***	***5,752M***	***16,077M***
Rural						
Fatal	7,969,955	367	2,925M	576	4,591M	7,842M
Hospitalisation	467,526	3,087	1,443M	3,202	1,497M	3,040M
Medical	103,480	4,256	440M	3,685	381M	847M
PDO	11,330	28,993	328M	19,529	221M	565M
Rural Total		***36,703***	***5,137M***	***26,992***	***6,690M***	***12,295M***
Total		**240,699**	**15,219M**	**142,944**	**12,442M**	**28,372M**

Table 7: Cost of all crashes in WA by road manager 2003 to 2012

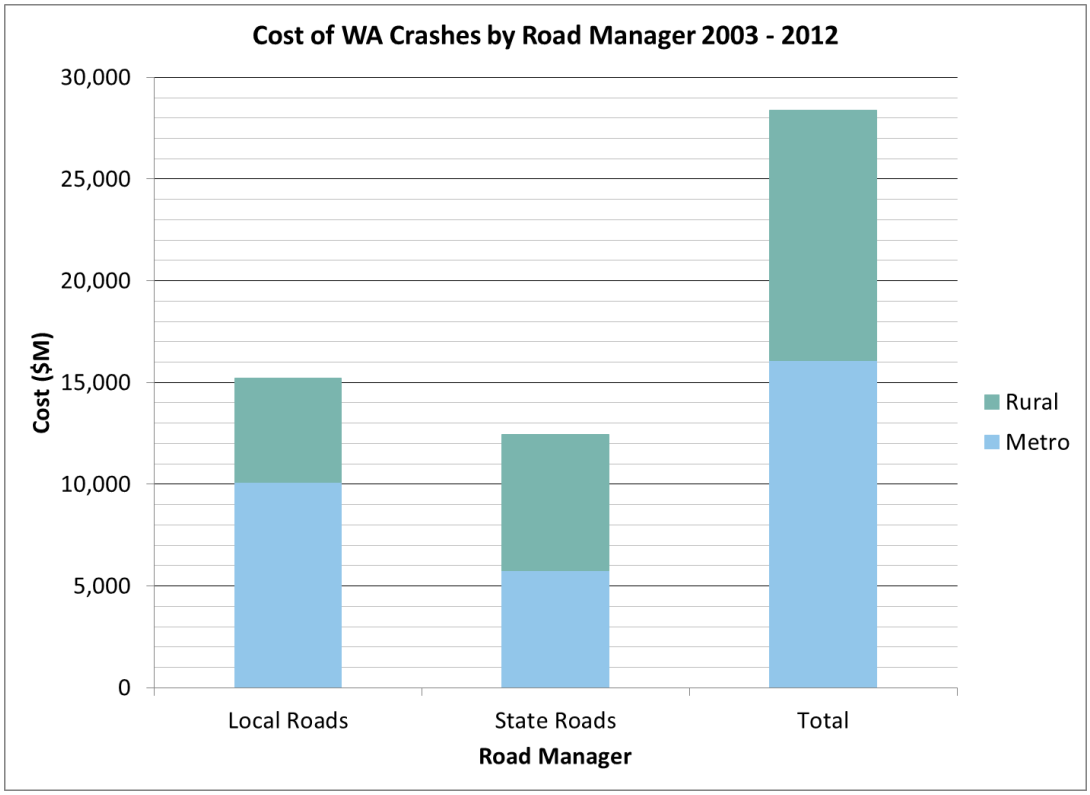

Figure 13: Cost of all crashes in WA by road manager 2003 to 2012

3. REGIONAL ROAD CRASH AND KSI SUMMARIES

In this section road crash and KSI summaries are provided for the South West Region local road network.

3.1 South West Region Road Network

Figures 14 and 15 illustrate the road network in the South West Region by road manager. The Accessibility Remoteness Index of Australia (ARIA) is used to define “Metro”, “Rural” and “Remote” roads. The definitions used are consisted with *Towards Zero* regions defined by the Office of Road Safety.

Local roads constitute 86% of the South West Region road network. The local road network has an 88% rural and 12% remote split in terms of accessibility compared to an 84% rural and 16% remote split for State roads.

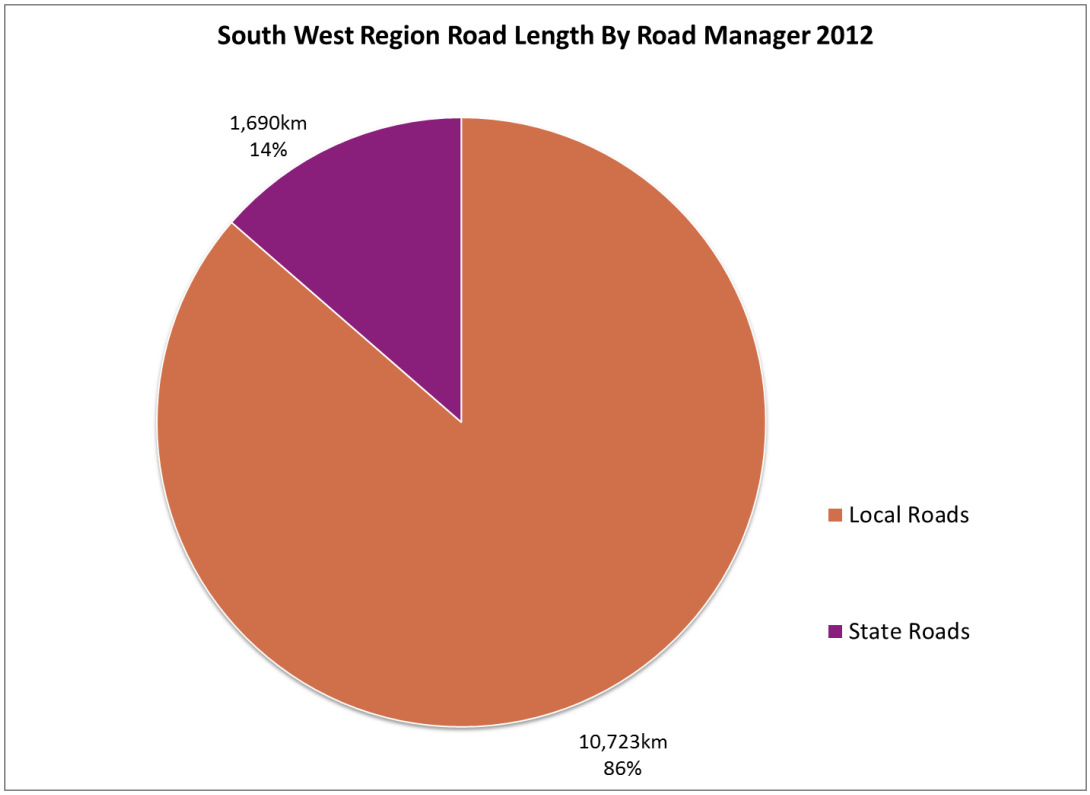

Figure 14: Length of road network in South West Region by road manager 2012

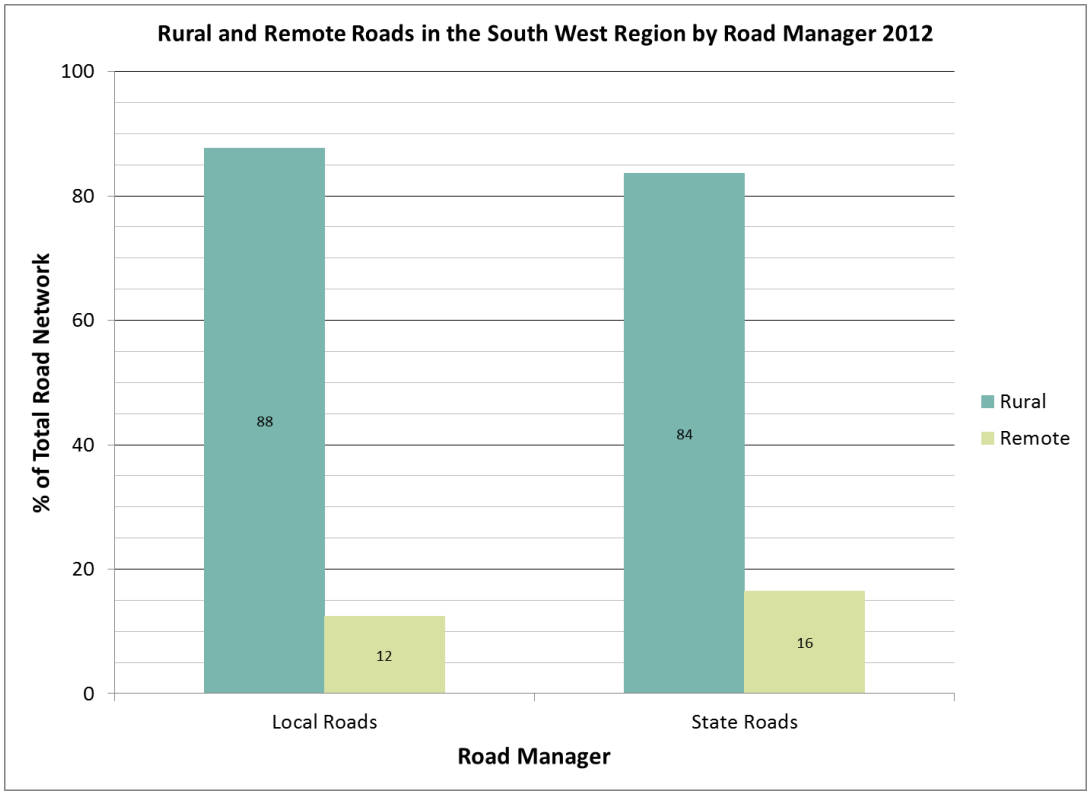

Figure 15: Percentage of road network and accessibility 2012

3.2 Crashes by Location and Road Manager

Table 8 shows all crashes by crash location and road manager in the South West Region from 2003 to 2012. Note that the road manager of category "Other" includes privately owned or other Government managed roads, such as National Park roads.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	5,940	20.0
Intersection	**State, State**	1,332	4.5
Intersection	**State, LG**	5,057	17.1
Intersection	**State, LG, Other**	5	0.0
Intersection	**State, Other**	23	0.1
Midblock	**LG**	9,855	33.3
Intersection	**LG, LG**	6,811	23.0
Intersection	**LG, Other**	25	0.1
Midblock	**Other**	30	0.1
Intersection	**Other, Other**	2	0.0
Other	**Unknown**	551	1.9
Total		**29,631**	**100.0**

Table 8: Crashes by crash location and road manager 2003 - 2012

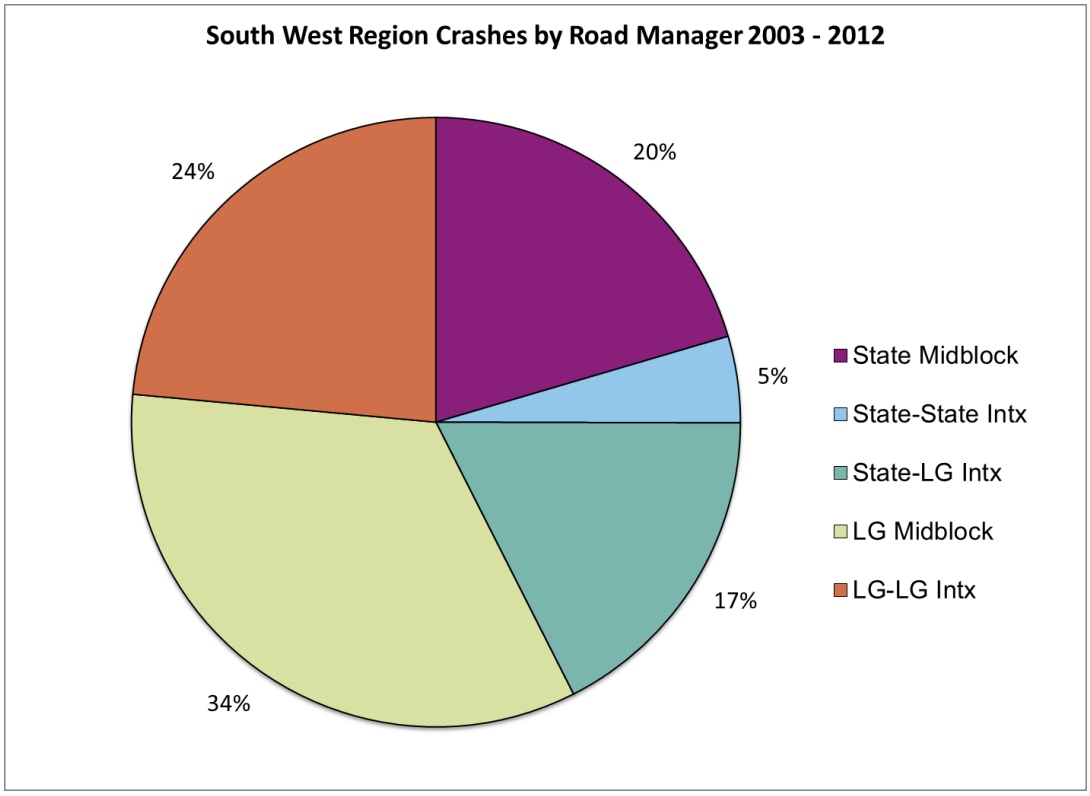

Figure 16: Crashes by crash location and road manager 2003 - 2012

Ignoring crashes at “Other” locations, Figure 16 shows:

- 58% of crashes occurred at local road locations including intersections where all legs were local roads.
- 17% of crashes occurred at intersections having both Local and State road legs.
- 25% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 16 also shows that 54% of crashes in the South West Region occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

3.3 KSI Trend by Local Government

Table 9 shows the KSI trend by Local Government for the South West Region local road network. Figure 17 displays the total trend across all Local Governments.

Local Government	Year										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Augusta - Margaret River	11	9	10	5	8	15	2	1	20	0	81
Boddington	1	1	2	1	3	4	1	1	3	1	18
Boyup Brook	0	0	2	2	4	2	3	4	1	1	19
Bridgetown - Greenbushes	5	4	0	2	3	9	2	1	2	0	28
Bunbury (C)	37	24	23	37	28	38	23	32	28	23	293
Busselton (C)	19	18	18	24	13	18	14	22	16	20	182
Capel	1	1	8	4	1	5	3	7	4	8	42
Collie	7	2	5	2	10	9	2	8	4	6	55
Dardanup	6	17	6	4	3	4	3	9	7	16	75
Donnybrook - Balingup	0	2	6	0	0	4	9	7	3	5	36
Harvey	8	17	12	19	5	22	11	14	6	22	136
Mandurah (C)	25	26	32	36	43	34	19	38	47	33	333
Manjimup	10	2	12	18	3	7	15	13	3	7	90
Murray	11	10	11	10	20	16	11	13	3	9	114
Nannup	5	1	2	5	1	1	2	1	3	5	26
Waroona	1	2	3	7	4	5	4	3	1	5	35
TOTAL	**147**	**136**	**152**	**176**	**149**	**193**	**124**	**174**	**151**	**161**	**1,563**

Table 9: KSI trend by Local Government 2003 - 2012

The City of Mandurah, City of Bunbury and City of Busselton experienced the highest frequency of KSI from 2003 to 2012.

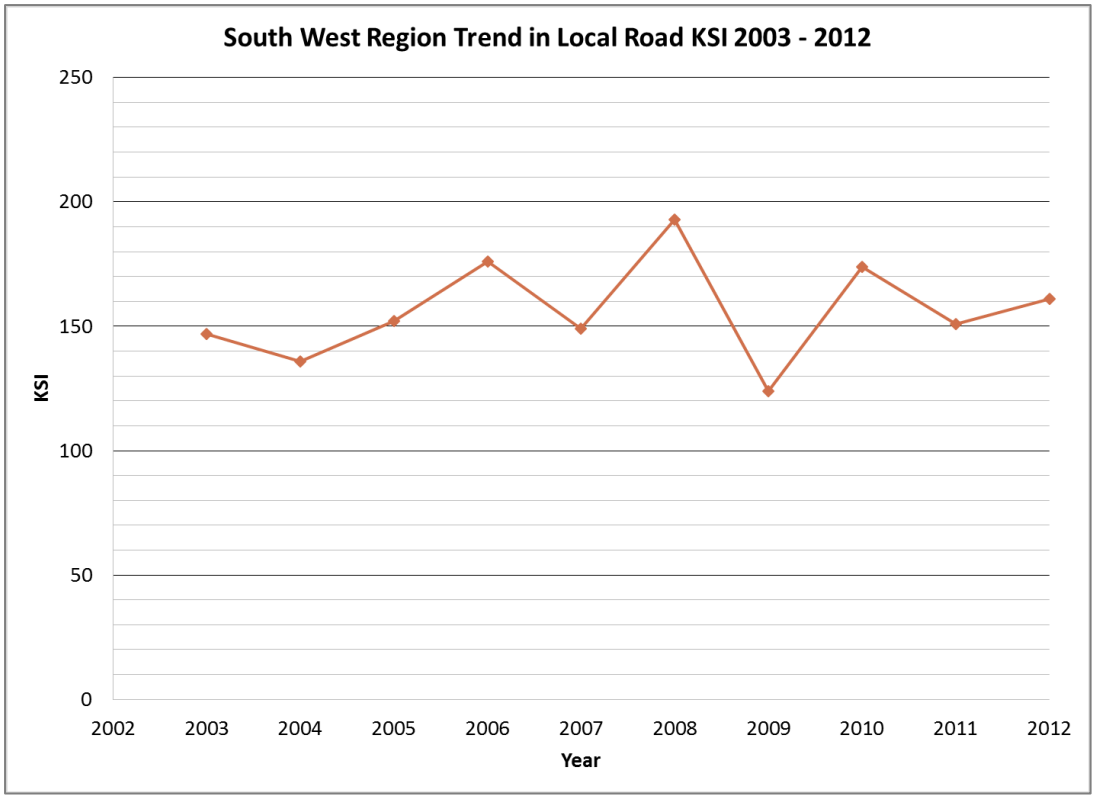

Figure 17: KSI trend for the South West Region 2003 – 2012

3.4 Crash Severity

Table 10 shows all crashes by crash severity for the South West Region local road network for 2012.

Crash Severity	Region		
	South West (SW)	State	% for SW
	n	n	%
Fatal	9	87	10.3
Hospitalisation	120	1,235	9.7
Medical	180	2,949	6.1
PDO Major	833	12,106	6.9
PDO Minor	425	7,417	5.7
Total	**1,567**	**23,794**	**6.6**

Table 10: All crashes on local roads by crash severity 2012

3.5 Road Surface Type

5% of crashes occurred on unsealed roads on the South West Region local road network.

Crash Severity	Surface Type						
	Sealed		Unsealed		Unknown		Total
	n	%	n	%	n	%	n
Fatal	9	100.0	0	0.0	0	0.0	9
Hospitalisation	108	90.0	12	10.0	0	0.0	120
Medical	171	95.0	8	4.4	1	0.6	180
PDO Major	770	92.4	52	6.2	11	1.3	833
PDO Minor	407	95.8	9	2.1	9	2.1	425
Total	**1,465**	**93.5**	**81**	**5.2**	**21**	**1.3**	**1,567**

Table 11: All crashes on local roads by surface type and crash severity 2012

3.6 Crash Nature

Table 12 shows KSI by crash nature for the South West Region local road network for 2012.

Crash Nature	Region		
	South West (SW)	State	% for SW
	n	n	%
Multi-Vehicle Crashes			
Rear End	10	163	6.1
Head On	3	57	5.3
Sideswipe	4	60	6.7
Right Angle	23	315	7.3
Right Turn Thru	6	149	4.0
Multi-Vehicle Other	6	19	31.6
Multi-Vehicle Total	***52***	***763***	***6.8***
Single Vehicle Crashes			
Hit Pedestrian	11	159	6.9
Hit Animal	0	3	0.0
Hit Object	71	394	18.0
Non-Collision	24	181	13.3
Single Vehicle Other	3	20	15.0
Single Vehicle Total	***109***	***757***	***14.4***
Total	**161**	**1,520**	**10.6**

Table 12: KSI on Local roads by crash nature 2012

Over 59% of KSI on the South West local road network occurred in single vehicle crashes of Hit Object and Non-Collision.

3.7 Vehicle Type

Table 13 and Figure 18 show KSI by vehicle type and road manager for the South West Region local road network for 2012.

Vehicle Type	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Car	56	80	0	1	137
Station Wagon	28	28	0	0	56
Utility	14	9	0	0	23
Panel Van	5	4	0	0	9
Truck	1	4	0	0	5
Prime Mover	0	0	0	0	0
Bus	0	0	0	0	0
Motorcycle	28	16	0	1	45
Multi-Seated Van	0	2	0	0	2
Truck Combination	1	4	0	0	5
4WD	7	11	0	0	18
Other	2	1	0	0	3
Total	**142**	**159**	**0**	**2**	**303**

Table 13: KSI by vehicle type and road manager 2012

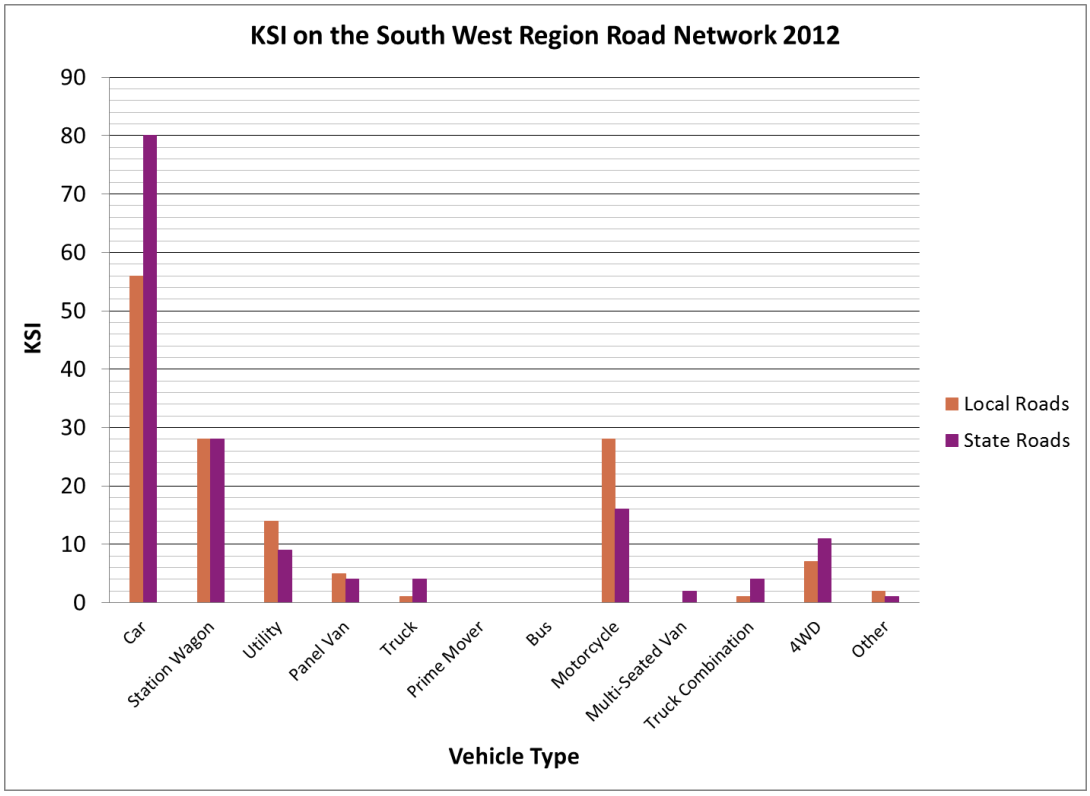

Figure 18: KSI by vehicle type and road manager 2012

3.8 Road User

Table 14 and Figure 19 show KSI by road user and road manager for the South West Region local road network for 2012.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	73	96	0	1	170
Passenger	39	47	0	0	86
Motorcyclist	28	16	0	1	45
Bicyclist	7	5	0	0	12
Pedestrian	12	5	0	0	17
Other	2	0	0	0	2
Total	**161**	**169**	**0**	**2**	**332**

Table 14: KSI by road user and road manager 2012

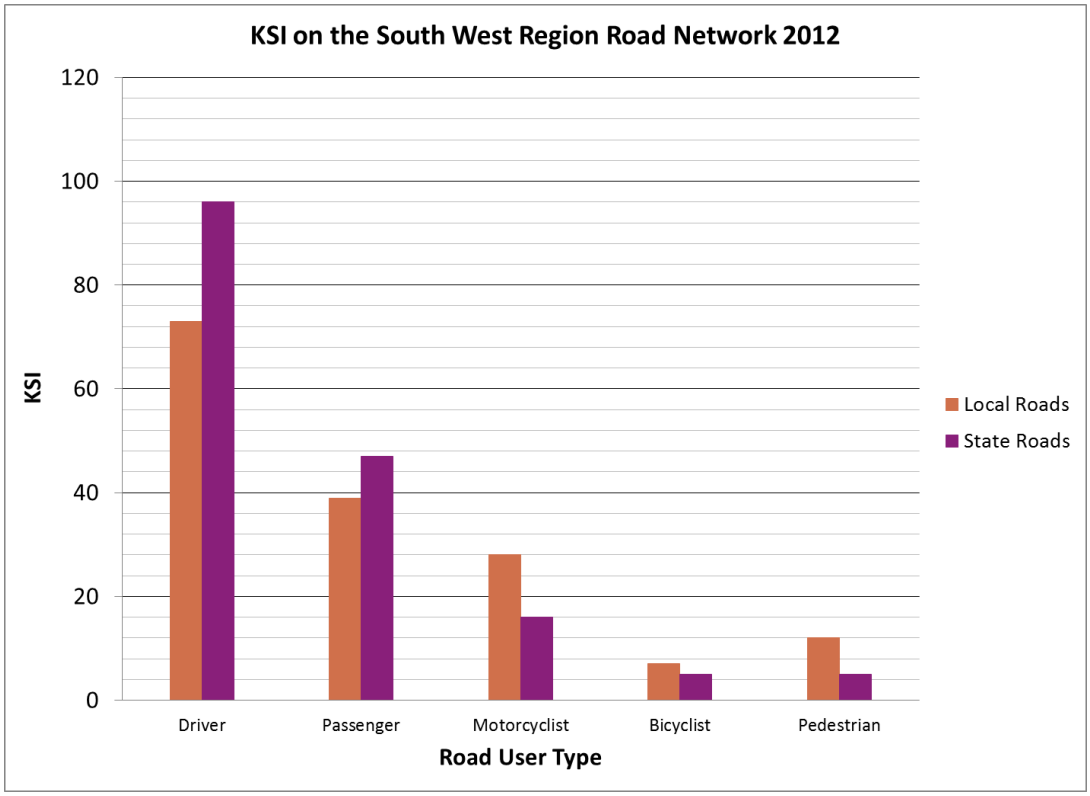

Figure 19: KSI by road user and road manager 2012

3.9 Speed

Figure 20 shows KSI where speed was considered a factor for the South West Region local road network. The determination of whether speed was a factor in a crash can only be reliably determined from police attended crashes.

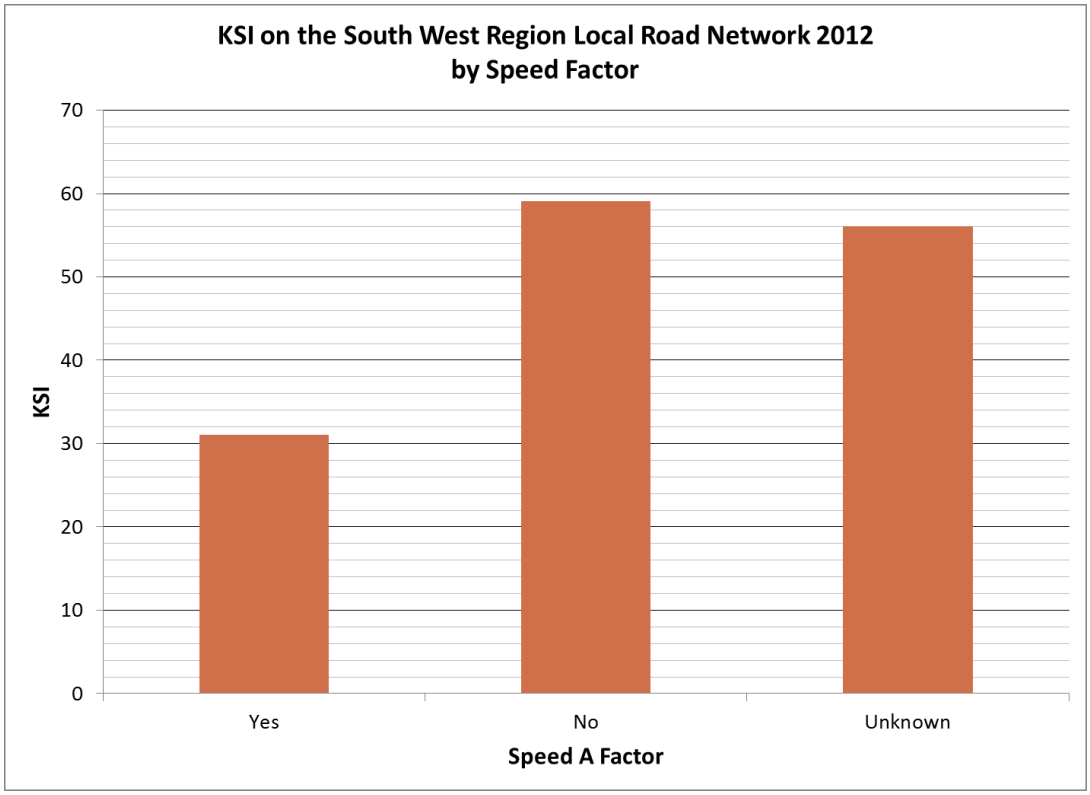

Figure 20: KSI by speed factor 2012 (police attended)

3.10 Blood Alcohol Content (BAC)

Table 15 and Figure 21 show KSI by the highest BAC reading for a driver/rider for the South West Region local road network. The subset of police attended crashes was used in the summaries below.

Highest Driver/Rider BAC in Police Attended Crash	KSI Severity					
	Killed		Seriously Injured		Total	
	n	%	n	%	n	%
Nil	7	78	81	59	88	60
0 ≤ BAC < 0.05	1	11	2	1	3	2
0.05 ≤ BAC ≤ 0.08	0	0	4	3	4	3
0.08 ≤ BAC < 0.15	0	0	4	3	4	3
BAC ≥ 0.15	0	0	7	5	7	5
Subtotal BAC ≥ 0.05	***0***	***0***	***15***	***11***	***15***	***10***
Unknown	1	11	39	28	40	27
Total KSI	**9**	**100**	**137**	**100**	**146**	**100**

Table 15: KSI by highest BAC reading in the crash 2012

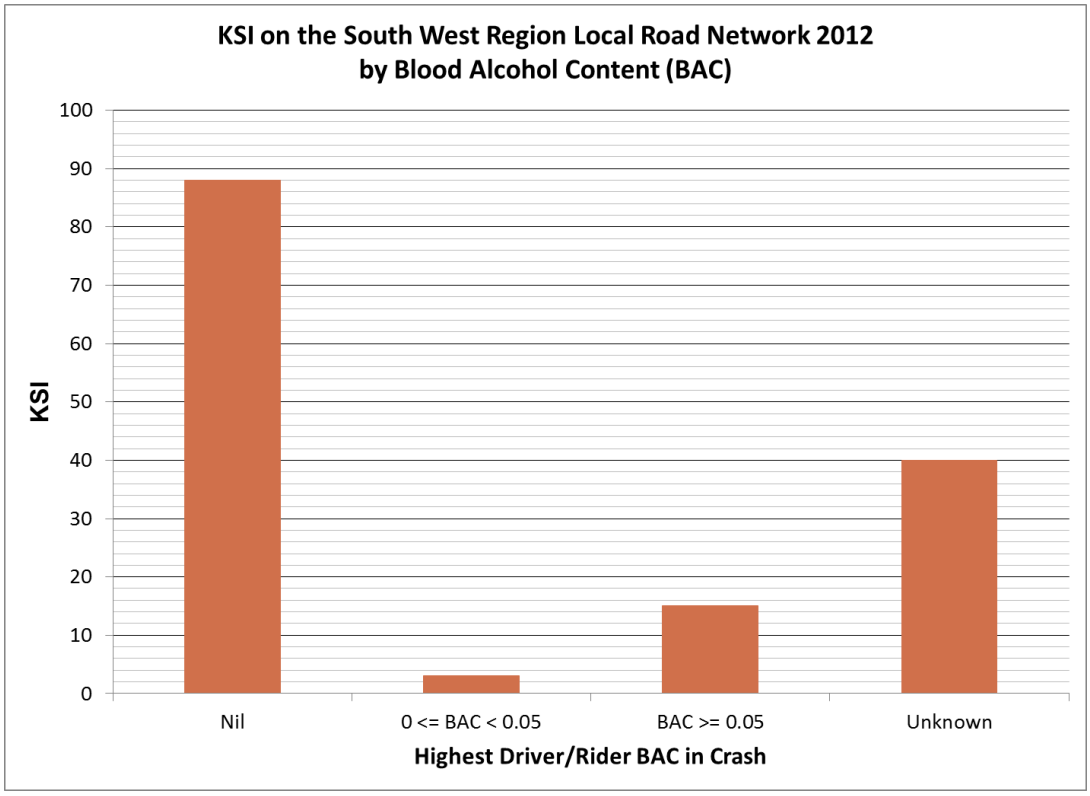

Figure 21: KSI by highest BAC reading in the crash 2012 (police attended)

3.11 Seatbelt Use

Figure 22 shows KSI by seatbelt usage for the South West Region local road network. The subset of police attended crashes was used in the figure below.

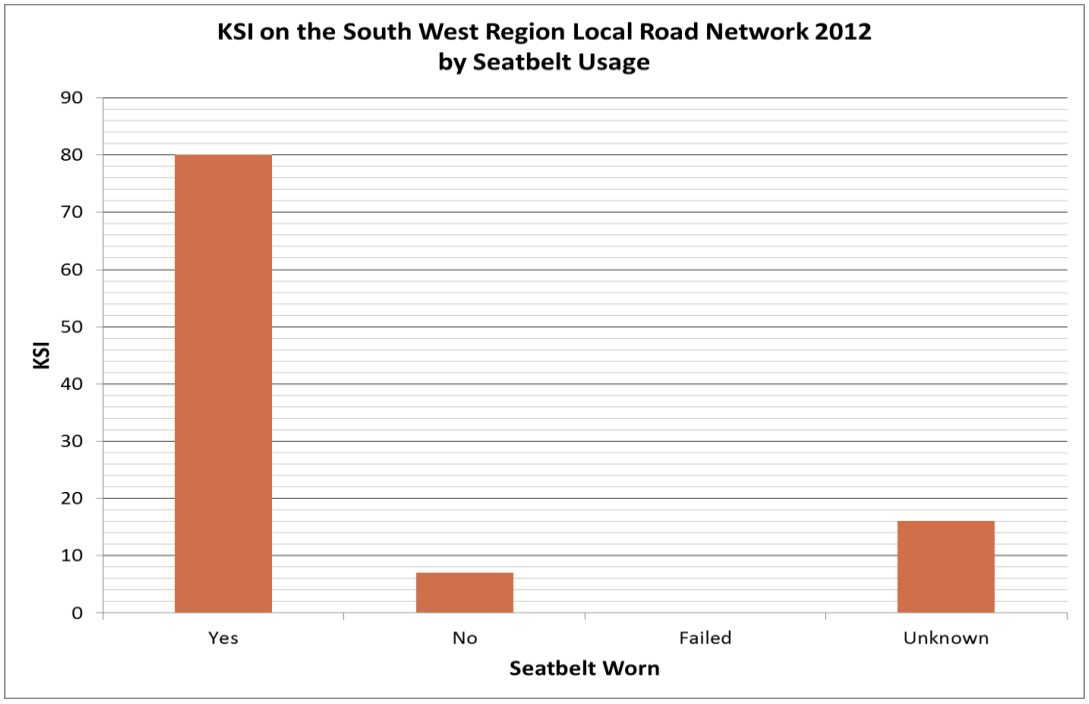

Figure 22: KSI by seatbelt usage 2012 (police attended)

4. SAFE SYSTEM

In this section, KSI summaries are provided for the South West Region Local road network for the four cornerstones of *Towards Zero* – Safe Roads and Roadsides, Safe Speeds, Safe Road Use, and Safe Vehicles.

4.1 Safe Roads and Roadsides

Table 16 shows KSI in single vehicle run-off crashes on the South West Region local road network from 2003 to 2012. Run-off road crashes are a road safety issue for both Local and State road managers.

Road Manager	KSI in Run-off Road Crashes	
	n	%
Local	762	47.6
State	802	50.1
Other	4	0.2
Unknown	33	2.1
Total	**1,601**	**100**

Table 16: KSI in run-off road crashes 2003 to 2012

4.2 Safe Speeds

Table 17 and Figure 23 show KSI by speed zone on the South West Region local road network where speed was a factor from 2003 to 2012. The analysis was restricted to police attended crashes for consistency.

Speed Zone (km/hr.)	KSI Severity		
	Killed	Seriously Injured	KSI Total
	n	n	n
< 50	0	2	2
50	8	88	96
60	4	50	54
70	1	10	11
80	2	17	19
90	5	21	26
100	1	2	3
110	12	54	66
Unknown	3	49	52
Total	**36**	**293**	**329**

Table 17: KSI by speed zone 2003 to 2012 (police Attended)

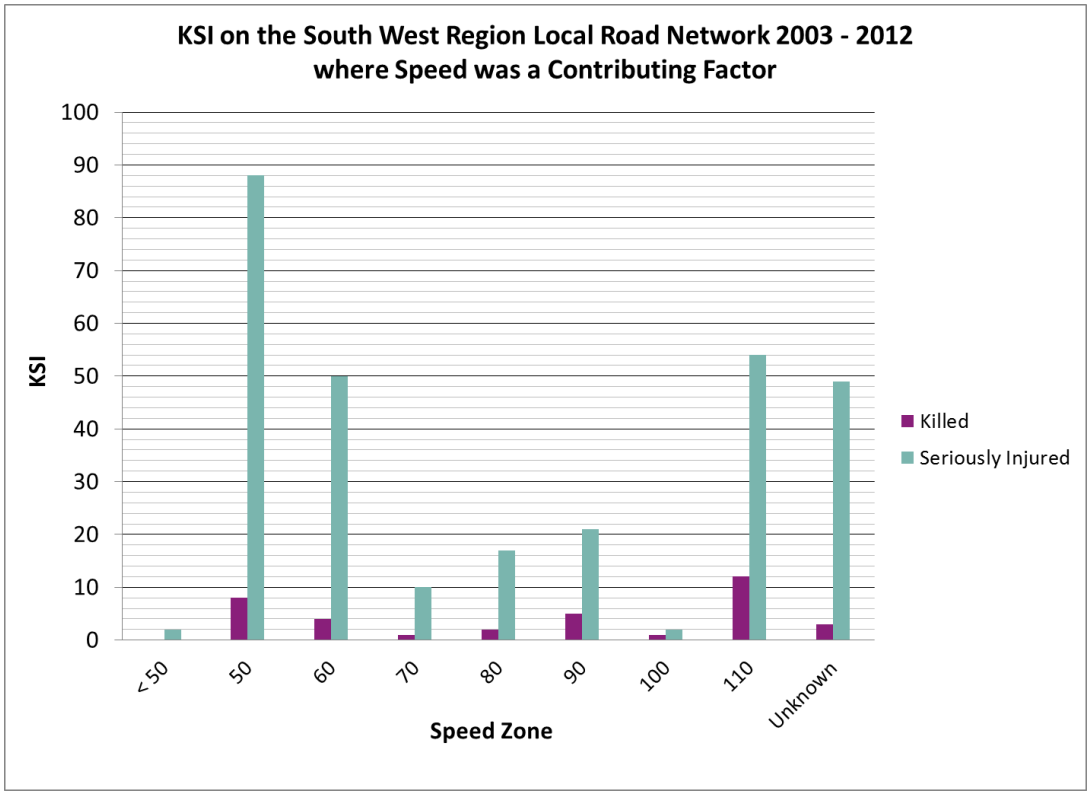

Figure 23: KSI by speed zone 2003 to 2012 (police attended)

Road segments with a speed limit of 50km/hr. had the highest number of KSI followed by road segments with a speed limit of 110km/hr.

4.3 Safe Road Use

Table 18 identifies the contributing factors to KSI on the South West Region local road network. The analysis is restricted to police attended crashes for consistency. The contributing factors are not necessarily mutually exclusive – a crash might have more than one contributing factor.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	290	425	2	5	722
Seatbelts Not Worn	113	94	0	6	213
Alcohol	215	153	0	10	378
Speed	329	196	0	8	533

Table 18: KSI by contributing factor 2003 to 2012 (police Attended)

Speed and inattention are the dominant contributing factors in serious crashes on the South West Region local road network.

4.4 Safe Vehicles

Table 19 shows KSI by vehicle type and road manager on the South West local road network for 2003 to 2012.

Vehicle Type	Road Manager								
	Local		State		Other		Unknown		Total
	n	Row %	n	Row %	n	Row %	n	Row %	n
Car	702	41.6	965	57.2	2	0.1	19	1.1	1,688
Station Wagon	144	40.3	205	57.4	3	0.8	5	1.4	357
Utility	170	46.8	184	50.7	1	0.3	8	2.2	363
Panel Van	27	31.0	60	69.0	0	0.0	0	0.0	87
Truck	9	22.0	32	78.0	0	0.0	0	0.0	41
Prime Mover	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0
Bus	3	6.7	42	93.3	0	0.0	0	0.0	45
Motorcycle	244	59.5	145	35.4	0	0.0	21	5.1	410
Multi-Seated Van	9	42.9	12	57.1	0	0.0	0	0.0	21
Truck Combination	10	33.3	20	66.7	0	0.0	0	0.0	30
4WD	57	35.6	98	61.3	0	0.0	5	3.1	160
Other	18	52.9	16	47.1	0	0.0	0	0.0	34
Total	**1,393**	**43.0**	**1,779**	**55.0**	**6**	**0.2**	**58**	**1.8**	**3,236**

Table 19: KSI by vehicle type 2003 to 2012

5. DEMOGRAPHICS

In this section demographic summaries of KSI are provided for the South West Region local road network.

5.1 Gender

Table 20 shows the gender breakdown of KSI on the South West Region local road network from 2003 to 2012.

Road User	Gender	KSI Severity		
		Killed	Seriously Inj.	Total
		n	n	n
Driver	Female	10	274	284
	Male	31	422	453
	Unknown	0	1	1
	Total	***41***	***697***	***738***
Passenger	Female	9	97	106
	Male	16	135	151
	Unknown	0	136	136
	Total	***25***	***368***	***393***
Motorcyclist	Female	3	22	25
	Male	24	190	214
	Unknown	0	5	5
	Total	***27***	***217***	***244***
Bicyclist	Female	0	4	4
	Male	2	46	48
	Unknown	0	0	0
	Total	***2***	***50***	***52***
Pedestrian	Female	2	39	41
	Male	6	70	76
	Unknown	0	1	1
	Total	***8***	***110***	***118***
Other	Female	0	3	3
	Male	0	8	8
	Unknown	0	7	7
	Total	***0***	***18***	***18***
Total	Female	24	439	463
	Male	79	871	950
	Unknown	0	150	150
	Total	**103**	**1,460**	**1,563**

Table 20: KSI by road user and gender for 2003 to 2012

Males constitute 60% of all people KSI in crashes. Males constitute 88% of motorcyclists KSI and 92% of bicyclists KSI.

5.2 Age

Table 21 and Figure 24 show KSI by age and road manager for the South West Region local road network from 2003 to 2012.

Age	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
0 to 11	56	68	0	0	124
12 to 16	97	83	1	3	184
17 to 20	328	276	2	6	612
21 to 24	176	161	0	9	346
25 to 29	149	145	2	8	304
30 to 39	206	260	0	17	483
40 to 49	178	252	0	7	437
50 to 59	125	208	0	5	338
60 to 69	75	122	0	4	201
70+	106	176	0	1	283
Unknown	67	109	1	1	178
Total	**1,563**	**1,860**	**6**	**61**	**3,490**

Table 21: KSI by age 2003 to 2012

People in the 17 to 20 age group are most prevalent KSI in crashes followed by people in the 30 to 39 age group.

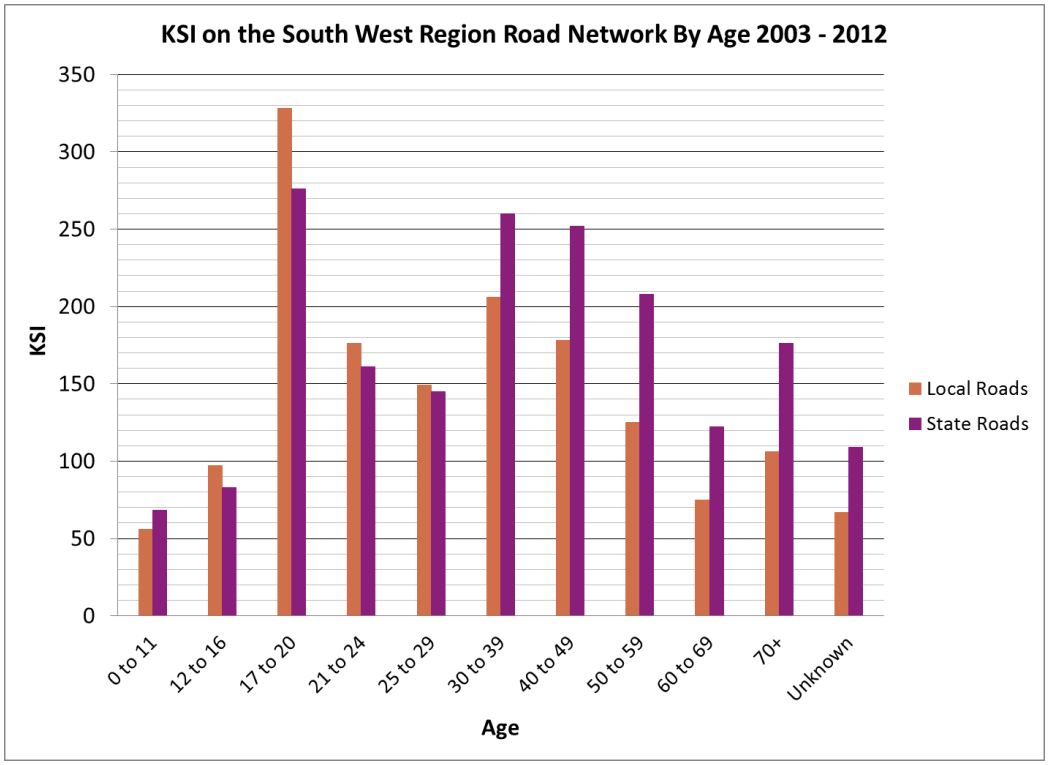

Figure 24: KSI by age 2003 to 2012

6. LOCAL GOVERNMENT ROAD CRASH AND KSI SUMMARIES

In this section, crash and KSI summaries are provided for each Local Government in the South West Region.

6.1 Shire of Augusta-Margaret River

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 22 displays all crashes in the Shire of Augusta-Margaret River by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	385	32.8
Intersection	**State, State**	8	0.7
Intersection	**State, LG**	150	12.8
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	480	40.9
Intersection	**LG, LG**	125	10.6
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	2	0.2
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	25	2.1
Total		**1,175**	**100.0**

Table 22: All crashes by crash location and road manager 2003 - 2012

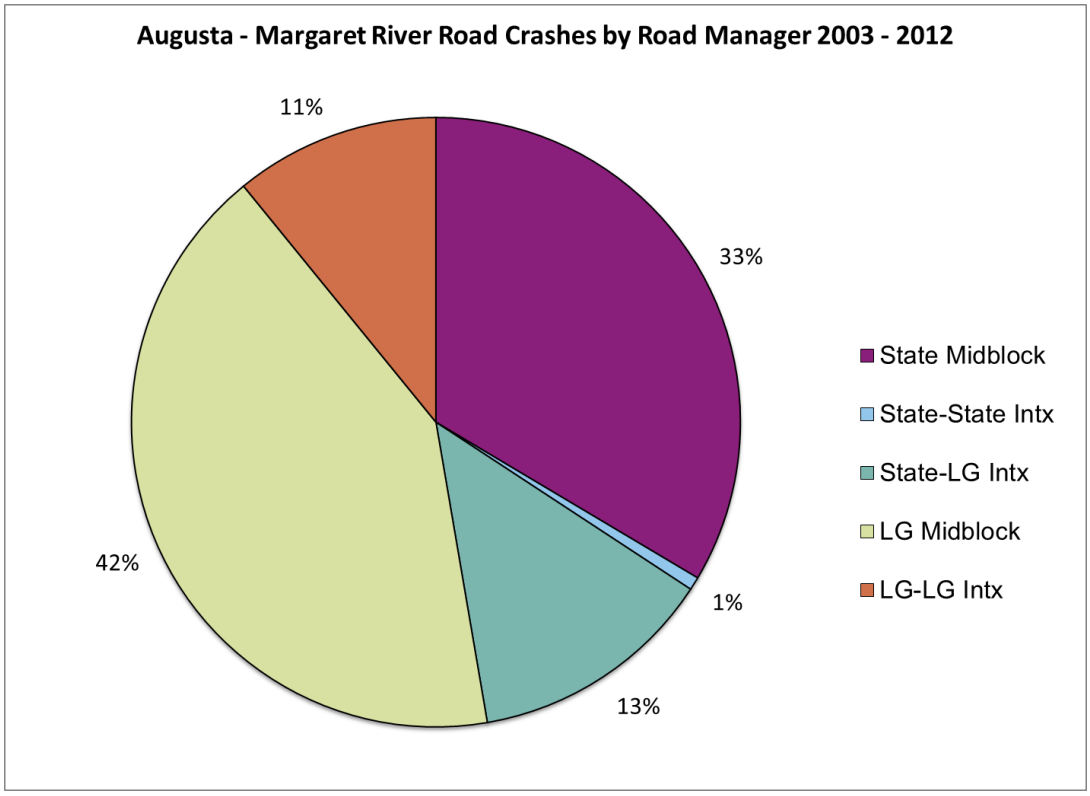

Figure 25: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 25 shows:

- 53% of crashes occurred at Local road locations including intersections where all legs were local roads.
- 13% of crashes occurred at intersections having both Local and State road legs.
- 34% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 25 also shows that 75% of crashes in the Shire of Augusta-Margaret River occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Augusta-Margaret local road network from 2003 to 2012 is shown in Table 23.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	11	9	10	5	8	15	2	1	20	0	**81**

Table 23: KSI trend 2003 - 2012

6.1.1 Crash Nature

A summary of KSI by crash nature on the Shire of Augusta-Margaret River local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 64% of KSI occurred in single vehicle crashes of Hit Object.
- 10% of KSI occurred in Head On crashes.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Augusta - Margaret River	South West	% for Augusta - Margaret River	Augusta - Margaret River
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	1	76	1.3	0
Head On	8	66	12.1	0
Sideswipe	0	43	0.0	0
Right Angle	3	243	1.2	0
Right Turn Thru	1	121	0.8	0
Multi-Vehicle Other	1	13	7.7	0
Multi-Vehicle Total	***14***	***562***	***2.5***	***0***
Single Vehicle Crashes				
Hit Pedestrian	7	117	6.0	0
Hit Animal	0	9	0.0	0
Hit Object	52	671	7.7	0
Non-Collision	7	179	3.9	0
Single Vehicle Other	1	25	4.0	0
Single Vehicle Total	***67***	***1,001***	***6.7***	***0***
Total	**81**	**1,563**	**5.2**	**0**

Table 24: KSI by crash nature 2003 - 2012

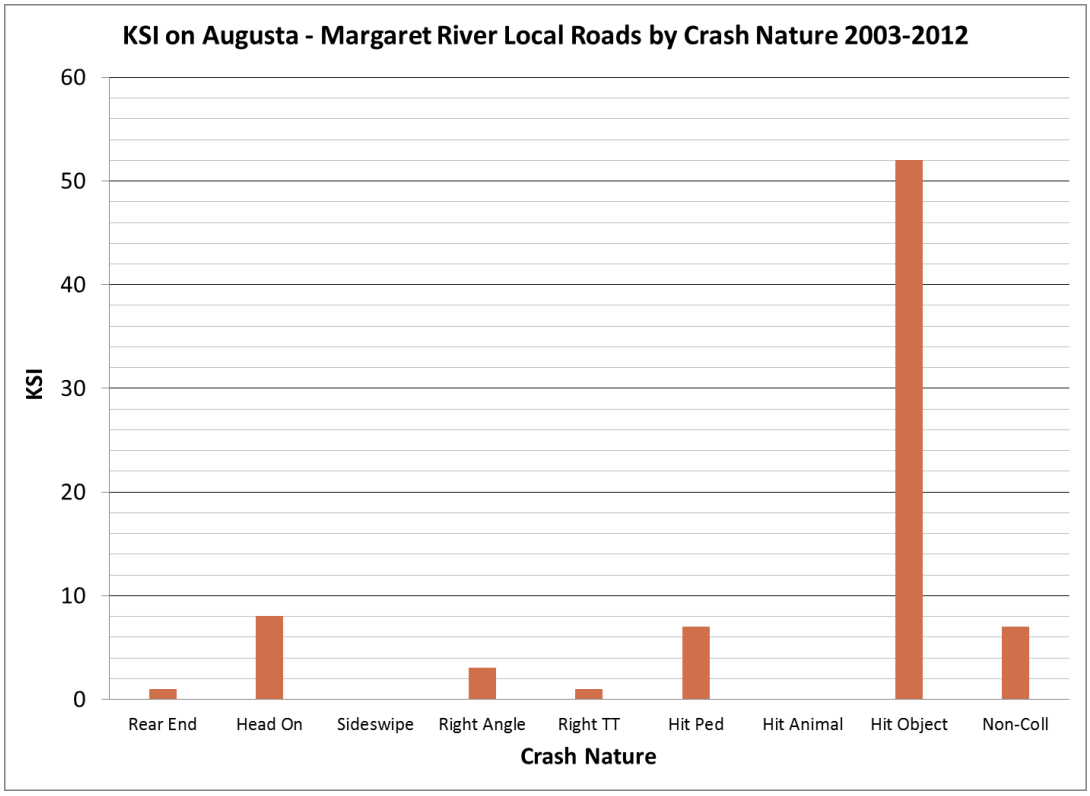

Figure 26: KSI by crash nature 2003 - 2012

6.1.2 Road User Type

KSI by road user type on the Shire of Augusta-Margaret River local road network from 2003 to 2012 is shown in Table 25 and Figure 27.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	40	54	1	2	97
Passenger	22	29	0	0	51
Motorcyclist	2	8	0	0	10
Bicyclist	2	1	0	0	3
Pedestrian	7	1	0	0	8
Other	8	0	0	0	8
Total	**81**	**93**	**1**	**2**	**177**

Table 25: KSI by road user 2003 - 2012

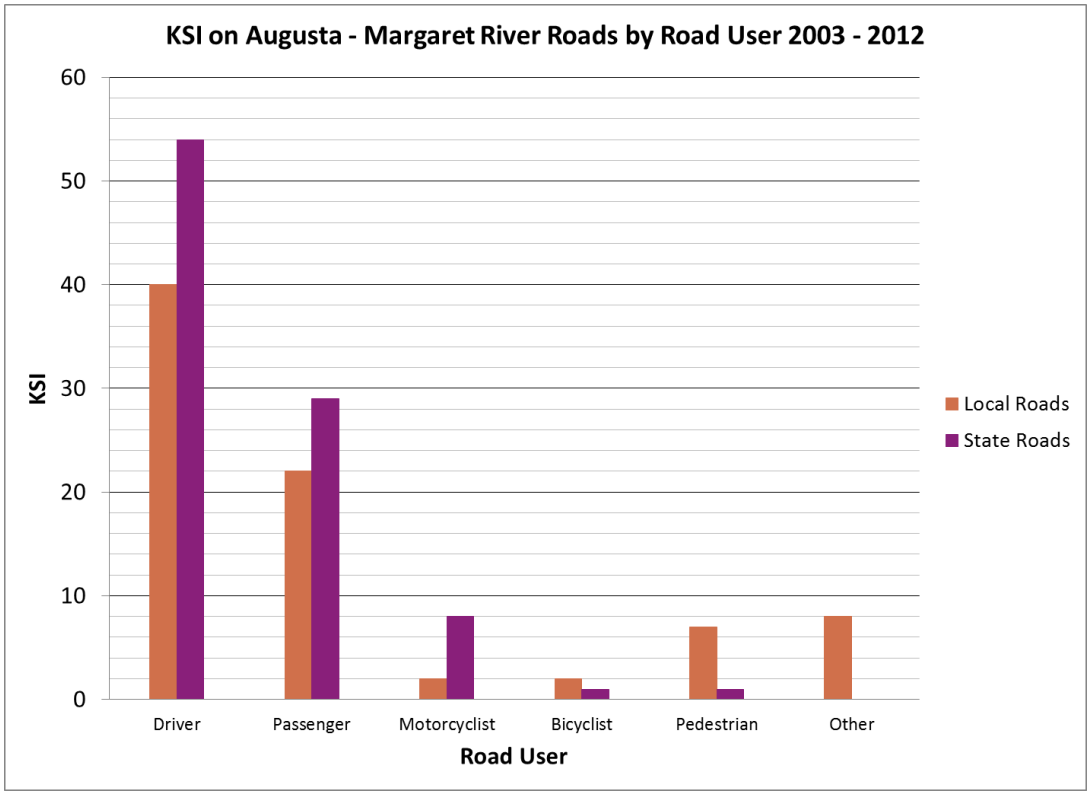

Figure 27: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 76% of KSI on local roads were drivers or passengers, and 9% were pedestrians. KSI for 2012 is shown in Table 26.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	0	3	0	0	3
Passenger	0	1	0	0	1
Motorcyclist	0	1	0	0	1
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**0**	**5**	**0**	**0**	**5**

Table 26: KSI by road user 2012

6.1.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Augusta-Margaret River local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	24	12	0	0	36
Seatbelts Not Worn	7	5	0	1	13
Alcohol	23	14	0	1	38
Speed	15	12	0	0	27

Table 27: KSI by contributing factor 2003 - 2012 (police attended)

Inattention, alcohol and speed are the dominant contributing factors in KSI on local roads. The non-wearing of seatbelts is also a contributing factor.

6.1.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	1	1
17 to 20	0	1	1
21 to 24	0	0	2
25 to 29	0	0	0
30 to 39	2	0	1
40 to 49	0	0	0
50 to 59	0	0	0
60 to 69	0	0	0
70+	0	0	0
Unknown	0	0	2
Total	**2**	**2**	**7**

Table 28: KSI by vulnerable road user and age 2003 - 2012

Four of the seven pedestrians KSI were aged from 12 to 24.

6.2 Shire of Boddington

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 29 displays all crashes in the Shire of Boddington by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	216	68.6
Intersection	**State, State**	1	0.3
Intersection	**State, LG**	17	5.4
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	71	22.5
Intersection	**LG, LG**	6	1.9
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	4	1.3
Total		**315**	**100.0**

Table 29: All crashes by crash location and road manager 2003 - 2012

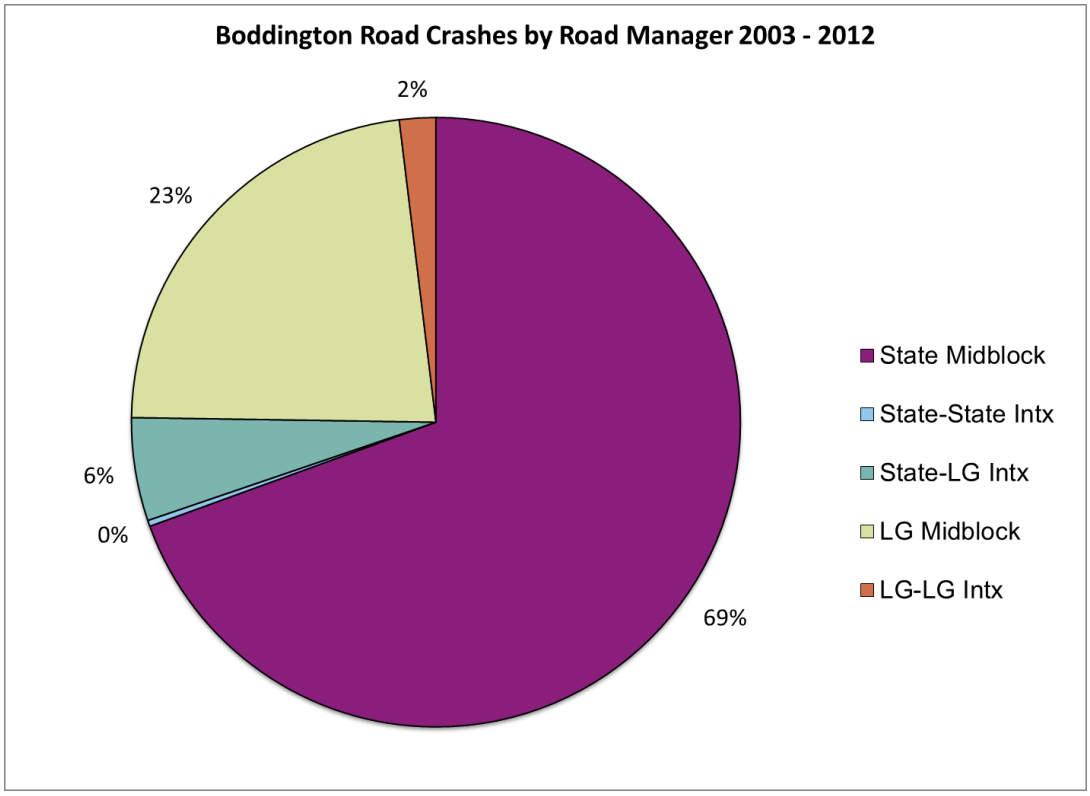

Figure 28: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 28 shows:

- 25% of crashes occurred at local road locations including intersections where all legs were local roads.
- 6% of crashes occurred at intersections having both Local and State road legs.
- 69% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 28 also shows that 92% of crashes in the Shire of Boddington occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Boddington local road network from 2003 to 2012 is shown in Table 30.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	1	1	2	1	3	4	1	1	3	1	**18**

Table 30: KSI trend 2003 - 2012

6.2.1 Crash Nature

A summary of KSI by crash nature on the Shire of Boddington local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 94% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Boddington	South West	% for Boddington	Boddington
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	1	66	1.5	0
Sideswipe	0	43	0.0	0
Right Angle	0	243	0.0	0
Right Turn Thru	0	121	0.0	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***1***	***562***	***0.2***	***0***
Single Vehicle Crashes				
Hit Pedestrian	0	117	0.0	0
Hit Animal	0	9	0.0	0
Hit Object	9	671	1.3	1
Non-Collision	8	179	4.5	0
Single Vehicle Other	0	25	0.0	0
Single Vehicle Total	***17***	***1,001***	***1.7***	***1***
Total	**18**	**1,563**	**1.2**	**1**

Table 31: KSI by crash nature 2003 - 2012

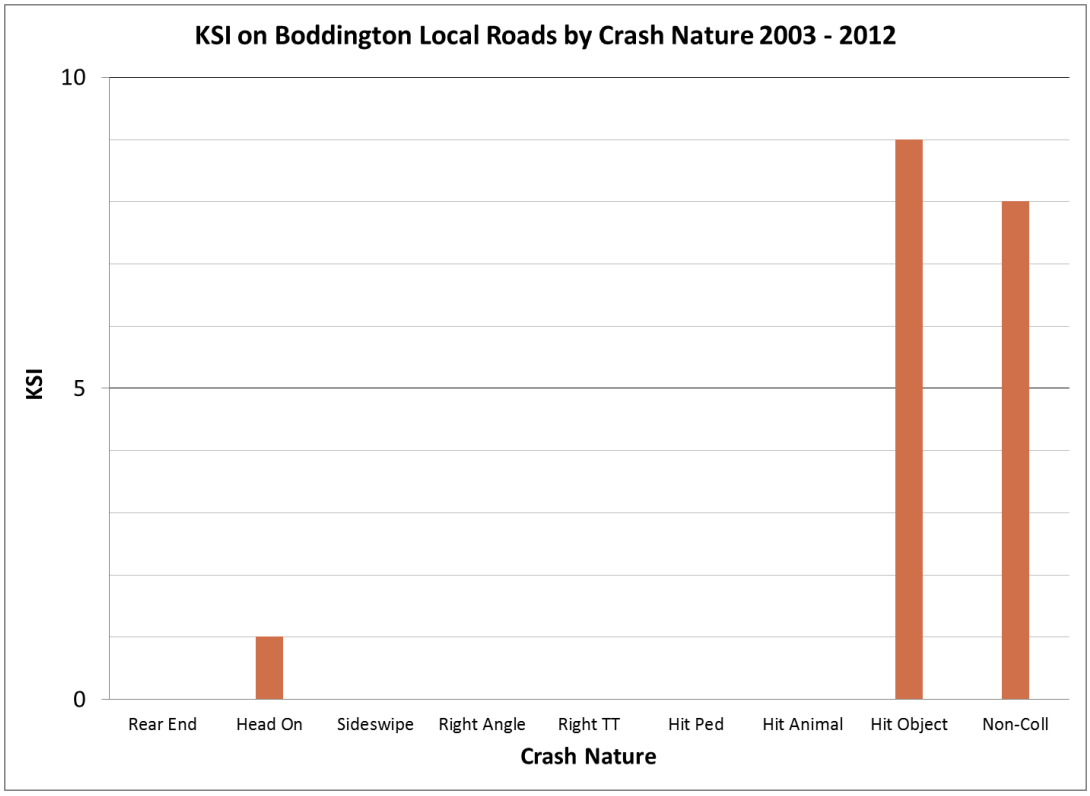

Figure 29: KSI by crash nature 2003 - 2012

6.2.2 Road User Type

KSI by road user type on the Shire of Boddington local road network from 2003 to 2012 is shown in Table 32 and Figure 30.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	14	34	0	1	49
Passenger	3	13	0	0	16
Motorcyclist	1	7	0	0	8
Bicyclist	0	0	0	0	0
Pedestrian	0	1	0	0	1
Other	0	0	0	0	0
Total	**18**	**55**	**0**	**1**	**74**

Table 32: KSI by road user 2003 - 2012

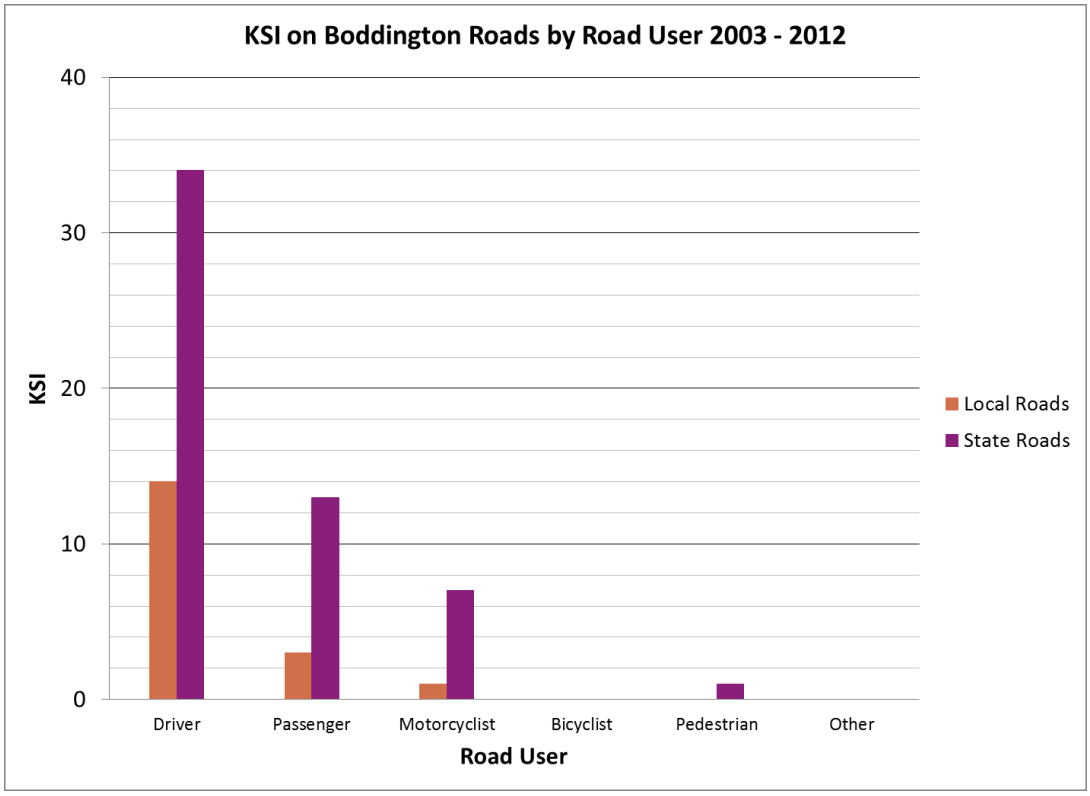

Figure 30: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 94% of KSI on local roads were drivers and passengers. KSI for 2012 is shown in Table 33.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	1	3	0	0	4
Passenger	0	0	0	0	0
Motorcyclist	0	1	0	0	1
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**1**	**4**	**0**	**0**	**5**

Table 33: KSI by road user 2012

6.2.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Boddington local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	4	6	0	0	10
Seatbelts Not Worn	1	7	0	0	8
Alcohol	0	7	0	0	7
Speed	5	8	0	0	13

Table 34: KSI by contributing factor 2003 - 2012 (police attended)

Speed and inattention are dominant contributing factors in KSI on local roads, which is consistent with the Hit Object and Non-Collision crash natures identified previously.

6.2.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	0	0
17 to 20	0	0	0
21 to 24	0	0	0
25 to 29	0	0	0
30 to 39	0	0	0
40 to 49	1	0	0
50 to 59	0	0	0
60 to 69	0	0	0
70+	0	0	0
Unknown	0	0	0
Total	**1**	**0**	**0**

Table 35: KSI by vulnerable road user and age 2003 – 2012

6.3 Shire of Boyup Brook

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 36 displays all crashes in the Shire of Boyup Brook by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	58	33.9
Intersection	**State, State**	0	0.0
Intersection	**State, LG**	10	5.8
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	90	52.6
Intersection	**LG, LG**	6	3.5
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	7	4.1
Total		**171**	**100.0**

Table 36: All crashes by crash location and road manager 2003 - 2012

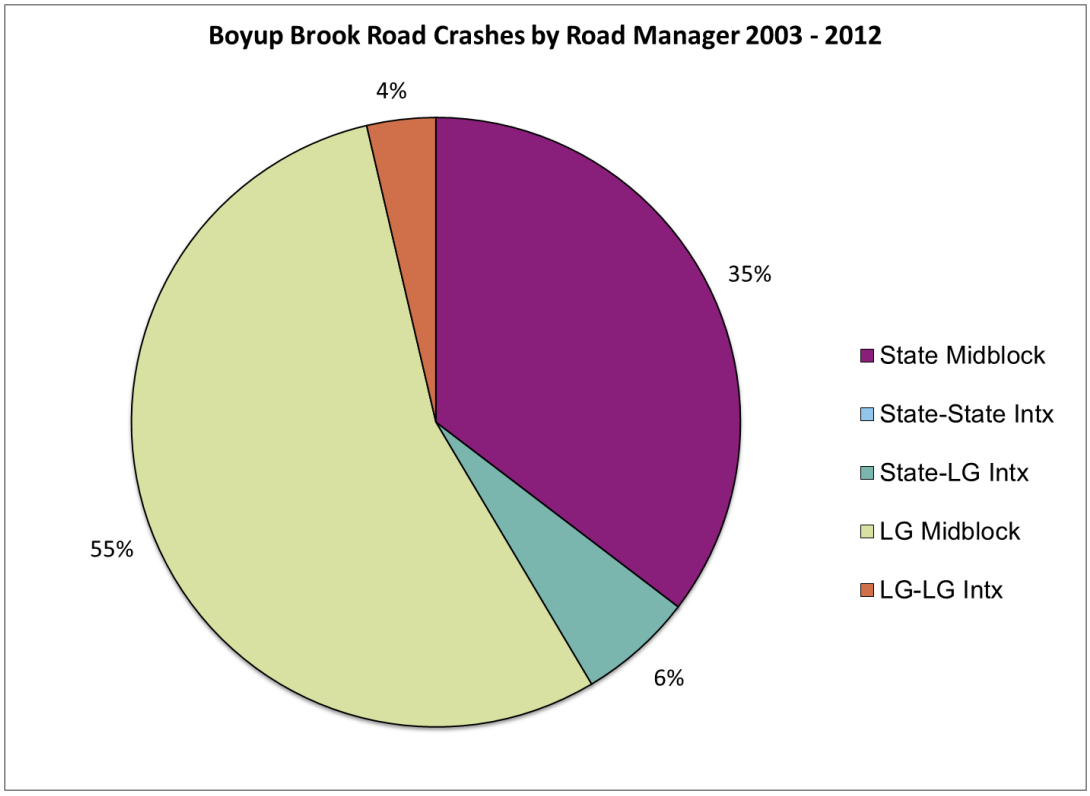

Figure 31: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 31 shows:

- 59% of crashes occurred at local road locations including intersections where all legs were local roads.
- 6% of crashes occurred at intersections having both Local and State road legs.
- 35% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 31 also shows that 90% of crashes in the Shire of Boyup Brook occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Boyup Brook local road network from 2003 to 2012 is shown in Table 37.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	0	0	2	2	4	2	3	4	1	1	**19**

Table 37: KSI trend 2003 - 2012

6.3.1 Crash Nature

A summary of KSI by crash nature on the Shire of Boyup Brook local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 79% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Boyup Brook	South West	% for Boyup Brook	Boyup Brook
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	1	66	1.5	0
Sideswipe	1	43	2.3	1
Right Angle	0	243	0.0	0
Right Turn Thru	0	121	0.0	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***2***	***562***	***0.4***	***1***
Single Vehicle Crashes				
Hit Pedestrian	0	117	0.0	0
Hit Animal	2	9	22.2	0
Hit Object	12	671	1.8	0
Non-Collision	3	179	1.7	0
Single Vehicle Other	0	25	0.0	0
Single Vehicle Total	***17***	***1,001***	***1.7***	***0***
Total	**19**	**1,563**	**1.2**	**1**

Table 38: KSI by crash nature 2003 - 2012

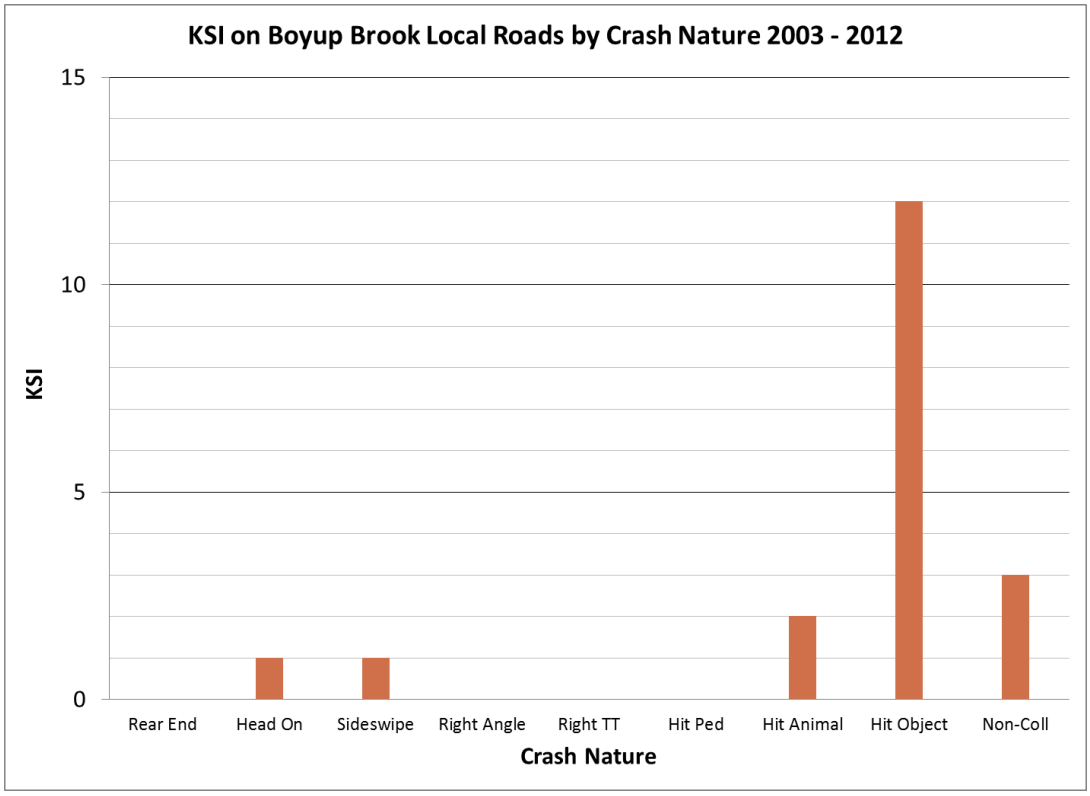

Figure 32: KSI by crash nature 2003 - 2012

6.3.2 Road User Type

KSI by road user type on the Shire of Boyup Brook local road network from 2003 to 2012 is shown in Table 39 and Figure 33.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	9	12	0	0	21
Passenger	7	4	0	0	11
Motorcyclist	3	0	0	0	3
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**19**	**16**	**0**	**0**	**35**

Table 39: KSI by road user 2003 - 2012

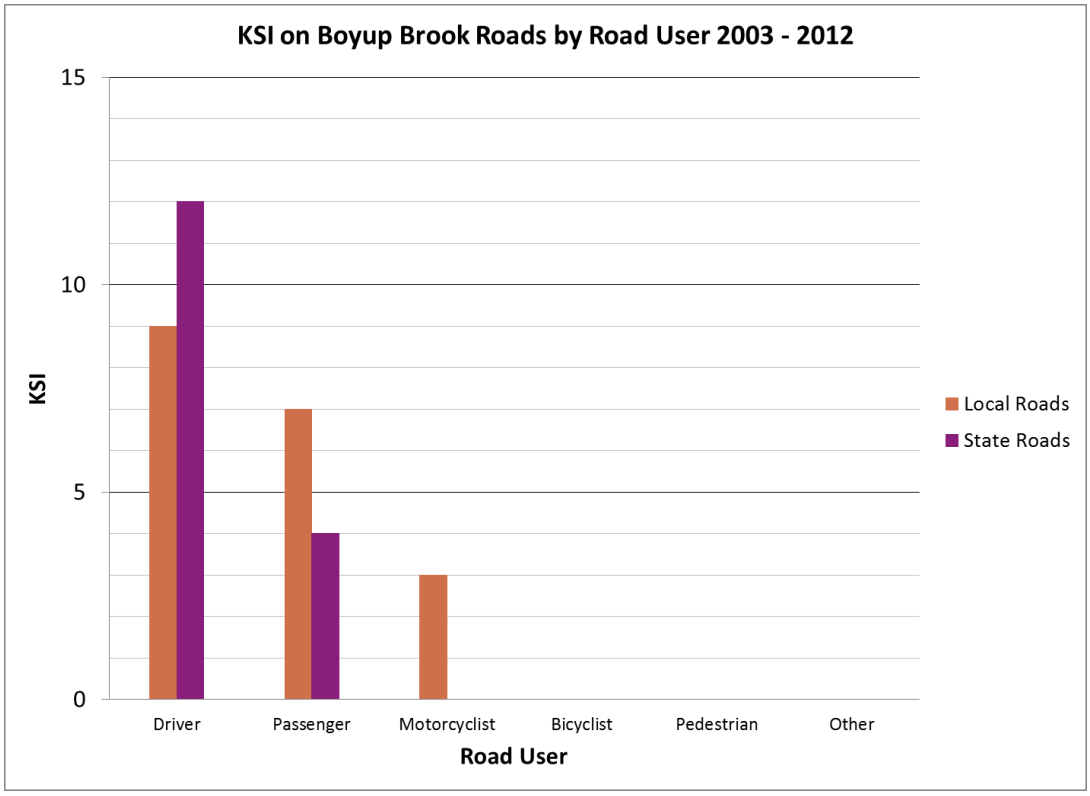

Figure 33: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 84% of KSI on local roads were drivers or passengers, and 16% were motorcyclists. KSI for 2012 is shown in Table 40.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	0	0	0	0	0
Passenger	0	0	0	0	0
Motorcyclist	1	0	0	0	1
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**1**	**0**	**0**	**0**	**1**

Table 40: KSI by road user 2012

6.3.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Boyup Brook local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	0	2	0	0	2
Seatbelts Not Worn	1	0	0	0	1
Alcohol	4	1	0	0	5
Speed	2	2	0	0	4

Table 41: KSI by contributing factor 2003 - 2012 (police attended)

Alcohol is the dominant contributing factor in KSI on local roads.

6.3.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	0	0
17 to 20	0	0	0
21 to 24	1	0	0
25 to 29	1	0	0
30 to 39	1	0	0
40 to 49	0	0	0
50 to 59	0	0	0
60 to 69	0	0	0
70+	0	0	0
Unknown	0	0	0
Total	**3**	**0**	**0**

Table 42: KSI by vulnerable road user and age 2003 – 2012

6.4 Shire of Bridgetown-Greenbushes

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 43 displays all crashes in the Shire of Bridgetown-Greenbushes by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	188	46.4
Intersection	**State, State**	0	0.0
Intersection	**State, LG**	35	8.6
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	154	38.0
Intersection	**LG, LG**	19	4.7
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	9	2.2
Total		**405**	**100.0**

Table 43: All crashes by crash location and road manager 2003 - 2012

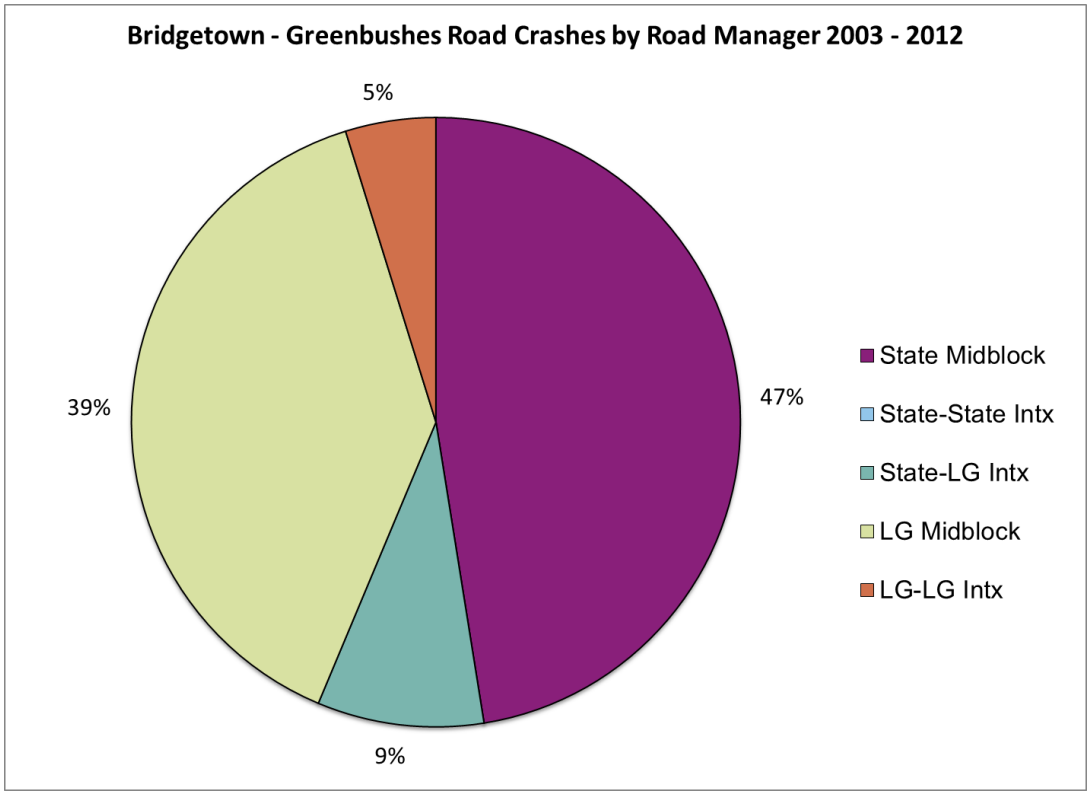

Figure 34: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 34 shows:

- 44% of crashes occurred at local road locations including intersections where all legs were local roads.
- 9% of crashes occurred at intersections having both Local and State road legs.
- 47% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 34 also shows that 86% of crashes in the Shire of Bridgetown-Greenbushes occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Bridgetown-Greenbushes local road network from 2003 to 2012 is shown in Table 44.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	5	4	0	2	3	9	2	1	2	0	**28**

Table 44: KSI trend 2003 - 2012

6.4.1 Crash Nature

A summary of KSI by crash nature on the Shire of Bridgetown-Greenbushes local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 79% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.
- 11% of KSI occurred in Head On crashes.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Bridgetown - Greenbushes	South West	% for Bridgetown - Greenbushes	Bridgetown - Greenbushes
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	2	66	3.0	0
Sideswipe	0	43	0.0	0
Right Angle	0	243	0.0	0
Right Turn Thru	0	121	0.0	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***2***	***562***	***0.4***	***0***
Single Vehicle Crashes				
Hit Pedestrian	3	117	2.6	0
Hit Animal	0	9	0.0	0
Hit Object	14	671	2.1	0
Non-Collision	8	179	4.5	0
Single Vehicle Other	1	25	4.0	0
Single Vehicle Total	***26***	***1,001***	***2.6***	***0***
Total	**28**	**1,563**	**1.8**	**0**

Table 45: KSI by crash nature 2003 - 2012

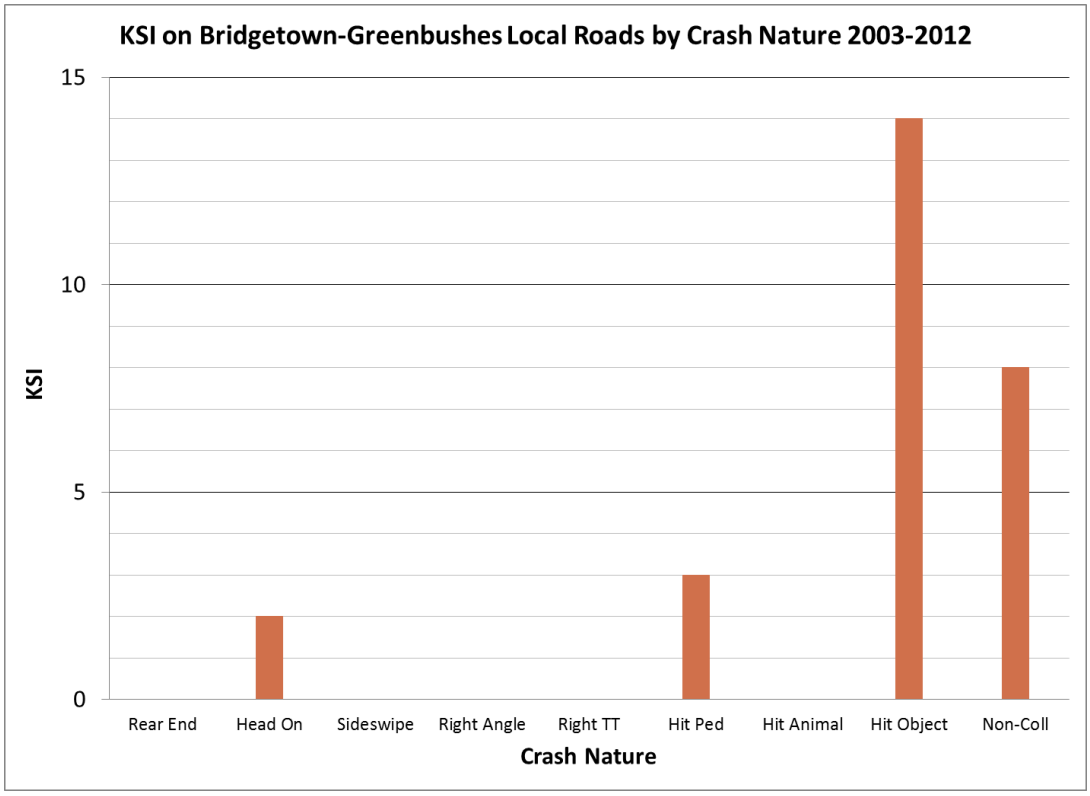

Figure 35: KSI by crash nature 2003 - 2012

6.4.2 Road User Type

KSI by road user type on the Shire of Bridgetown-Greenbushes local road network from 2003 to 2012 is shown in Table 46 and Figure 36.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	15	35	0	1	51
Passenger	7	13	0	0	20
Motorcyclist	4	7	0	1	12
Bicyclist	0	1	0	0	1
Pedestrian	2	3	0	0	5
Other	0	0	0	0	0
Total	**28**	**59**	**0**	**2**	**89**

Table 46: KSI by road user 2003 - 2012

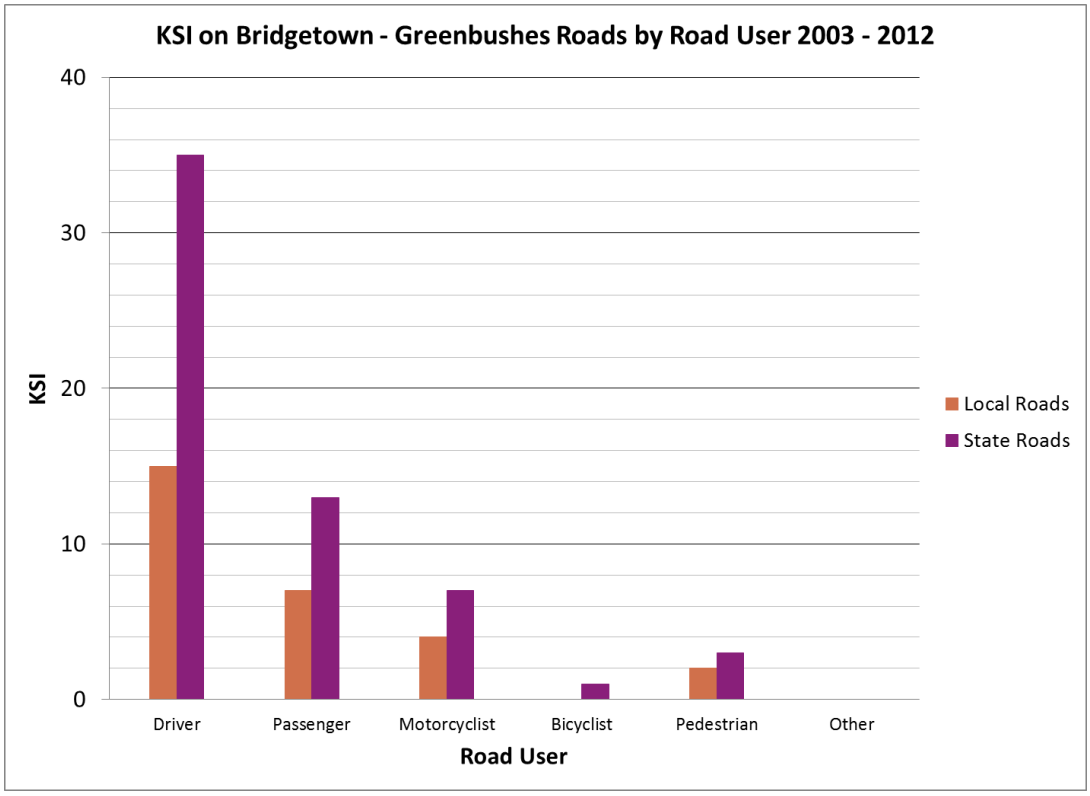

Figure 36: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 79% of KSI on local roads were drivers or passengers, and 14% were motorcyclists. KSI for 2012 is shown in Table 47.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	0	2	0	0	2
Passenger	0	1	0	0	1
Motorcyclist	0	1	0	0	1
Bicyclist	0	1	0	0	1
Pedestrian	0	1	0	0	1
Other	0	0	0	0	0
Total	**0**	**6**	**0**	**0**	**6**

Table 47: KSI by road user 2012

6.4.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Bridgetown-Greenbushes local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	1	4	0	0	5
Seatbelts Not Worn	2	0	0	0	2
Alcohol	6	9	0	0	15
Speed	2	7	0	0	9

Table 48: KSI by contributing factor 2003 - 2012 (police attended)

Alcohol is the dominant contributing factor in KSI.

6.4.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	0	0
17 to 20	1	0	2
21 to 24	0	0	0
25 to 29	1	0	0
30 to 39	0	0	0
40 to 49	0	0	0
50 to 59	2	0	0
60 to 69	0	0	0
70+	0	0	0
Unknown	0	0	0
Total	**4**	**0**	**2**

Table 49: KSI by vulnerable road user and age 2003 – 2012

6.5 City of Bunbury

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 50 displays all crashes in the City of Bunbury by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	371	5.4
Intersection	**State, State**	998	14.6
Intersection	**State, LG**	945	13.9
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	14	0.2
Midblock	**LG**	1,977	29.0
Intersection	**LG, LG**	2,478	36.3
Intersection	**LG, Other**	4	0.1
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	36	0.5
Total		**6,823**	**100.0**

Table 50: All crashes by crash location and road manager 2003 - 2012

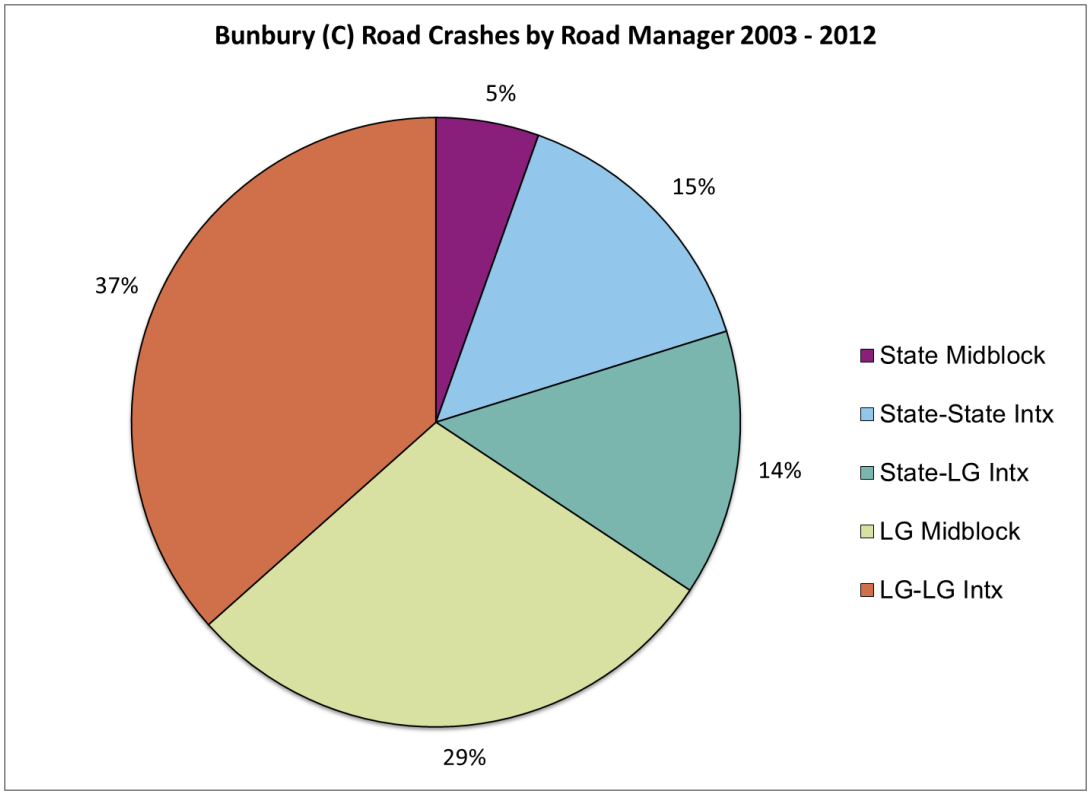

Figure 37: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 37 shows:

- 66% of crashes occurred at local road locations including intersections where all legs were local roads.
- 14% of crashes occurred at intersections having both Local and State road legs.
- 20% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 37 also shows that 66% of crashes in the City of Bunbury occurred at intersections on both Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the City of Bunbury local road network from 2003 to 2012 is shown in Table 51.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	37	24	23	37	28	38	23	32	28	23	**293**

Table 51: KSI trend 2003 - 2012

6.5.1 Crash Nature

A summary of KSI by crash nature on the City of Bunbury local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 41% of KSI occurred in multi-vehicle crashes of Right Angle and Right Turn Thru;
- 31% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision; and
- 11% of KSI occurred in Hit Pedestrian crashes.

Crash Nature	**Local Government and Region**			
	2003 - 2012			**2012**
	Bunbury (C)	**South West**	**% for Bunbury (C)**	**Bunbury (C)**
	n	**n**	**%**	**n**
Multi-Vehicle Crashes				
Rear End	22	76	28.9	3
Head On	11	66	16.7	0
Sideswipe	15	43	34.9	1
Right Angle	71	243	29.2	3
Right Turn Thru	48	121	39.7	2
Multi-Vehicle Other	3	13	23.1	2
Multi-Vehicle Total	***170***	***562***	***30.2***	***11***
Single Vehicle Crashes				
Hit Pedestrian	31	117	26.5	6
Hit Animal	0	9	0.0	0
Hit Object	74	671	11.0	4
Non-Collision	16	179	8.9	2
Single Vehicle Other	2	25	8.0	0
Single Vehicle Total	***123***	***1,001***	***12.3***	***12***
Total	**293**	**1,563**	**18.7**	**23**

Table 52: KSI by crash nature 2003 - 2012

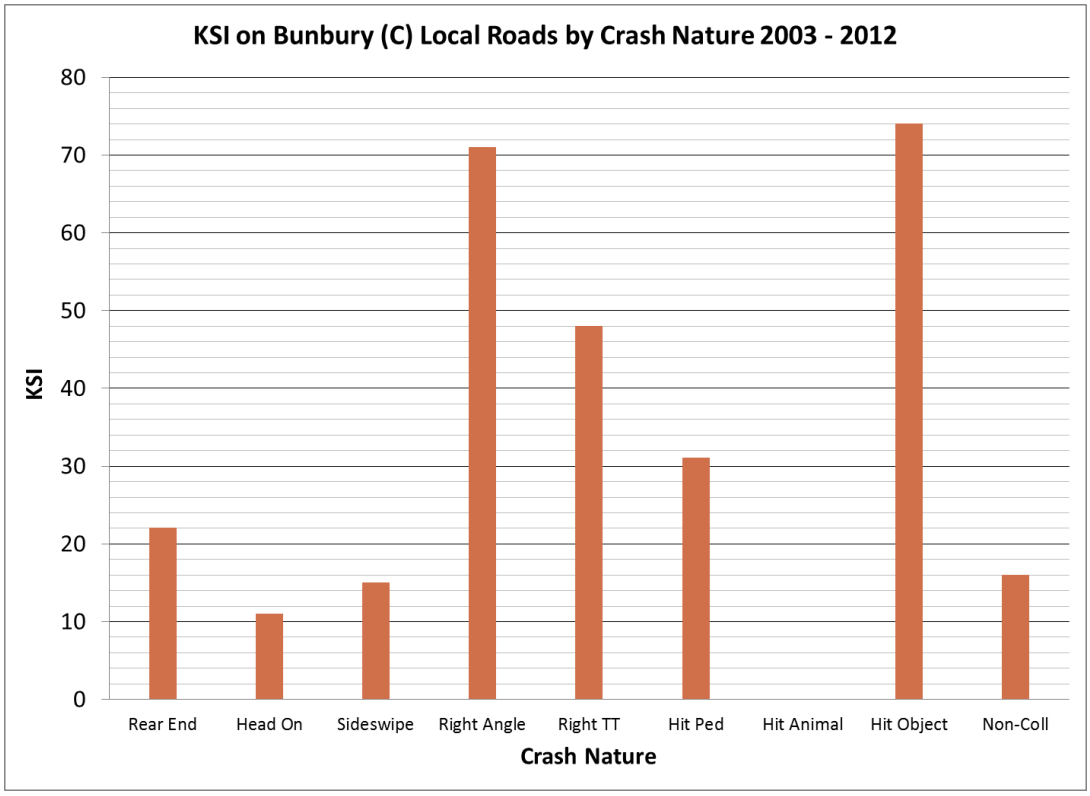

Figure 38: KSI by crash nature 2003 - 2012

6.5.2 Road User Type

KSI by road user type on the City of Bunbury local road network from 2003 to 2012 is shown in Table 53 and Figure 39.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	129	62	0	0	191
Passenger	62	23	0	0	85
Motorcyclist	49	15	0	0	64
Bicyclist	16	5	0	0	21
Pedestrian	34	5	0	0	39
Other	3	4	0	0	7
Total	**293**	**114**	**0**	**0**	**407**

Table 53: KSI by road user 2003 - 2012

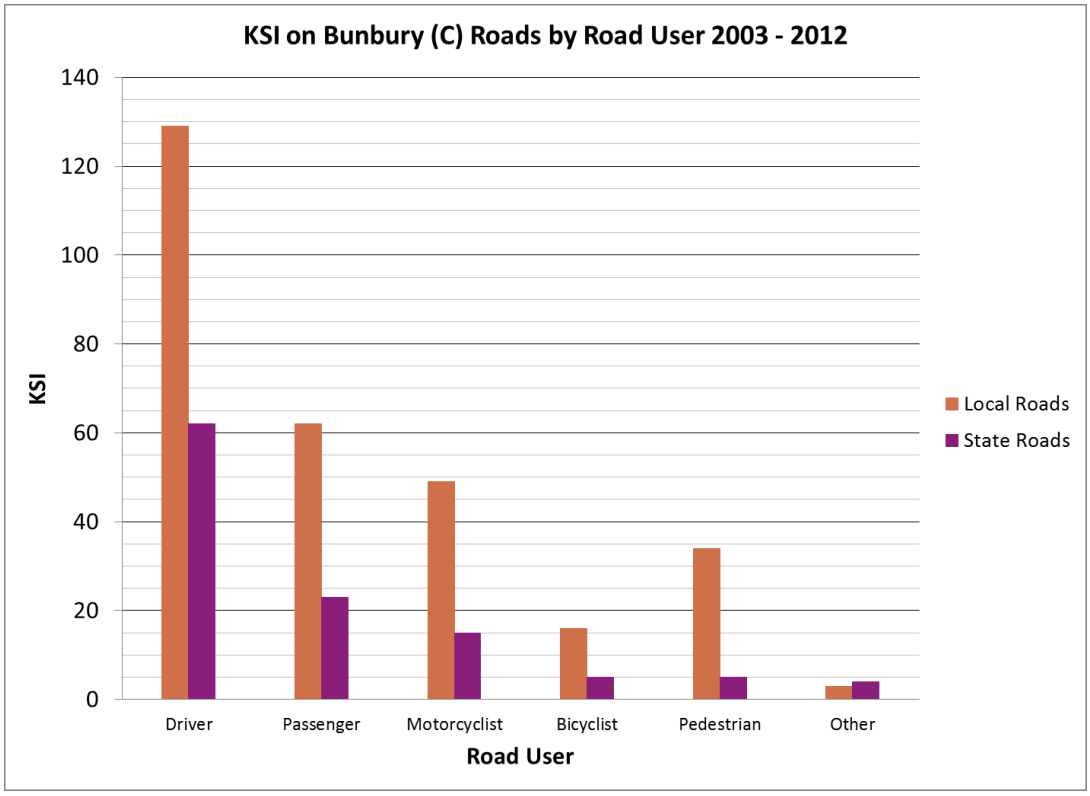

Figure 39: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 34% of KSI on local roads were vulnerable road users defined as motorcyclists, bicyclists or pedestrians. KSI for 2012 is shown in Table 54.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	10	6	0	0	16
Passenger	1	1	0	0	2
Motorcyclist	2	1	0	0	3
Bicyclist	4	1	0	0	5
Pedestrian	6	0	0	0	6
Other	0	0	0	0	0
Total	**23**	**9**	**0**	**0**	**32**

Table 54: KSI by road user 2012

6.5.3 Road User Behaviour

The following table shows factors contributing to KSI on the City of Bunbury local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	68	34	0	0	102
Seatbelts Not Worn	18	1	0	0	19
Alcohol	35	4	0	0	39
Speed	48	10	0	0	58

Table 55: KSI by contributing factor 2003 - 2012 (police attended)

Inattention, speed and alcohol are dominant contributing factors in KSI on local roads.

6.5.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	3	1
12 to 16	5	5	2
17 to 20	6	2	3
21 to 24	11	1	2
25 to 29	4	1	3
30 to 39	11	0	1
40 to 49	4	0	6
50 to 59	5	3	5
60 to 69	2	1	1
70+	1	0	8
Unknown	0	0	2
Total	**49**	**16**	**34**

Table 56: KSI by vulnerable road user and age 2003 - 2012

Table 56 shows:

- 53% of motorcyclists KSI were aged 21 to 39;
- 50% of bicyclists KSI were aged 16 or younger; and
- 32% of pedestrians KSI were aged 40 to 59, and 23% were aged 70 or older.

6.6 City of Busselton

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 57 displays all crashes in the City of Busselton by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	546	16.6
Intersection	**State, State**	113	3.4
Intersection	**State, LG**	278	8.5
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	1	0.0
Midblock	**LG**	1,400	42.6
Intersection	**LG, LG**	891	27.1
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	1	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	59	1.8
Total		**3,289**	**100.0**

Table 57: All crashes by crash location and road manager 2003 - 2012

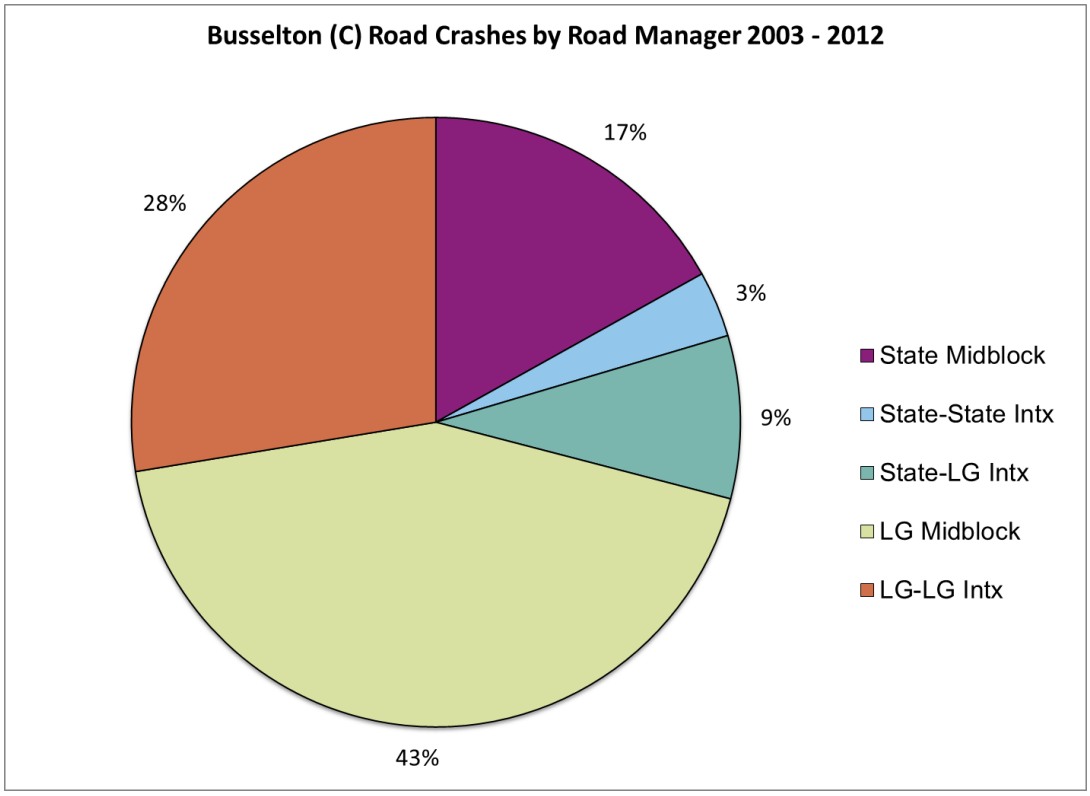

Figure 40: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 40 shows:

- 71% of crashes occurred at local road locations including intersections where all legs were local roads.
- 9% of crashes occurred at intersections having both Local and State road legs.
- 20% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 40 also shows that 60% of crashes in the City of Busselton occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the City of Busselton local road network from 2003 to 2012 is shown in Table 58.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	19	18	18	24	13	18	14	22	16	20	**182**

Table 58: KSI trend 2003 - 2012

6.6.1 Crash Nature

A summary of KSI by crash nature on the City of Busselton local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 55% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision;
- 24% of KSI occurred in multi-vehicle crashes of Right Angle and Right Turn Thru; and
- 8% of KSI occurred in Hit Pedestrian crashes.

Crash Nature	**Local Government and Region**			
	2003 - 2012			**2012**
	Busselton (C)	**South West**	**% for Busselton (C)**	**Busselton (C)**
	n	**n**	**%**	**n**
Multi-Vehicle Crashes				
Rear End	12	76	15.8	1
Head On	5	66	7.6	0
Sideswipe	3	43	7.0	1
Right Angle	33	243	13.6	3
Right Turn Thru	11	121	9.1	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***64***	***562***	***11.4***	***5***
Single Vehicle Crashes				
Hit Pedestrian	15	117	12.8	2
Hit Animal	1	9	11.1	0
Hit Object	84	671	12.5	10
Non-Collision	16	179	8.9	3
Single Vehicle Other	2	25	8.0	0
Single Vehicle Total	***118***	***1,001***	***11.8***	***15***
Total	**182**	**1,563**	**11.6**	**20**

Table 59: KSI by crash nature 2003 - 2012

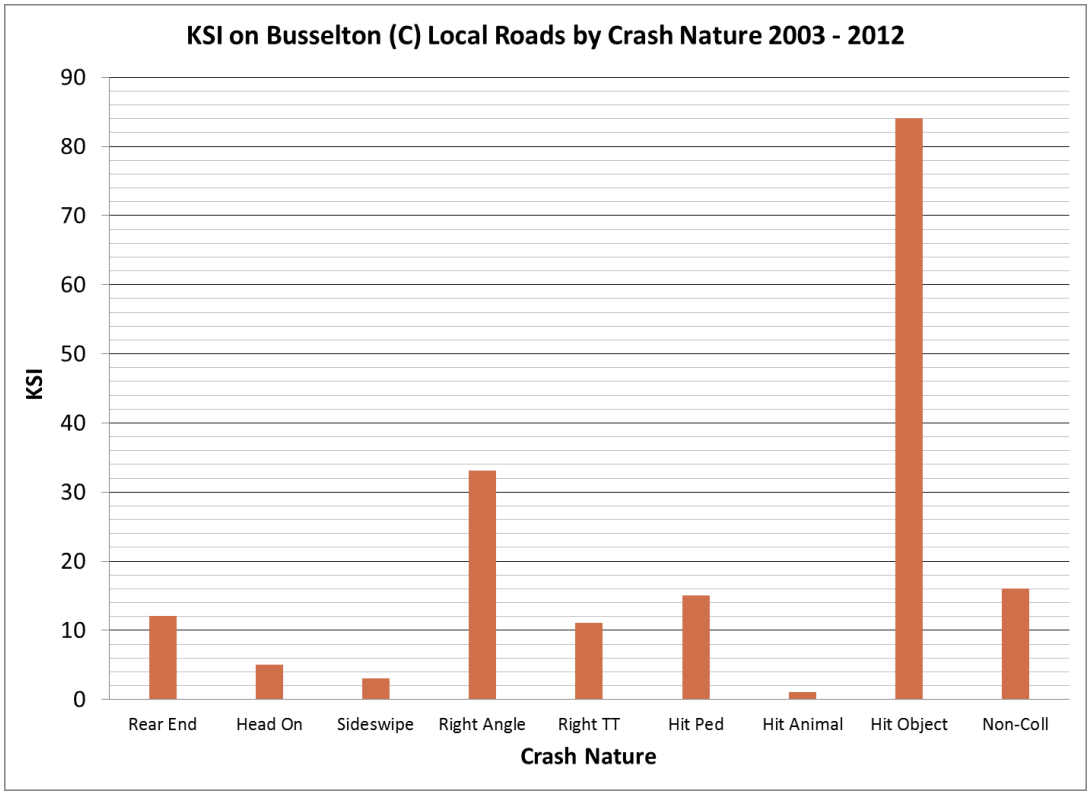

Figure 41: KSI by crash nature 2003 - 2012

6.6.2 Road User Type

KSI by road user type on the City of Busselton local road network from 2003 to 2012 is shown in Table 60 and Figure 42.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	101	108	0	2	211
Passenger	39	54	0	3	96
Motorcyclist	16	6	0	2	24
Bicyclist	9	1	0	0	10
Pedestrian	15	5	0	0	20
Other	2	1	0	0	3
Total	**182**	**175**	**0**	**7**	**364**

Table 60: KSI by road user 2003 - 2012

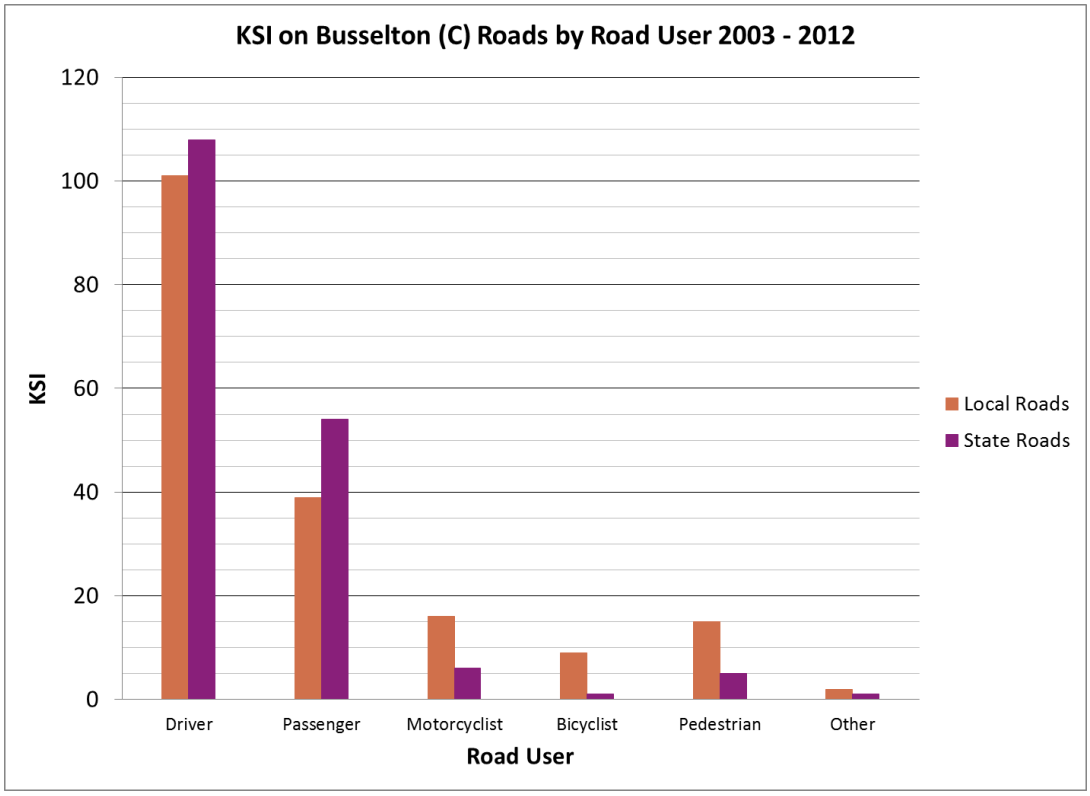

Figure 42: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 22% of KSI on local roads were vulnerable road users defined as motorcyclists, bicyclists or pedestrians. KSI for 2012 is shown in Table 61.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	13	6	0	1	20
Passenger	3	4	0	0	7
Motorcyclist	1	0	0	0	1
Bicyclist	0	0	0	0	0
Pedestrian	2	0	0	0	2
Other	1	0	0	0	1
Total	**20**	**10**	**0**	**1**	**31**

Table 61: KSI by road user 2012

6.6.3 Road User Behaviour

The following table shows factors contributing to KSI on the City of Busselton local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	31	47	0	0	78
Seatbelts Not Worn	12	8	0	0	20
Alcohol	28	25	0	2	55
Speed	39	29	0	0	68

Table 62: KSI by contributing factor 2003 - 2012 (police attended)

Speed, inattention and alcohol are dominant contributing factors in KSI on local roads.

6.6.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	1	4
12 to 16	0	1	2
17 to 20	1	0	2
21 to 24	3	0	0
25 to 29	1	1	2
30 to 39	3	1	2
40 to 49	2	2	0
50 to 59	4	0	0
60 to 69	1	0	1
70+	0	2	1
Unknown	1	1	1
Total	**16**	**9**	**15**

Table 63: KSI by vulnerable road user and age 2003 - 2012

Table 57 shows:

- 44% of motorcyclists KSI were aged 21 to 39; and
- 53% of pedestrians KSI were aged 20 or younger.

6.7 Shire of Capel

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 64 displays all crashes in the Shire of Capel by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	455	44.3
Intersection	**State, State**	6	0.6
Intersection	**State, LG**	247	24.1
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	3	0.3
Midblock	**LG**	216	21.1
Intersection	**LG, LG**	85	8.3
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	14	1.4
Total		**1,026**	**100.0**

Table 64: All crashes by crash location and road manager 2003 - 2012

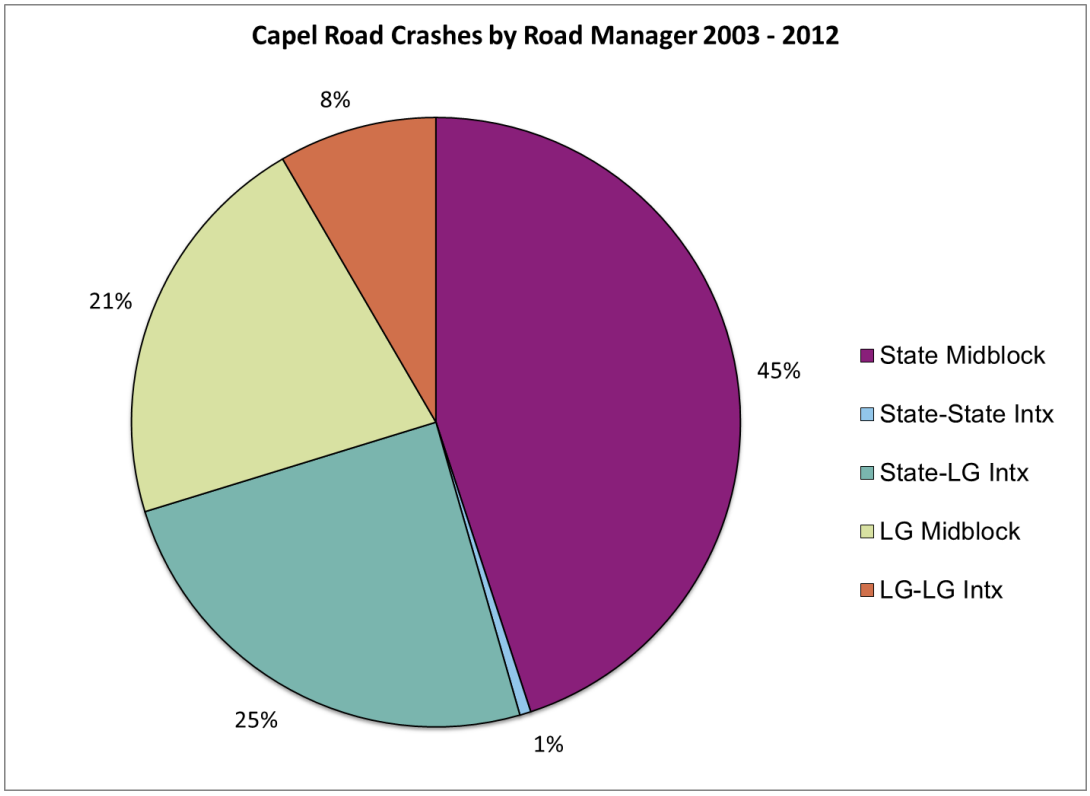

Figure 43: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 43 shows:

- 29% of crashes occurred at local road locations including intersections where all legs were local roads.
- 25% of crashes occurred at intersections having both Local and State road legs.
- 46% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 43 also shows that 66% of crashes in the Shire of Capel occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Capel local road network from 2003 to 2012 is shown in Table 65.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	1	1	8	4	1	5	3	7	4	8	**42**

Table 65: KSI trend 2003 - 2012

The ten year KSI trend for the Shire of Capel is increasing.

6.7.1 Crash Nature

A summary of KSI by crash nature on the Shire of Capel local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 71% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Capel	South West	% for Capel	Capel
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	0	66	0.0	0
Sideswipe	1	43	2.3	1
Right Angle	4	243	1.6	0
Right Turn Thru	0	121	0.0	0
Multi-Vehicle Other	1	13	7.7	0
Multi-Vehicle Total	***6***	***562***	***1.1***	***1***
Single Vehicle Crashes				
Hit Pedestrian	3	117	2.6	0
Hit Animal	1	9	11.1	0
Hit Object	21	671	3.1	6
Non-Collision	9	179	5.0	0
Single Vehicle Other	2	25	8.0	1
Single Vehicle Total	***36***	***1,001***	***3.6***	***7***
Total	**42**	**1,563**	**2.7**	**8**

Table 66: KSI by crash nature 2003 - 2012

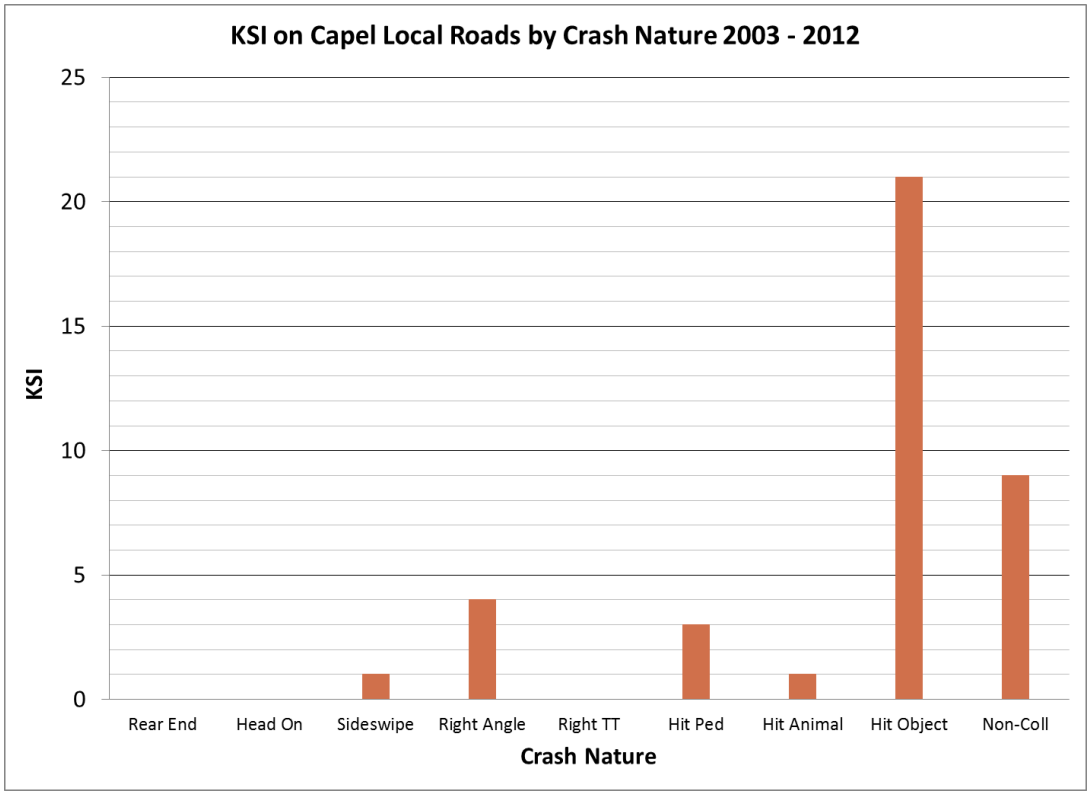

Figure 44: KSI by crash nature 2003 - 2012

6.7.2 Road User Type

KSI by road user type on the Shire of Capel local road network from 2003 to 2012 is shown in Table 67 and Figure 45.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	22	91	0	1	114
Passenger	12	49	0	0	61
Motorcyclist	4	11	0	0	15
Bicyclist	1	3	0	0	4
Pedestrian	3	1	0	0	4
Other	0	2	0	0	2
Total	**42**	**157**	**0**	**1**	**200**

Table 67: KSI by road user 2003 - 2012

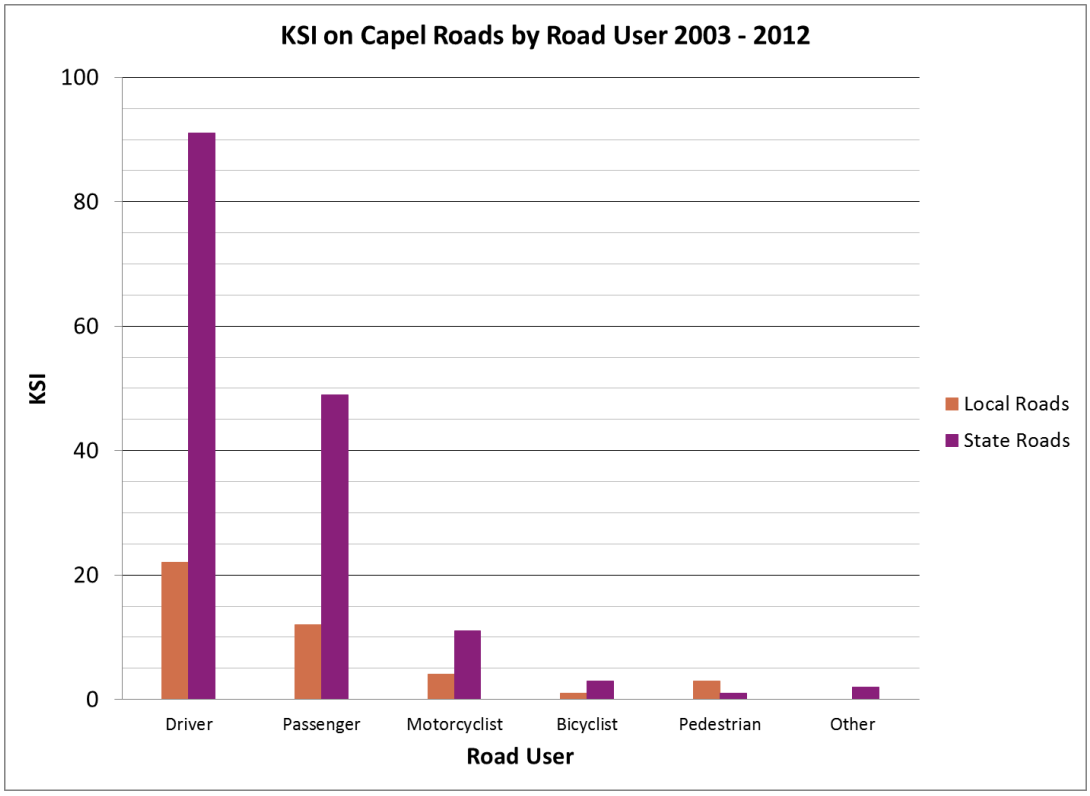

Figure 45: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 19% of KSI on local roads were vulnerable road users defined as motorcyclists, bicyclists or pedestrians. KSI for 2012 is shown in Table 68.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	4	10	0	0	14
Passenger	3	11	0	0	14
Motorcyclist	1	1	0	0	2
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**8**	**22**	**0**	**0**	**30**

Table 68: KSI by road user 2012

6.7.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Capel local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	3	29	0	1	33
Seatbelts Not Worn	2	6	0	0	8
Alcohol	8	7	0	0	15
Speed	10	10	0	0	20

Table 69: KSI by contributing factor 2003 - 2012 (police attended)

Speed and alcohol are significant contributing factors in KSI on local roads.

6.7.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	1	0	1
17 to 20	1	0	1
21 to 24	0	0	0
25 to 29	0	0	0
30 to 39	0	0	0
40 to 49	2	0	0
50 to 59	0	0	0
60 to 69	0	1	0
70+	0	0	0
Unknown	0	0	1
Total	**4**	**1**	**3**

Table 70: KSI by vulnerable road user and age 2003 – 2012

6.8 Shire of Collie

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 71 displays all crashes in the Shire of Collie by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	233	25.9
Intersection	**State, State**	8	0.9
Intersection	**State, LG**	80	8.9
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	355	39.5
Intersection	**LG, LG**	168	18.7
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	1	0.1
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	54	6.0
Total		**899**	**100.0**

Table 71: All crashes by crash location and road manager 2003 - 2012

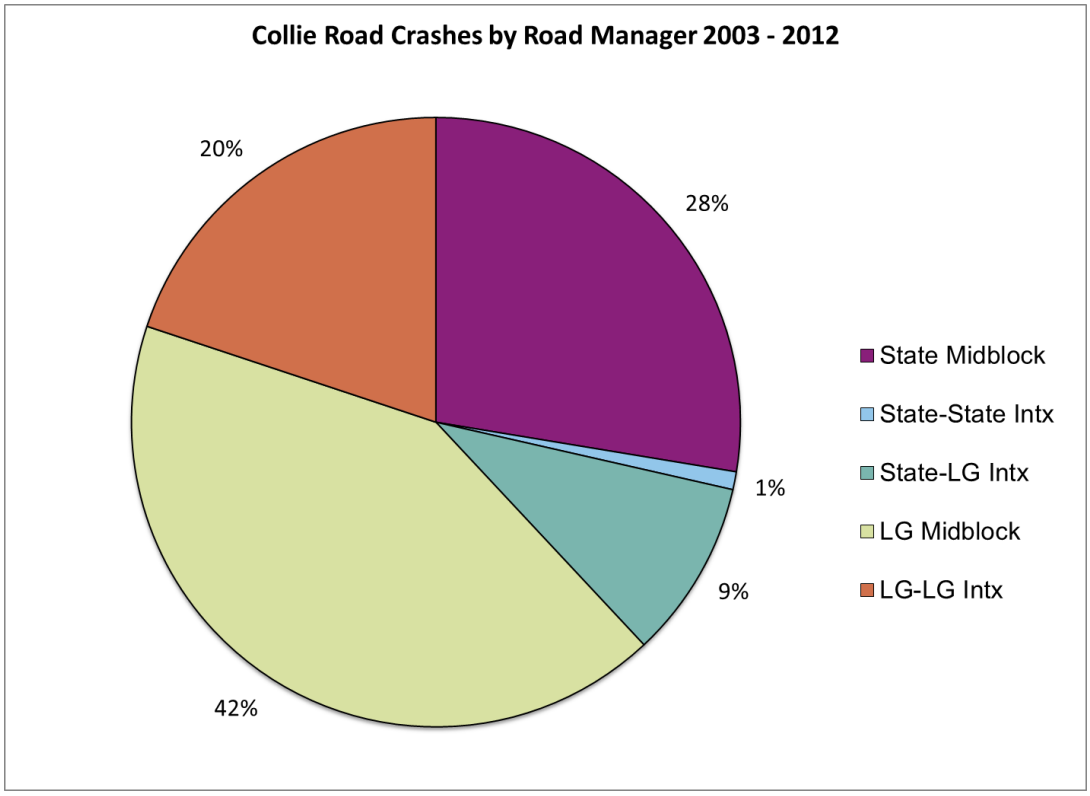

Figure 46: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 46 shows:

- 62% of crashes occurred at local road locations including intersections where all legs were local roads.
- 9% of crashes occurred at intersections having both Local and State road legs.
- 29% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 46 also shows that 70% of crashes in the Shire of Collie occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Collie local road network from 2003 to 2012 is shown in Table 72.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	7	2	5	2	10	9	2	8	4	6	**55**

Table 72: KSI trend 2003 - 2012

6.8.1 Crash Nature

A summary of KSI by crash nature on the Shire of Collie local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 56% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision; and
- 16% of KSI occurred in multi-vehicle Right Angle crashes.

Crash Nature	**Local Government and Region**			
	2003 - 2012			**2012**
	Collie	**South West**	**% for Collie**	**Collie**
	n	**n**	**%**	**n**
Multi-Vehicle Crashes				
Rear End	3	76	3.9	0
Head On	4	66	6.1	0
Sideswipe	0	43	0.0	0
Right Angle	9	243	3.7	1
Right Turn Thru	1	121	0.8	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***17***	***562***	***3.0***	***1***
Single Vehicle Crashes				
Hit Pedestrian	6	117	5.1	0
Hit Animal	1	9	11.1	0
Hit Object	23	671	3.4	2
Non-Collision	8	179	4.5	3
Single Vehicle Other	0	25	0.0	0
Single Vehicle Total	***38***	***1,001***	***3.8***	***5***
Total	**55**	**1,563**	**3.5**	**6**

Table 73: KSI by crash nature 2003 - 2012

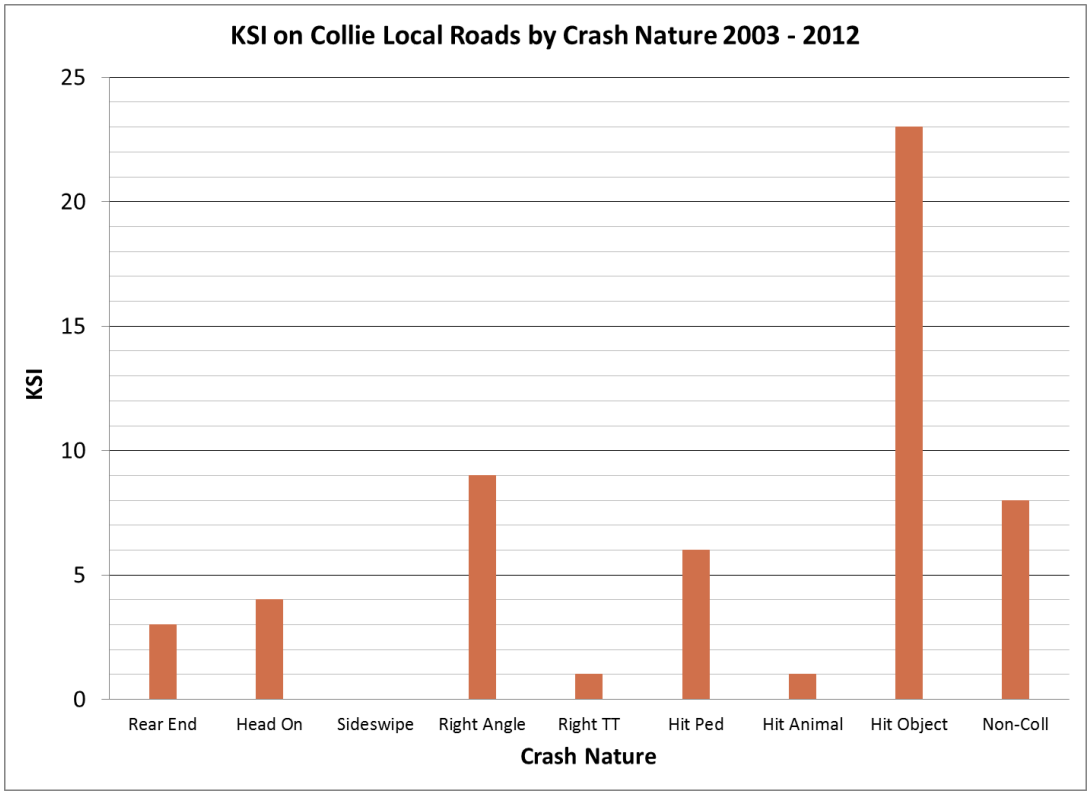

Figure 47: KSI by crash nature 2003 - 2012

6.8.2 Road User Type

KSI by road user type on the Shire of Collie local road network from 2003 to 2012 is shown in Table 74 and Figure 48.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	20	35	1	3	59
Passenger	11	22	0	1	34
Motorcyclist	12	5	0	1	18
Bicyclist	4	0	0	0	4
Pedestrian	6	0	0	0	6
Other	2	0	0	0	2
Total	**55**	**62**	**1**	**5**	**123**

Table 74: KSI by road user 2003 - 2012

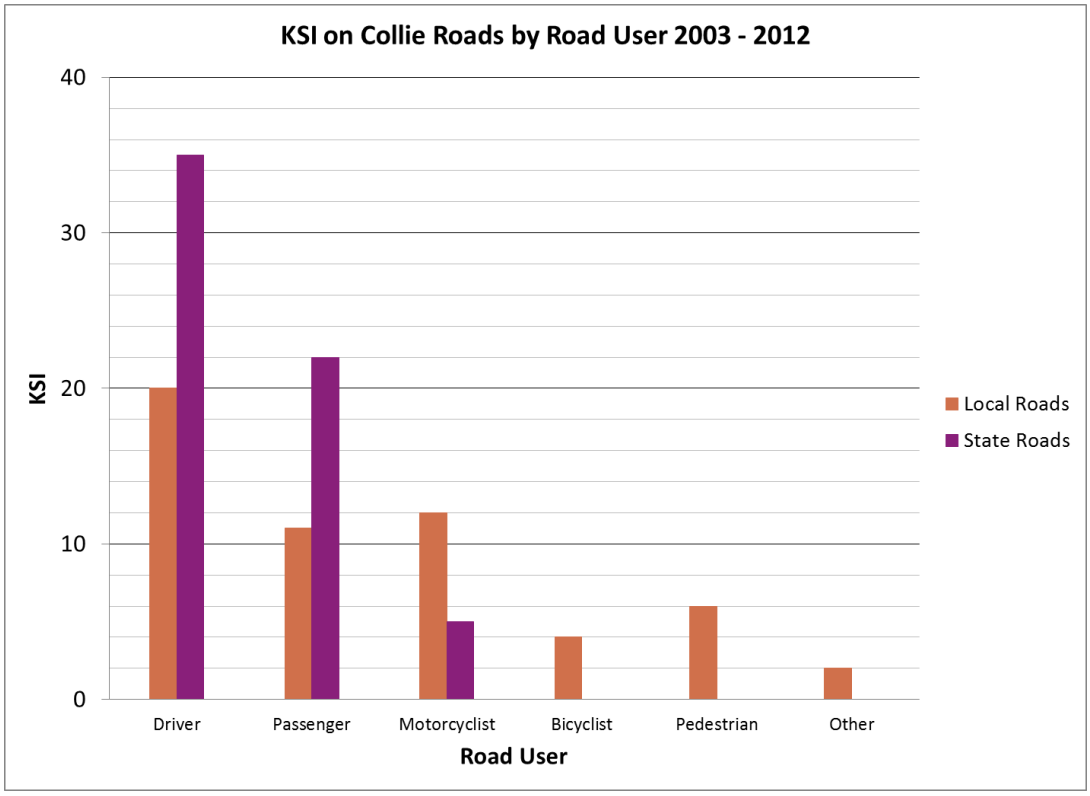

Figure 48: KSI by road user 2003 - 2012

From 2003 to 2012, 40% of KSI on local roads were vulnerable road users defined as motorcyclists, bicyclists or pedestrians. KSI for 2012 is shown in Table 75.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	2	7	0	0	9
Passenger	0	3	0	0	3
Motorcyclist	2	0	0	0	2
Bicyclist	1	0	0	0	1
Pedestrian	0	0	0	0	0
Other	1	0	0	0	1
Total	**6**	**10**	**0**	**0**	**16**

Table 75: KSI by road user 2012

6.8.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Collie local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	6	11	0	0	17
Seatbelts Not Worn	6	3	0	0	9
Alcohol	8	10	0	0	18
Speed	15	8	0	2	25

Table 76: KSI by contributing factor 2003 - 2012 (police attended)

Speed is the dominant contributing factor in KSI on local roads.

6.8.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	1	1
12 to 16	0	1	1
17 to 20	2	0	0
21 to 24	1	0	1
25 to 29	1	0	0
30 to 39	1	1	1
40 to 49	3	0	1
50 to 59	4	0	0
60 to 69	0	0	0
70+	0	1	0
Unknown	0	0	1
Total	**12**	**4**	**6**

Table 77: KSI by vulnerable road user and age 2003 - 2012

58% of motorcyclists KSI were aged 40 to 59.

6.9 Shire of Dardanup

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 78 displays all crashes in the Shire of Dardanup by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	194	23.5
Intersection	**State, State**	2	0.2
Intersection	**State, LG**	132	16.0
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	317	38.5
Intersection	**LG, LG**	164	19.9
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	15	1.8
Total		**824**	**100.0**

Table 78: All crashes by crash location and road manager 2003 - 2012

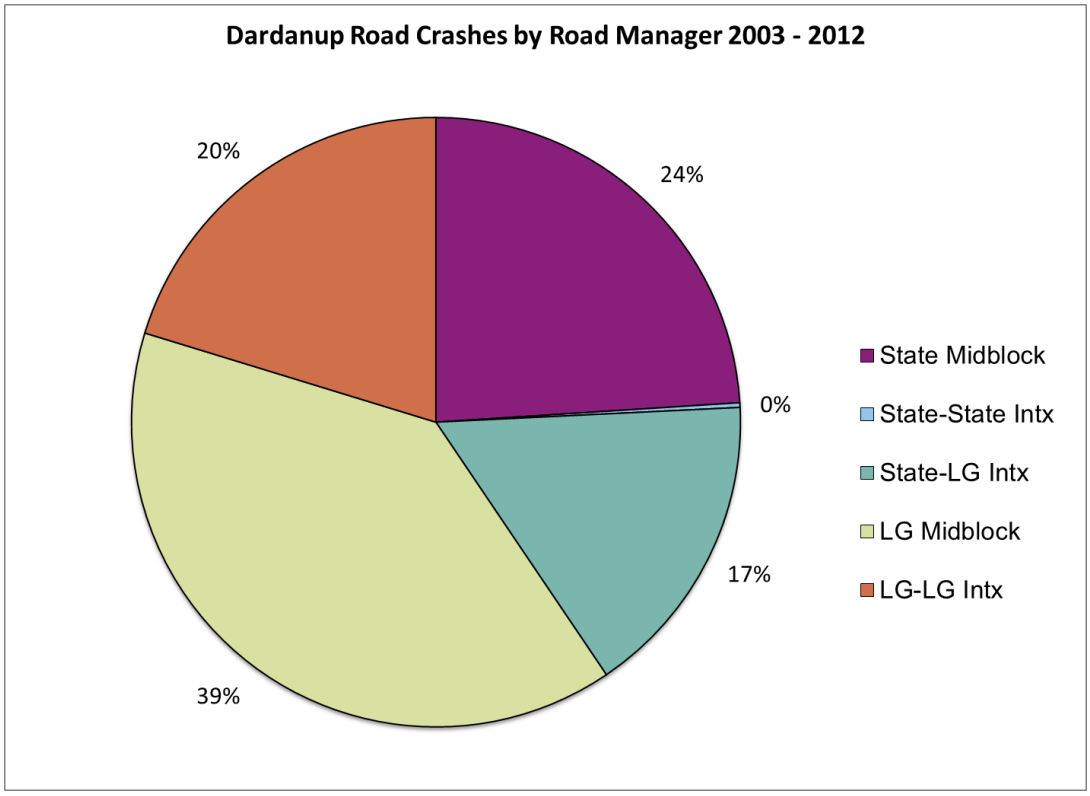

Figure 49: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 49 shows:

- 59% of crashes occurred at local road locations including intersections where all legs were local roads.
- 17% of crashes occurred at intersections having both Local and State road legs.
- 24% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 49 also shows that 63% of crashes in the Shire of Dardanup occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Dardanup local road network from 2003 to 2012 is shown in Table 79.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	6	17	6	4	3	4	3	9	7	16	**75**

Table 79: KSI trend 2003 - 2012

6.9.1 Crash Nature

A summary of KSI by crash nature on the Shire of Dardanup local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 64% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision; and
- 20% of KSI occurred in multi-vehicle crashes of Right Angle or Right Turn Thru crashes.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Dardanup	South West	% for Dardanup	Dardanup
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	2	76	2.6	0
Head On	3	66	4.5	0
Sideswipe	2	43	4.7	0
Right Angle	7	243	2.9	3
Right Turn Thru	8	121	6.6	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***22***	***562***	***3.9***	***3***
Single Vehicle Crashes				
Hit Pedestrian	4	117	3.4	1
Hit Animal	1	9	11.1	0
Hit Object	37	671	5.5	8
Non-Collision	11	179	6.1	4
Single Vehicle Other	0	25	0.0	0
Single Vehicle Total	***53***	***1,001***	***5.3***	***13***
Total	**75**	**1,563**	**4.8**	**16**

Table 80: KSI by crash nature 2003 - 2012

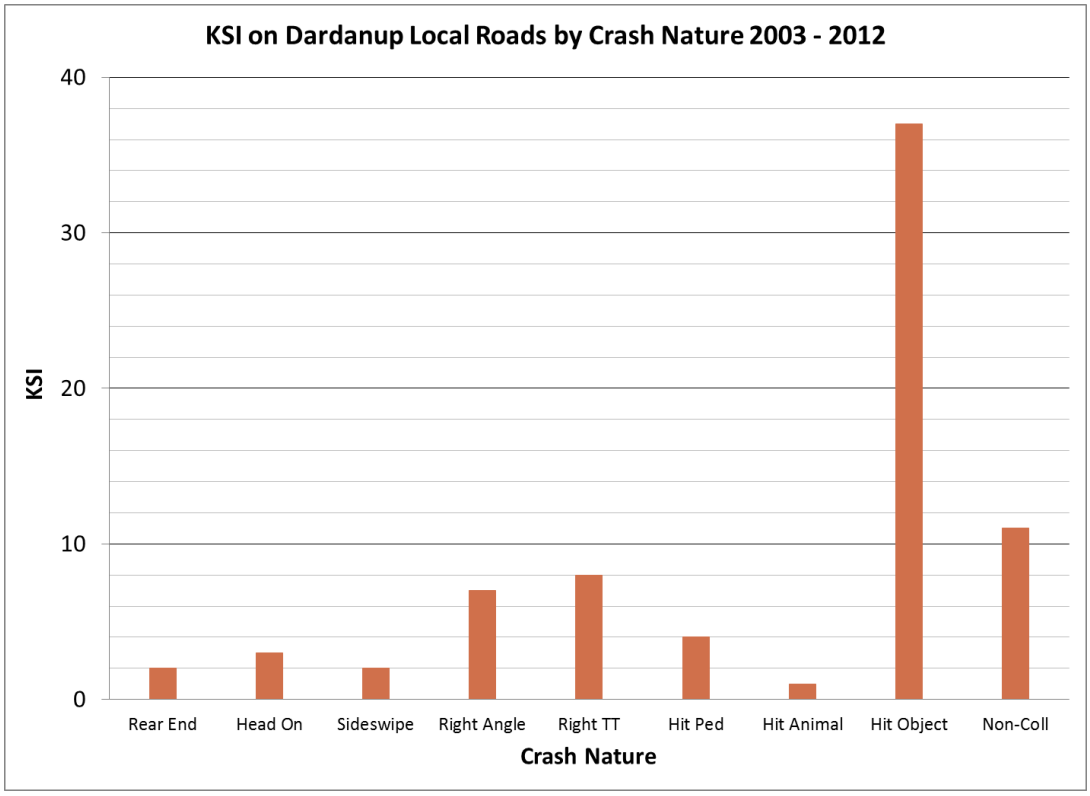

Figure 50: KSI by crash nature 2003 - 2012

6.9.2 Road User Type

KSI by road user type on the Shire of Dardanup local road network from 2003 to 2012 is shown in Table 81 and Figure 51.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	37	58	0	0	95
Passenger	19	25	0	0	44
Motorcyclist	13	3	0	1	17
Bicyclist	3	0	0	0	3
Pedestrian	3	1	0	0	4
Other	0	0	0	0	0
Total	**75**	**87**	**0**	**1**	**163**

Table 81: KSI by road user 2003 - 2012

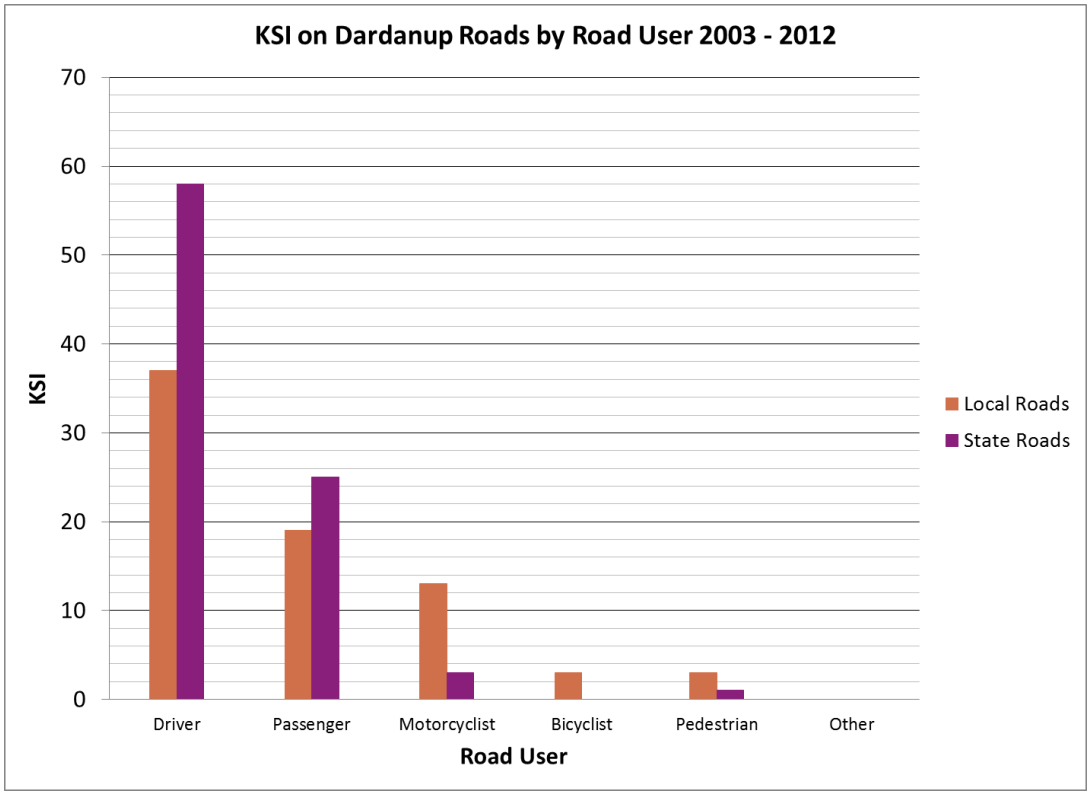

Figure 51: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 75% of KSI on local roads were drivers or passengers, and 17% were motorcyclists. KSI for 2012 is shown in Table 82.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	7	5	0	0	12
Passenger	5	0	0	0	5
Motorcyclist	3	1	0	0	4
Bicyclist	0	0	0	0	0
Pedestrian	1	0	0	0	1
Other	0	0	0	0	0
Total	**16**	**6**	**0**	**0**	**22**

Table 82: KSI by road user 2012

6.9.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Dardanup local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	19	22	0	0	41
Seatbelts Not Worn	4	1	0	0	5
Alcohol	12	8	0	0	20
Speed	18	4	0	0	22

Table 83: KSI by contributing factor 2003 - 2012 (police attended)

Inattention, speed and alcohol are significant contributing factors in KSI on local roads.

6.9.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	1	1	2
12 to 16	0	0	0
17 to 20	0	0	0
21 to 24	1	0	0
25 to 29	3	0	0
30 to 39	5	0	0
40 to 49	3	2	1
50 to 59	0	0	0
60 to 69	0	0	0
70+	0	0	0
Unknown	0	0	0
Total	**13**	**3**	**3**

Table 84: KSI by vulnerable road user and age 2003 - 2012

85% of motorcyclists KSI were aged 25 to 49.

6.10 Shire of Donnybrook-Balingup

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 85 displays all crashes in the Shire of Donnybrook-Balingup by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	286	52.6
Intersection	**State, State**	6	1.1
Intersection	**State, LG**	53	9.7
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	150	27.6
Intersection	**LG, LG**	26	4.8
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	1	0.2
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	22	4.0
Total		**544**	**100.0**

Table 85: All crashes by crash location and road manager 2003 - 2012

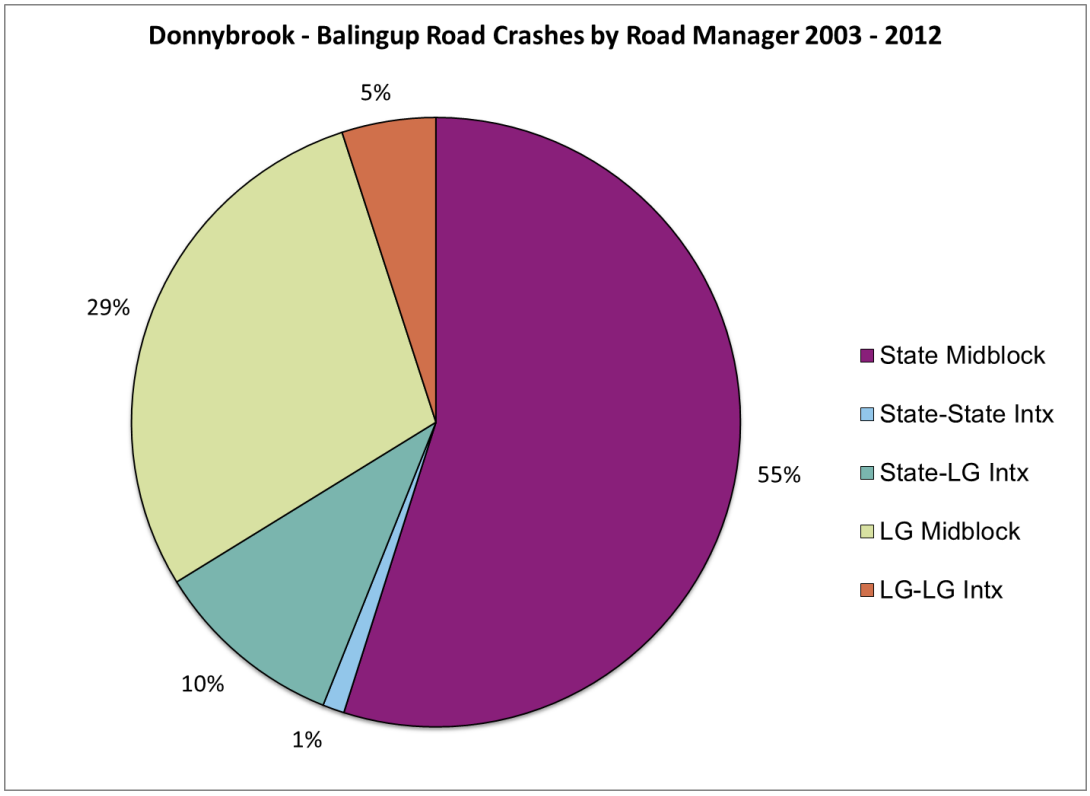

Figure 52: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 52 shows:

- 34% of crashes occurred at local road locations including intersections where all legs were local roads.
- 10% of crashes occurred at intersections having both Local and State road legs.
- 56% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 52 also shows that 84% of crashes in the Shire of Donnybrook-Balingup occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Donnybrook-Balingup local road network from 2003 to 2012 is shown in Table 86.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	0	2	6	0	0	4	9	7	3	5	**36**

Table 86: KSI trend 2003 - 2012

6.10.1 Crash Nature

A summary of KSI by crash nature on the Shire of Donnybrook-Balingup local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 89% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Donnybrook - Balingup	South West	% for Donnybrook - Balingup	Donnybrook - Balingup
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	0	66	0.0	0
Sideswipe	0	43	0.0	0
Right Angle	1	243	0.4	0
Right Turn Thru	2	121	1.7	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***3***	***562***	***0.5***	***0***
Single Vehicle Crashes				
Hit Pedestrian	1	117	0.9	0
Hit Animal	0	9	0.0	0
Hit Object	24	671	3.6	5
Non-Collision	8	179	4.5	0
Single Vehicle Other	0	25	0.0	0
Single Vehicle Total	***33***	***1,001***	***3.3***	***5***
Total	**36**	**1,563**	**2.3**	**5**

Table 87: KSI by crash nature 2003 - 2012

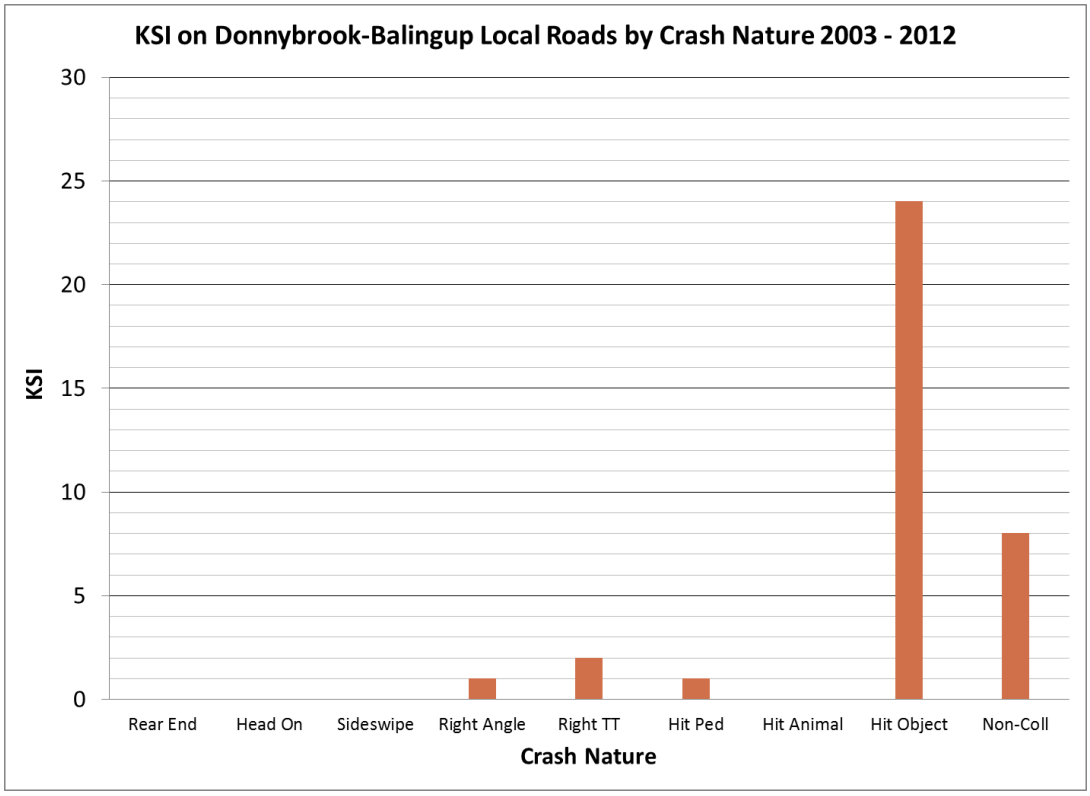

Figure 53: KSI by crash nature 2003 - 2012

6.10.2 Road User Type

KSI by road user type on the Shire of Donnybrook-Balingup local road network from 2003 to 2012 is shown in Table 88 and Figure 54.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	15	48	0	1	64
Passenger	12	25	0	2	39
Motorcyclist	8	9	0	2	19
Bicyclist	0	2	0	0	2
Pedestrian	1	0	0	0	1
Other	0	0	0	0	0
Total	**36**	**84**	**0**	**5**	**125**

Table 88: KSI by road user 2003 - 2012

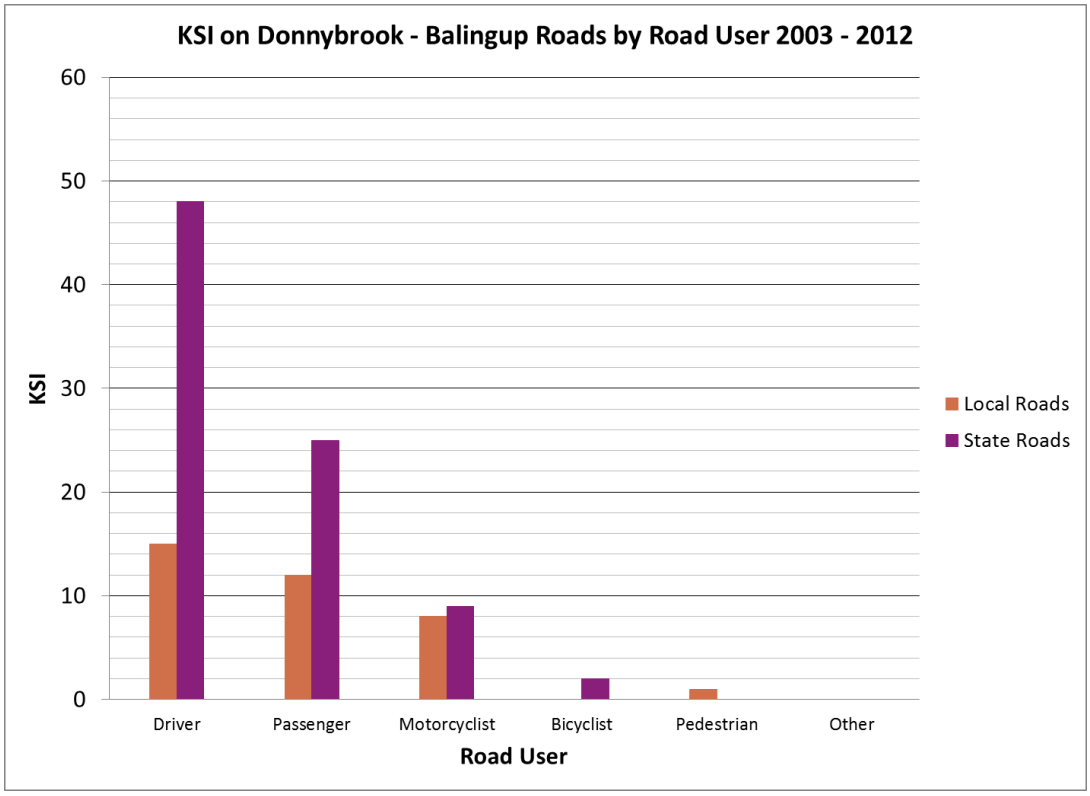

Figure 54: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 75% of KSI on local roads were drivers or passengers, and 22% were motorcyclists. KSI for 2012 is shown in Table 89.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	2	8	0	0	10
Passenger	3	7	0	0	10
Motorcyclist	0	0	0	0	0
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**5**	**15**	**0**	**0**	**20**

Table 89: KSI by road user 2012

6.10.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Donnybrook-Balingup local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	4	9	0	0	13
Seatbelts Not Worn	7	12	0	2	21
Alcohol	5	8	0	1	14
Speed	8	15	0	0	23

Table 90: KSI by contributing factor 2003 - 2012 (police attended)

All factors contributed to KSI on local roads.

6.10.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	1	0	1
17 to 20	0	0	0
21 to 24	0	0	0
25 to 29	1	0	0
30 to 39	1	0	0
40 to 49	3	0	0
50 to 59	0	0	0
60 to 69	1	0	0
70+	1	0	0
Unknown	0	0	0
Total	**8**	**0**	**1**

Table 91: KSI by vulnerable road user and age 2003 - 2012

50% of motorcyclists KSI were aged 30 to 49.

6.11 Shire of Harvey

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 92 displays all crashes in the Shire of Harvey by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	625	30.6
Intersection	**State, State**	98	4.8
Intersection	**State, LG**	194	9.5
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	786	38.4
Intersection	**LG, LG**	298	14.6
Intersection	**LG, Other**	14	0.7
Midblock	**Other**	1	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	29	1.4
Total		**2,045**	**100.0**

Table 92: All crashes by crash location and road manager 2003 - 2012

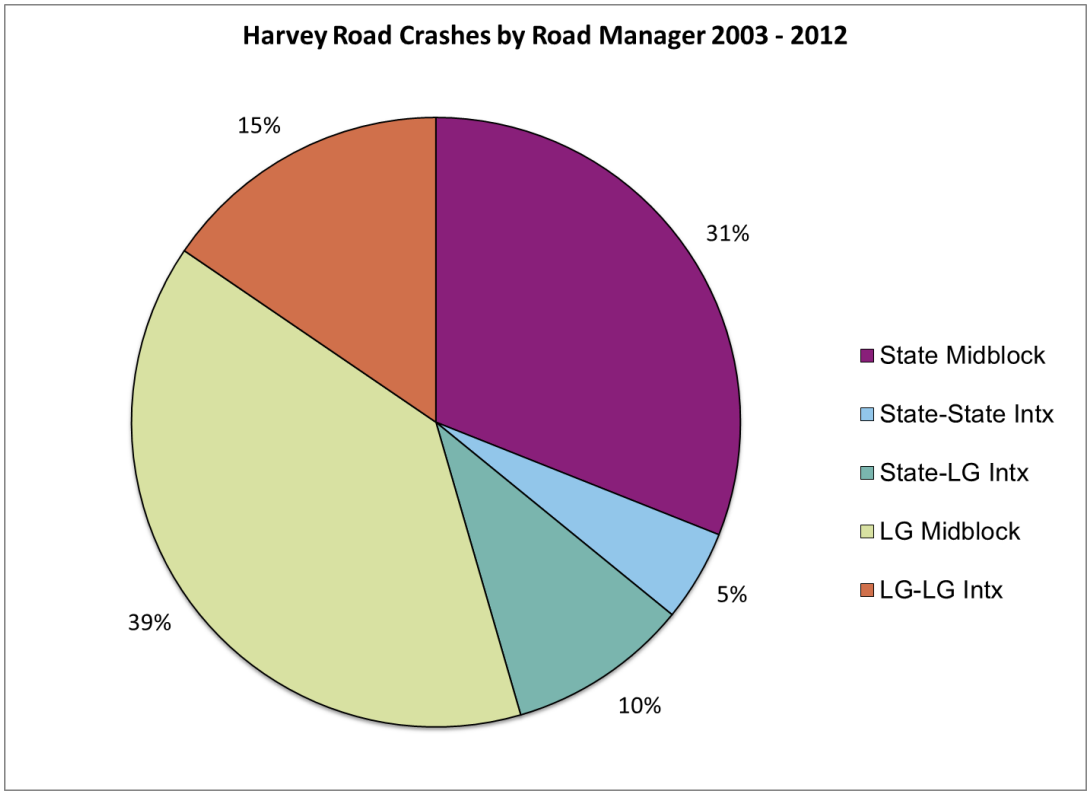

Figure 55: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 55 shows:

- 54% of crashes occurred at local road locations including intersections where all legs were local roads.
- 10% of crashes occurred at intersections having both Local and State road legs.
- 36% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 55 also shows that 70% of crashes in the Shire of Harvey occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Harvey local road network from 2003 to 2012 is shown in Table 93.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	8	17	12	19	5	22	11	14	6	22	**136**

Table 93: KSI trend 2003 - 2012

The ten year KSI trend for the Shire of Harvey is increasing.

6.11.1 Crash Nature

A summary of KSI by crash nature on the Shire of Harvey local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 61% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision;
- 21% of KSI occurred in multi-vehicle crashes of Right Angle or Right Turn Thru ; and
- 8% of KSI occurred in Head On crashes.

Crash Nature	**Local Government and Region**			
	2003 - 2012			**2012**
	Harvey	**South West**	**% for Harvey**	**Harvey**
	n	**n**	**%**	**n**
Multi-Vehicle Crashes				
Rear End	4	76	5.3	2
Head On	11	66	16.7	1
Sideswipe	2	43	4.7	0
Right Angle	20	243	8.2	5
Right Turn Thru	8	121	6.6	4
Multi-Vehicle Other	2	13	15.4	0
Multi-Vehicle Total	***47***	***562***	***8.4***	***12***
Single Vehicle Crashes				
Hit Pedestrian	3	117	2.6	1
Hit Animal	1	9	11.1	0
Hit Object	69	671	10.3	4
Non-Collision	14	179	7.8	5
Single Vehicle Other	2	25	8.0	0
Single Vehicle Total	***89***	***1,001***	***8.9***	***10***
Total	**136**	**1,563**	**8.7**	**22**

Table 94: KSI by crash nature 2003 - 2012

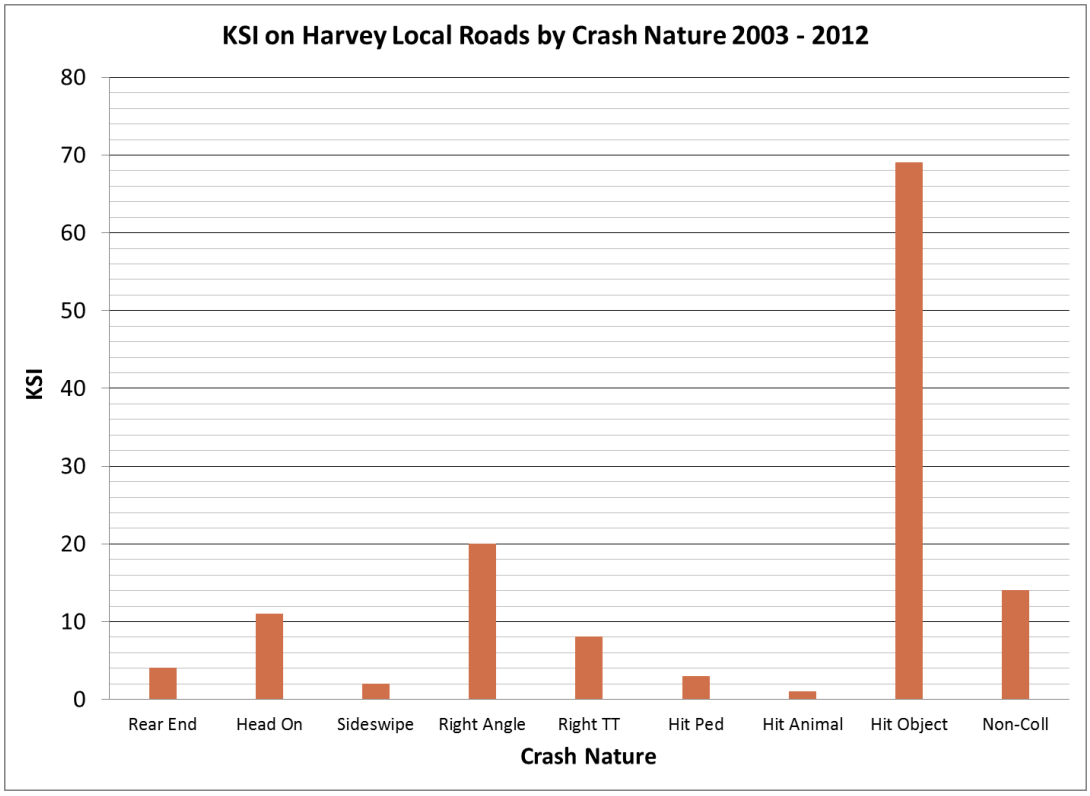

Figure 56: KSI by crash nature 2003 - 2012

6.11.2 Road User Type

KSI by road user type on the Shire of Harvey local road network from 2003 to 2012 is shown in Table 95 and Figure 57.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	73	148	0	0	221
Passenger	46	54	0	2	102
Motorcyclist	10	14	0	2	26
Bicyclist	3	1	0	0	4
Pedestrian	3	3	0	0	6
Other	1	2	0	0	3
Total	**136**	**222**	**0**	**4**	**362**

Table 95: KSI by road user 2003 - 2012

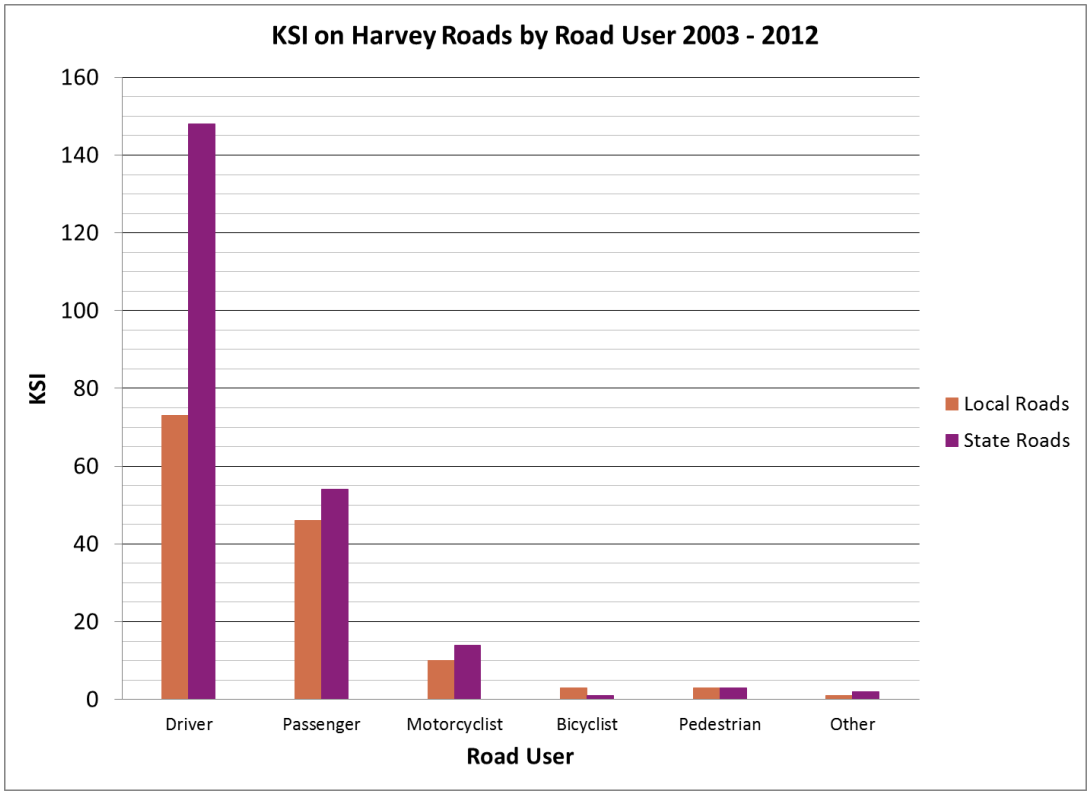

Figure 57: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 88% of KSI on local roads were drivers or passengers, and 7% were motorcyclists. KSI for 2012 is shown in Table 96.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	11	15	0	0	26
Passenger	8	4	0	0	12
Motorcyclist	1	2	0	0	3
Bicyclist	1	0	0	0	1
Pedestrian	1	1	0	0	2
Other	0	0	0	0	0
Total	**22**	**22**	**0**	**0**	**44**

Table 96: KSI by road user 2012

6.11.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Harvey local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	25	58	0	0	83
Seatbelts Not Worn	10	8	0	2	20
Alcohol	13	14	0	0	27
Speed	33	20	0	1	54

Table 97: KSI by contributing factor 2003 - 2012 (police attended)

Speed and inattention were dominant contributing factors in KSI on local roads.

6.11.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	1
12 to 16	0	1	0
17 to 20	2	0	1
21 to 24	1	0	0
25 to 29	0	0	0
30 to 39	2	0	1
40 to 49	3	0	0
50 to 59	1	1	0
60 to 69	0	0	0
70+	0	1	0
Unknown	1	0	0
Total	**10**	**3**	**3**

Table 98: KSI by vulnerable road user and age 2003 - 2012

50% of motorcyclists KSI were aged 30 to 49.

6.12 City of Mandurah

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 99 displays all crashes in the City of Mandurah by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	1,076	12.5
Intersection	**State, State**	31	0.4
Intersection	**State, LG**	2,559	29.7
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	4	0.0
Midblock	**LG**	2,495	29.0
Intersection	**LG, LG**	2,281	26.5
Intersection	**LG, Other**	6	0.1
Midblock	**Other**	2	0.0
Intersection	**Other, Other**	1	0.0
Other	**Unknown**	162	1.9
Total		**8,617**	**100.0**

Table 99: All crashes by crash location and road manager 2003 - 2012

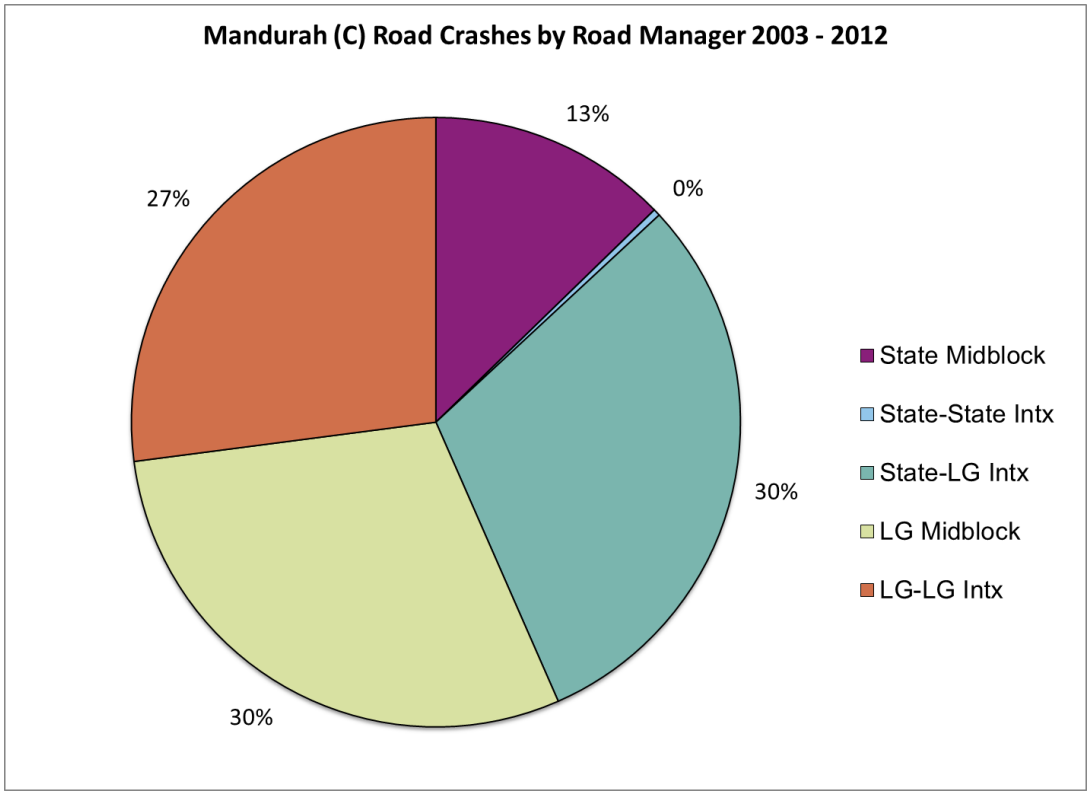

Figure 58: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 58 shows:

- 57% of crashes occurred at local road locations including intersections where all legs were local roads.
- 30% of crashes occurred at intersections having both Local and State road legs.
- 13% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 58 also shows that 57% of crashes in the City of Mandurah occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the City of Mandurah local road network from 2003 to 2012 is shown in Table 100.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	25	26	32	36	43	34	19	38	47	33	**333**

Table 100: KSI trend 2003 - 2012

The ten year KSI trend for the City of Mandurah is increasing.

6.12.1 Crash Nature

A summary of KSI by crash nature on the City of Mandurah local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 35% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision;
- 34% of KSI occurred in multi-vehicle crashes of Right Angle and Right Turn Thru ; and
- 12% of KSI occurred in Hit Pedestrian crashes.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Mandurah	South West	% for Mandurah	Mandurah
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	30	76	39.5	4
Head On	7	66	10.6	1
Sideswipe	16	43	37.2	0
Right Angle	75	243	30.9	7
Right Turn Thru	37	121	30.6	0
Multi-Vehicle Other	3	13	23.1	1
Multi-Vehicle Total	***168***	***562***	***29.9***	***13***
Single Vehicle Crashes				
Hit Pedestrian	40	117	34.2	0
Hit Animal	0	9	0.0	0
Hit Object	94	671	14.0	15
Non-Collision	22	179	12.3	3
Single Vehicle Other	9	25	36.0	2
Single Vehicle Total	***165***	***1,001***	***16.5***	***20***
Total	**333**	**1,563**	**21.3**	**33**

Table 101: KSI by crash nature 2003 - 2012

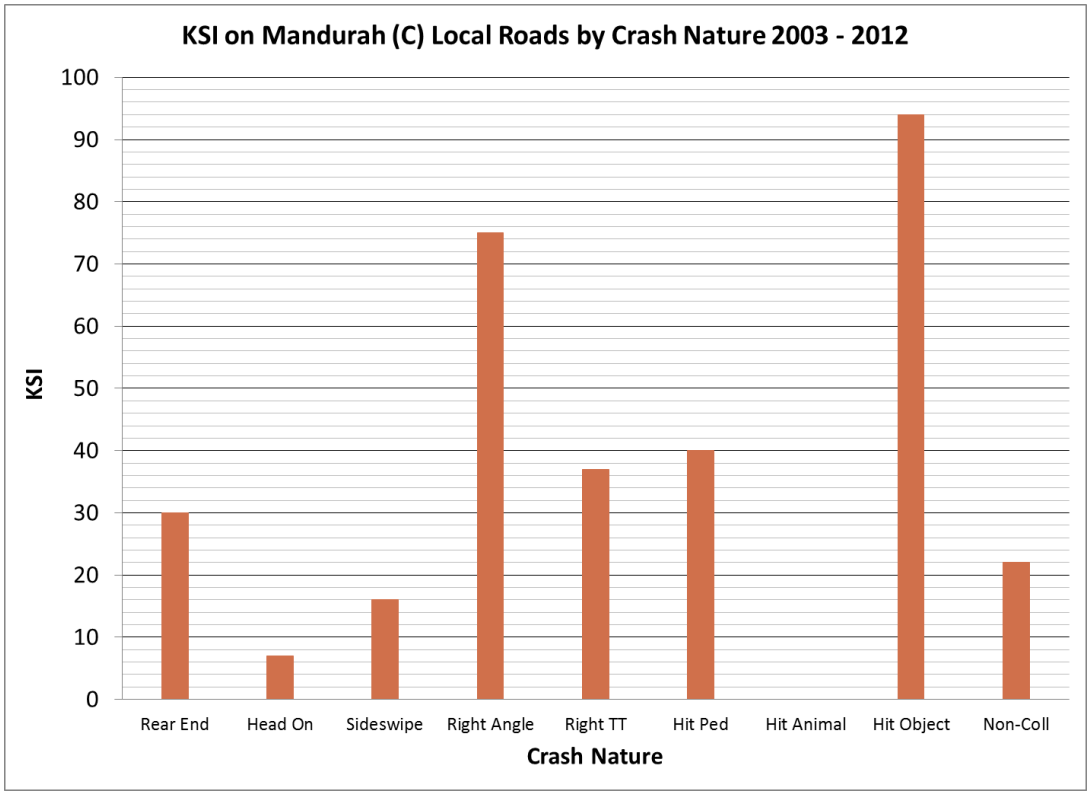

Figure 59: KSI by crash nature 2003 - 2012

6.12.2 Road User Type

KSI by road user type on the City of Mandurah local road network from 2003 to 2012 is shown in Table 102 and Figure 60.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	133	162	0	3	298
Passenger	83	79	0	1	163
Motorcyclist	61	19	0	3	83
Bicyclist	14	10	0	1	25
Pedestrian	40	21	0	2	63
Other	2	1	0	0	3
Total	**333**	**292**	**0**	**10**	**635**

Table 102: KSI by road user 2003 - 2012

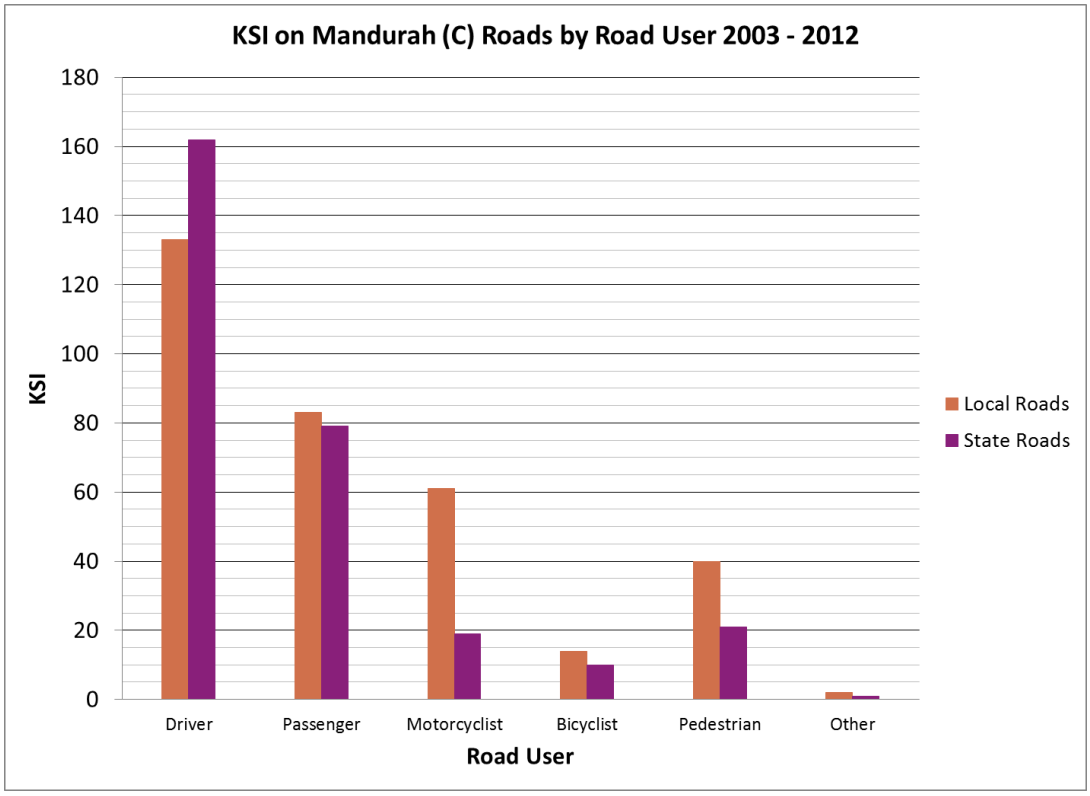

Figure 60: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 35% of KSI on local roads were vulnerable road users defined as motorcyclists, bicyclists or pedestrians. KSI for 2012 is shown in Table 103.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	12	10	0	0	22
Passenger	9	2	0	0	11
Motorcyclist	10	5	0	1	16
Bicyclist	1	3	0	0	4
Pedestrian	1	2	0	0	3
Other	0	0	0	0	0
Total	**33**	**22**	**0**	**1**	**56**

Table 103: KSI by road user 2012

6.12.3 Road User Behaviour

The following table shows factors contributing to KSI on the City of Mandurah local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	59	58	0	1	118
Seatbelts Not Worn	16	9	0	0	25
Alcohol	42	20	0	3	65
Speed	67	27	0	1	95

Table 104: KSI by contributing factor 2003 - 2012 (police attended)

Speed, inattention and alcohol are dominant contributing factors in KSI on local roads.

6.12.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	2	8
12 to 16	7	5	5
17 to 20	11	0	5
21 to 24	6	1	3
25 to 29	10	0	0
30 to 39	8	3	2
40 to 49	10	2	5
50 to 59	4	0	1
60 to 69	2	1	2
70+	0	0	6
Unknown	3	0	3
Total	**61**	**14**	**40**

Table 105: KSI by vulnerable road user and age 2003 - 2012

Table 105 shows:

- 11% of motorcyclists KSI were aged 12 to 16; and 29% aged 17 to 24;
- 50% of bicyclists KSI were aged 16 or younger; and
- 32% of pedestrians KSI were aged 16 or younger.

6.13 Shire of Manjimup

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 106 displays all crashes in the Shire of Manjimup by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	334	30.7
Intersection	**State, State**	3	0.3
Intersection	**State, LG**	59	5.4
Intersection	**State, LG, Other**	1	0.1
Intersection	**State, Other**	0	0.0
Midblock	**LG**	518	47.7
Intersection	**LG, LG**	100	9.2
Intersection	**LG, Other**	1	0.1
Midblock	**Other**	18	1.7
Intersection	**Other, Other**	1	0.1
Other	**Unknown**	52	4.8
Total		**1,087**	**100.0**

Table 106: All crashes by crash location and road manager 2003 - 2012

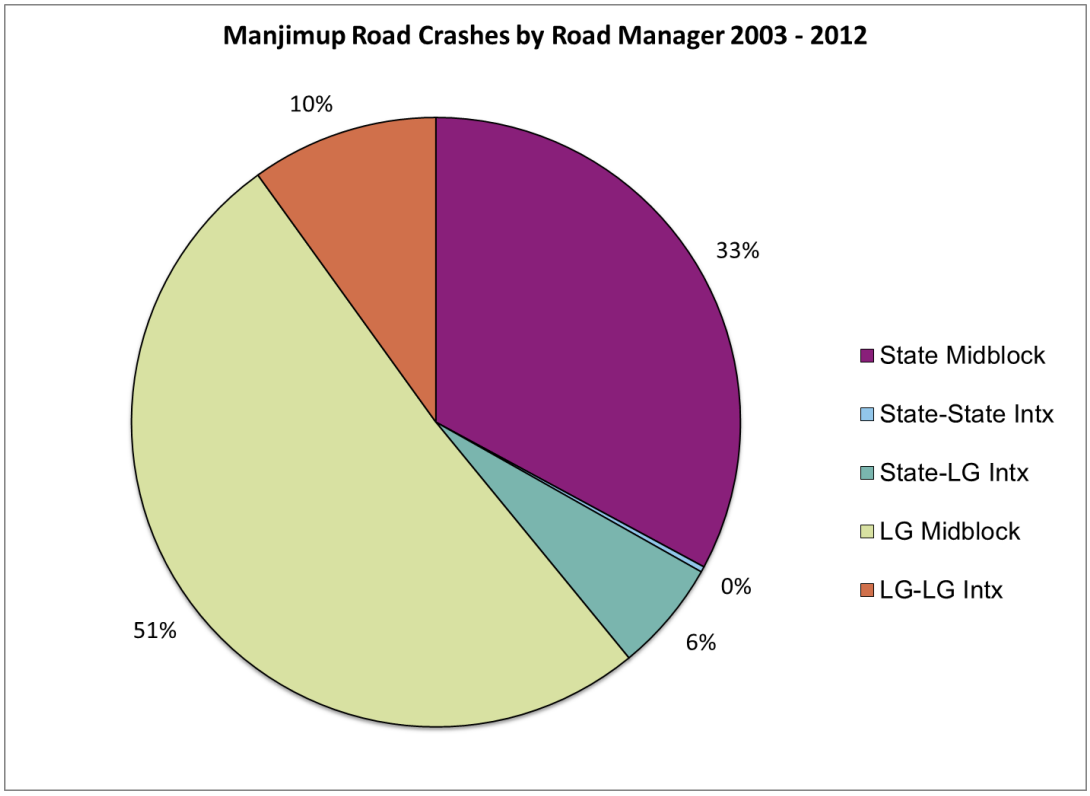

Figure 61: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 61 shows:

- 61% of crashes occurred at local road locations including intersections where all legs were local roads.
- 6% of crashes occurred at intersections having both Local and State road legs.
- 33% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 61 also shows that 84% of crashes in the Shire of Manjimup occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Manjimup local road network from 2003 to 2012 is shown in Table 107.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	10	2	12	18	3	7	15	13	3	7	**90**

Table 107: KSI trend 2003 - 2012

6.13.1 Crash Nature

A summary of KSI by crash nature on the Shire of Manjimup local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 79% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision; and
- 11% of KSI occurred in multi-vehicle crashes of Right Angle or Right Turn Thru crashes.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Manjimup	South West	% for Manjimup	Manjimup
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	4	66	6.1	0
Sideswipe	0	43	0.0	0
Right Angle	8	243	3.3	1
Right Turn Thru	2	121	1.7	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***14***	***562***	***2.5***	***1***
Single Vehicle Crashes				
Hit Pedestrian	3	117	2.6	1
Hit Animal	0	9	0.0	0
Hit Object	60	671	8.9	4
Non-Collision	11	179	6.1	1
Single Vehicle Other	2	25	8.0	0
Single Vehicle Total	***76***	***1,001***	***7.6***	***6***
Total	**90**	**1,563**	**5.8**	**7**

Table 108: KSI by crash nature 2003 - 2012

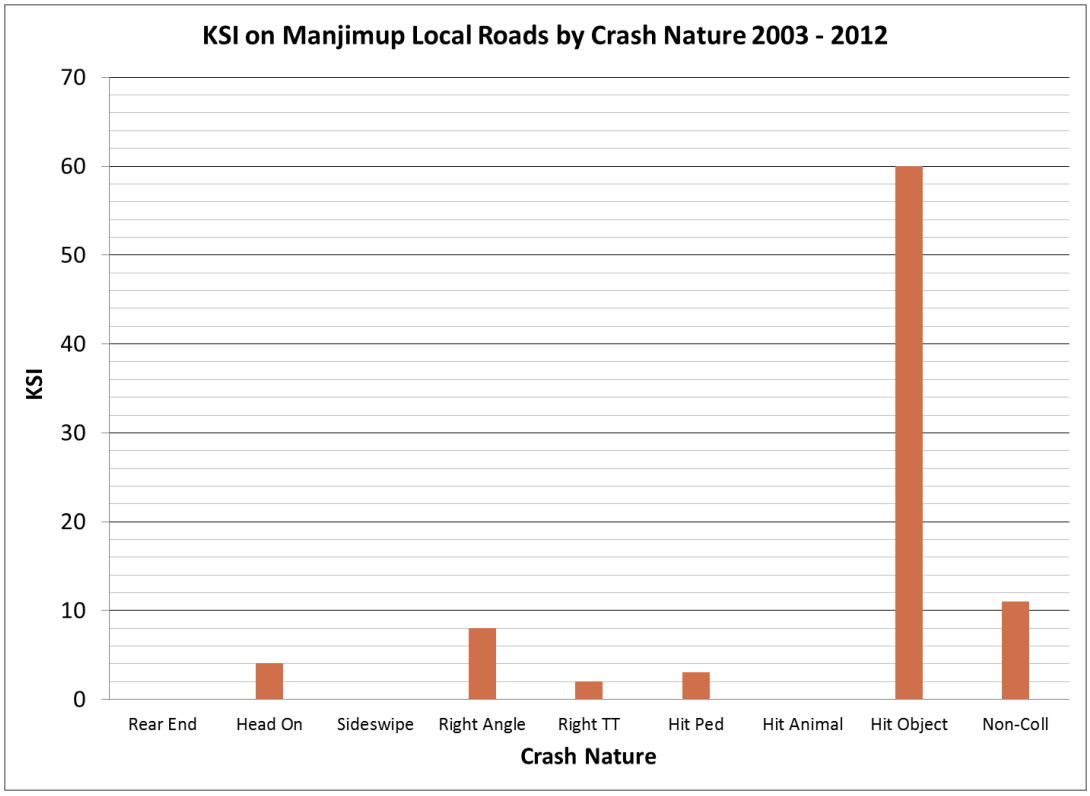

Figure 62: KSI by crash nature 2003 - 2012

6.13.2 Road User Type

KSI by road user type on the Shire of Manjimup local road network from 2003 to 2012 is shown in Table 109 and Figure 63.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	47	57	2	3	109
Passenger	28	73	2	4	107
Motorcyclist	12	10	0	2	24
Bicyclist	0	0	0	0	0
Pedestrian	3	0	0	0	3
Other	0	1	0	0	1
Total	**90**	**141**	**4**	**9**	**244**

Table 109: KSI by road user 2003 - 2012

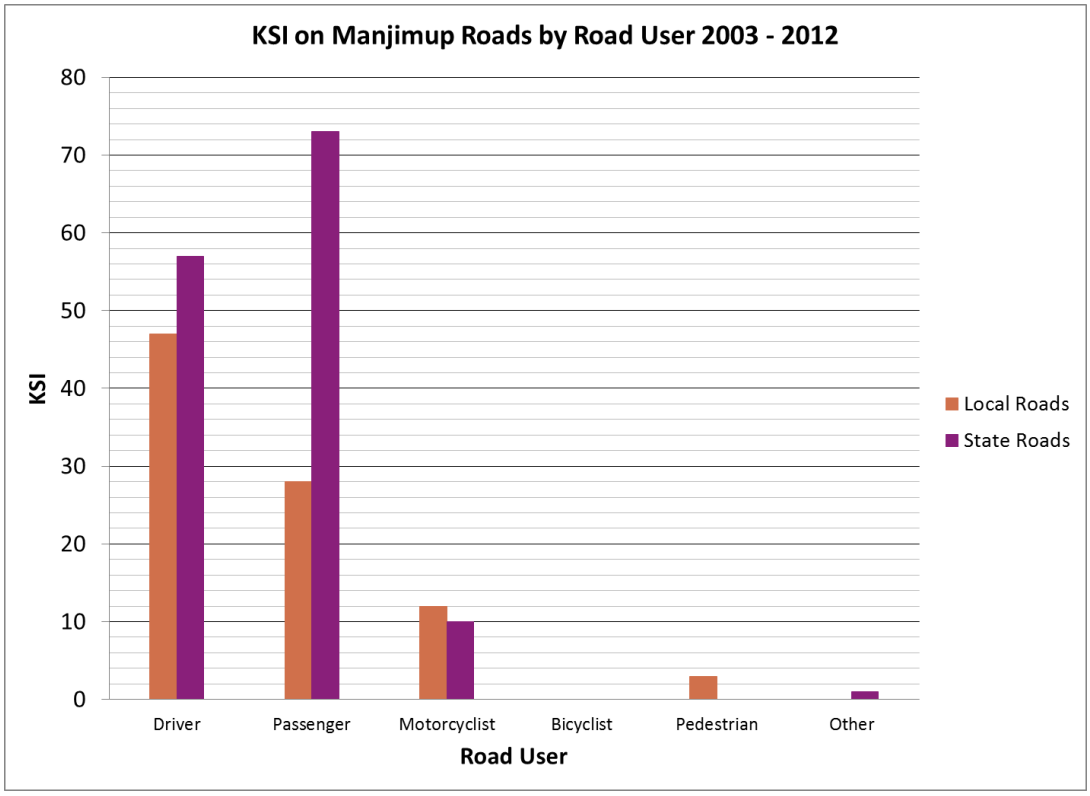

Figure 63: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 83% of KSI on local roads were drivers or passengers, and 13% were motorcyclists. KSI for 2012 is shown in Table 110.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	3	5	0	0	8
Passenger	2	4	0	0	6
Motorcyclist	1	0	0	0	1
Bicyclist	0	0	0	0	0
Pedestrian	1	0	0	0	1
Other	0	0	0	0	0
Total	**7**	**9**	**0**	**0**	**16**

Table 110: KSI by road user 2012

6.13.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Manjimup local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	8	64	2	0	74
Seatbelts Not Worn	12	12	0	0	24
Alcohol	12	9	0	2	23
Speed	25	15	0	0	40

Table 111: KSI by contributing factor 2003 - 2012 (police attended)

Speed is the dominant contributing factor in KSI on local roads.

6.13.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	2	0	1
12 to 16	1	0	0
17 to 20	2	0	0
21 to 24	2	0	0
25 to 29	1	0	0
30 to 39	2	0	1
40 to 49	2	0	0
50 to 59	0	0	0
60 to 69	0	0	0
70+	0	0	1
Unknown	0	0	0
Total	**12**	**0**	**3**

Table 112: KSI by vulnerable road user and age 2003 – 2012

6.14 Shire of Murray

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 113 displays all crashes in the Shire of Murray by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	606	37.7
Intersection	**State, State**	45	2.8
Intersection	**State, LG**	255	15.9
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	533	33.2
Intersection	**LG, LG**	127	7.9
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	1	0.1
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	40	2.5
Total		**1,607**	**100.0**

Table 113: All crashes by crash location and road manager 2003 - 2012

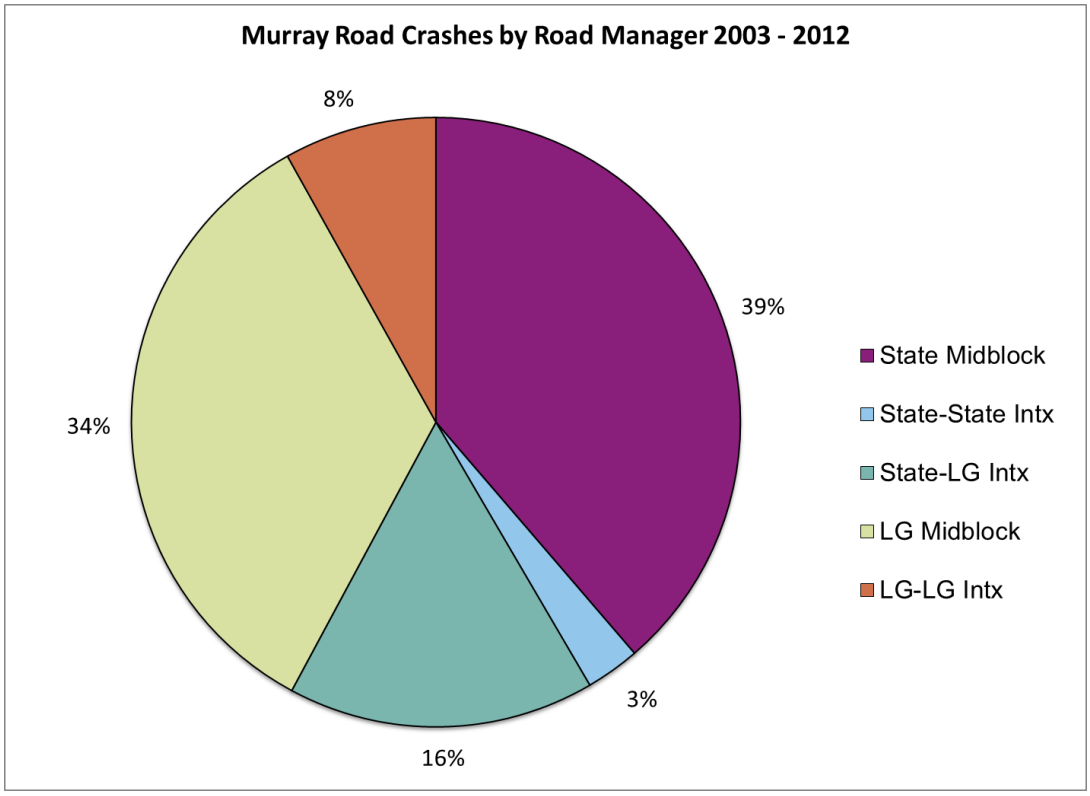

Figure 64: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 64 shows:

- 42% of crashes occurred at local road locations including intersections where all legs were local roads.
- 16% of crashes occurred at intersections having both Local and State road legs.
- 42% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 64 also shows that 73% of crashes in the Shire of Murray occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Murray local road network from 2003 to 2012 is shown in Table 114.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	11	10	11	10	20	16	11	13	3	9	**114**

Table 114: KSI trend 2003 - 2012

6.14.1 Crash Nature

A summary of KSI by crash nature on the Shire of Murray local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 73% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision; and
- 12% of KSI occurred in multi-vehicle crashes of Right Angle or Right Turn Thru crashes.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Murray	South West	% for Murray	Murray
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	1	76	1.3	0
Head On	7	66	10.6	0
Sideswipe	3	43	7.0	0
Right Angle	11	243	4.5	0
Right Turn Thru	3	121	2.5	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***25***	***562***	***4.4***	***0***
Single Vehicle Crashes				
Hit Pedestrian	1	117	0.9	0
Hit Animal	2	9	22.2	0
Hit Object	65	671	9.7	8
Non-Collision	19	179	10.6	1
Single Vehicle Other	2	25	8.0	0
Single Vehicle Total	***89***	***1,001***	***8.9***	***9***
Total	**114**	**1,563**	**7.3**	**9**

Table 115: KSI by crash nature 2003 - 2012

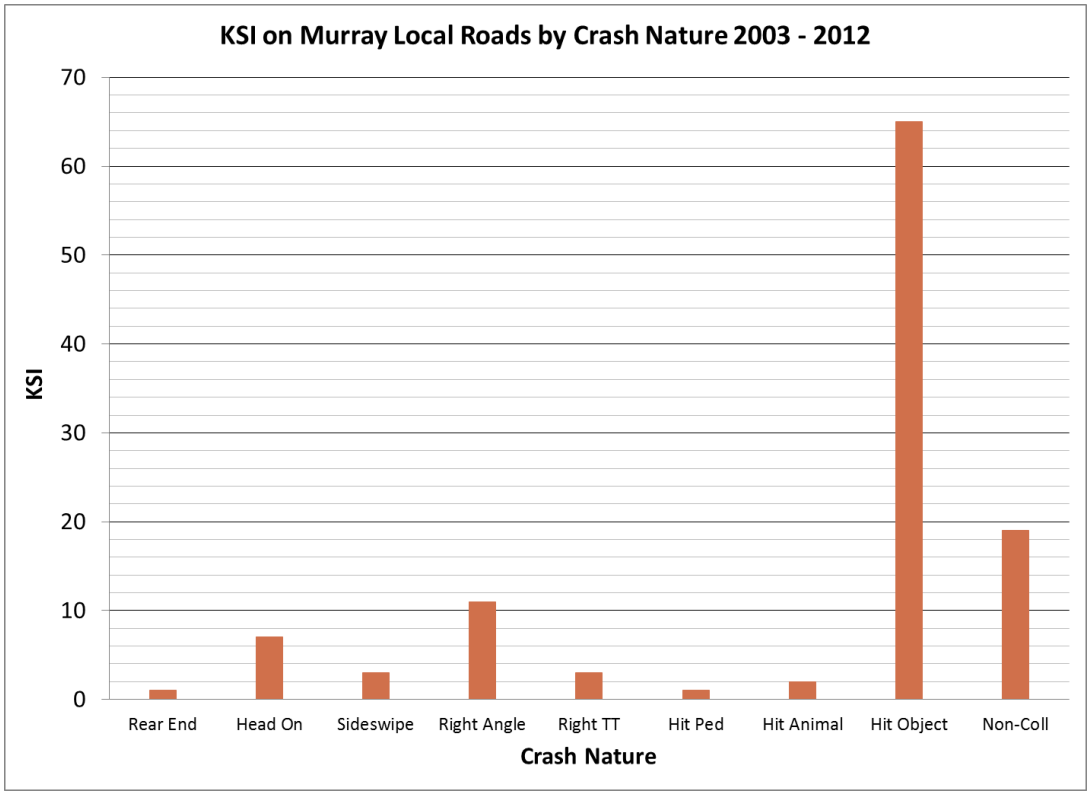

Figure 65: KSI by crash nature 2003 - 2012

6.14.2 Road User Type

KSI by road user type on the Shire of Murray local road network from 2003 to 2012 is shown in Table 116 and Figure 66.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	59	87	0	2	148
Passenger	30	54	0	1	85
Motorcyclist	24	24	0	1	49
Bicyclist	0	3	0	0	3
Pedestrian	1	11	0	0	12
Other	0	1	0	0	1
Total	**114**	**180**	**0**	**4**	**298**

Table 116: KSI by road user 2003 - 2012

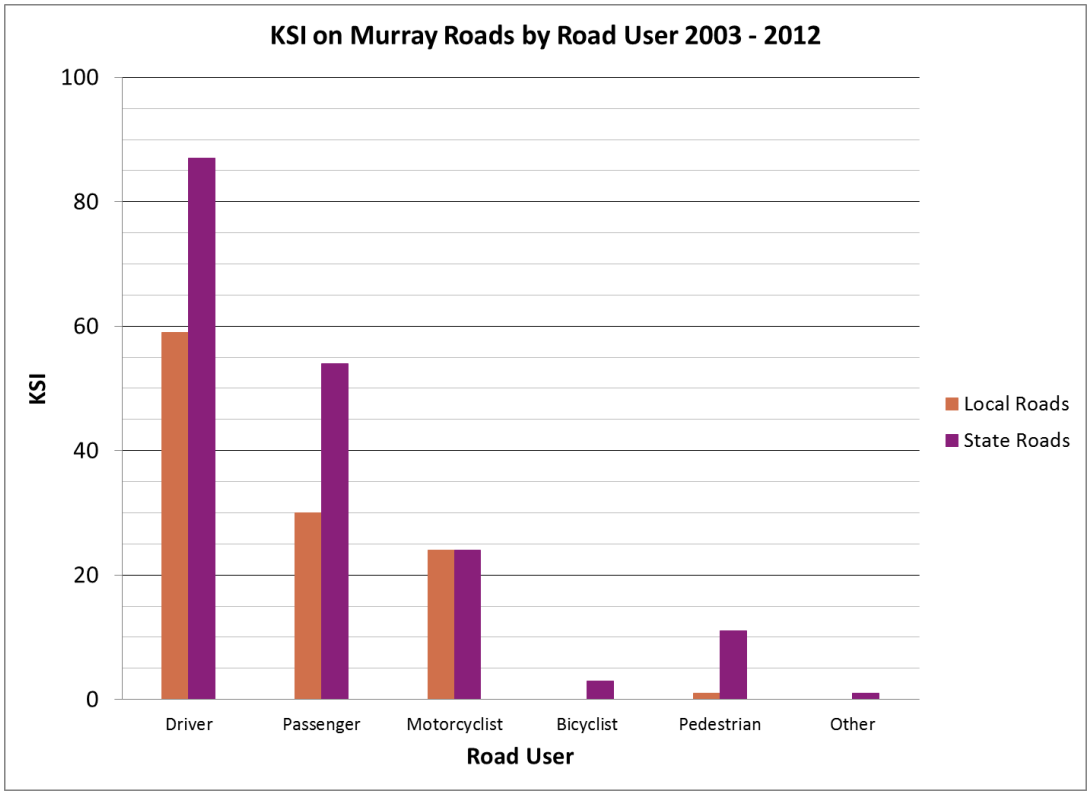

Figure 66: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 78% of KSI on local roads were drivers or passengers, and 21% were motorcyclists. KSI for 2012 is shown in Table 117.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	5	7	0	0	12
Passenger	3	7	0	0	10
Motorcyclist	1	3	0	0	4
Bicyclist	0	0	0	0	0
Pedestrian	0	1	0	0	1
Other	0	0	0	0	0
Total	**9**	**18**	**0**	**0**	**27**

Table 117: KSI by road user 2012

6.14.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Murray local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	26	45	0	0	71
Seatbelts Not Worn	8	14	0	0	22
Alcohol	11	11	0	0	22
Speed	28	14	0	2	44

Table 118: KSI by contributing factor 2003 - 2012 (police attended)

Inattention and speed are dominant contributing factors in KSI on local roads, which is consistent with the Hit Object and Non-Collision crash natures identified previously.

6.14.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	0	0
17 to 20	1	0	0
21 to 24	4	0	0
25 to 29	5	0	0
30 to 39	5	0	0
40 to 49	7	0	0
50 to 59	1	0	0
60 to 69	1	0	0
70+	0	0	1
Unknown	0	0	0
Total	**24**	**0**	**1**

Table 119: KSI by vulnerable road user and age 2003 - 2012

71% of motorcyclists KSI were aged 25 to 49.

6.15 Shire of Nannup

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 120 displays all crashes in the Shire of Nannup by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	136	44.4
Intersection	**State, State**	1	0.3
Intersection	**State, LG**	9	2.9
Intersection	**State, LG, Other**	0	0.0
Intersection	**State, Other**	0	0.0
Midblock	**LG**	144	47.1
Intersection	**LG, LG**	5	1.6
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	0	0.0
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	11	3.6
Total		**306**	**100.0**

Table 120: All crashes by crash location and road manager 2003 - 2012

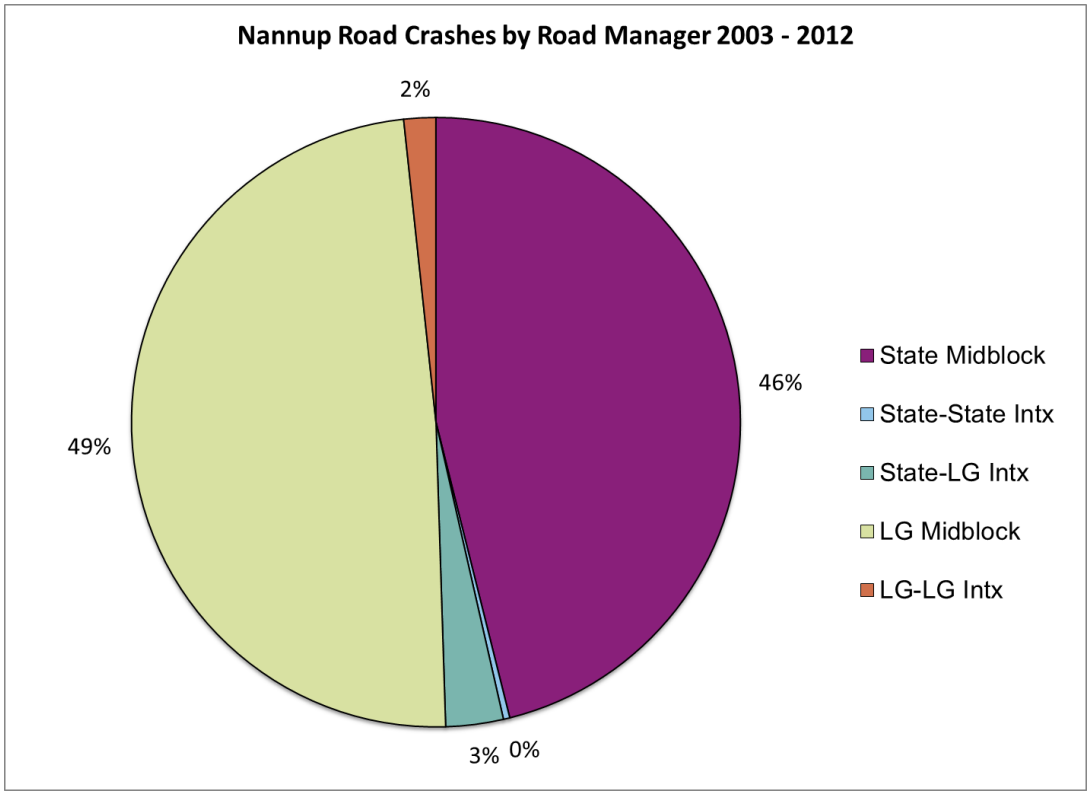

Figure 67: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at "Other" locations, Figure 67 shows:

- 51% of crashes occurred at local road locations including intersections where all legs were local roads.
- 3% of crashes occurred at intersections having both Local and State road legs.
- 46% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 67 also shows that 95% of crashes in the Shire of Nannup occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Nannup local road network from 2003 to 2012 is shown in Table 121.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	5	1	2	5	1	1	2	1	3	5	**26**

Table 121: KSI trend 2003 - 2012

6.15.1 Crash Nature

A summary of KSI by crash nature on the Shire of Nannup local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 77% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Nannup	South West	% for Nannup	Nannup
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	0	76	0.0	0
Head On	0	66	0.0	0
Sideswipe	0	43	0.0	0
Right Angle	1	243	0.4	0
Right Turn Thru	0	121	0.0	0
Multi-Vehicle Other	3	13	23.1	3
Multi-Vehicle Total	***4***	***562***	***0.7***	***3***
Single Vehicle Crashes				
Hit Pedestrian	0	117	0.0	0
Hit Animal	0	9	0.0	0
Hit Object	12	671	1.8	1
Non-Collision	8	179	4.5	1
Single Vehicle Other	2	25	8.0	0
Single Vehicle Total	***22***	***1,001***	***2.2***	***2***
Total	**26**	**1,563**	**1.7**	**5**

Table 122: KSI by crash nature 2003 - 2012

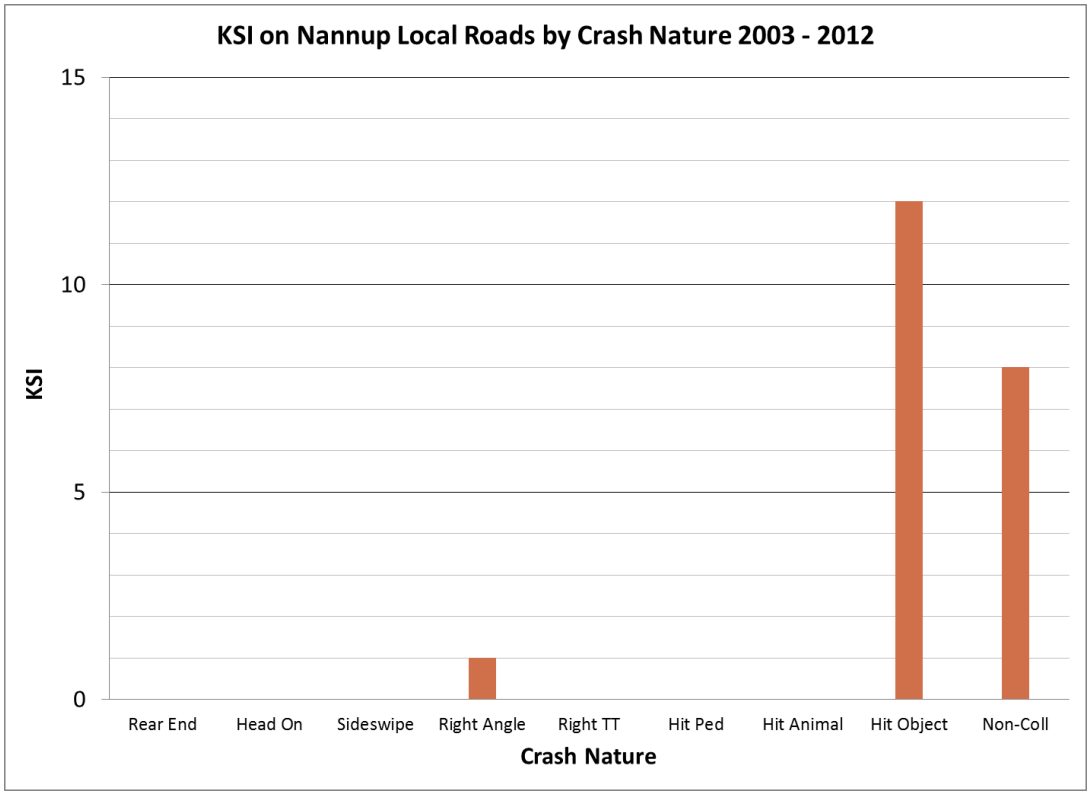

Figure 68: KSI by crash nature 2003 - 2012

6.15.2 Road User Type

KSI by road user type on the Shire of Nannup local road network from 2003 to 2012 is shown in Table 123 and Figure 69.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	12	13	0	0	25
Passenger	6	11	0	0	17
Motorcyclist	8	6	0	4	18
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	1	0	0	1
Total	**26**	**31**	**0**	**4**	**61**

Table 123: KSI by road user 2003 - 2012

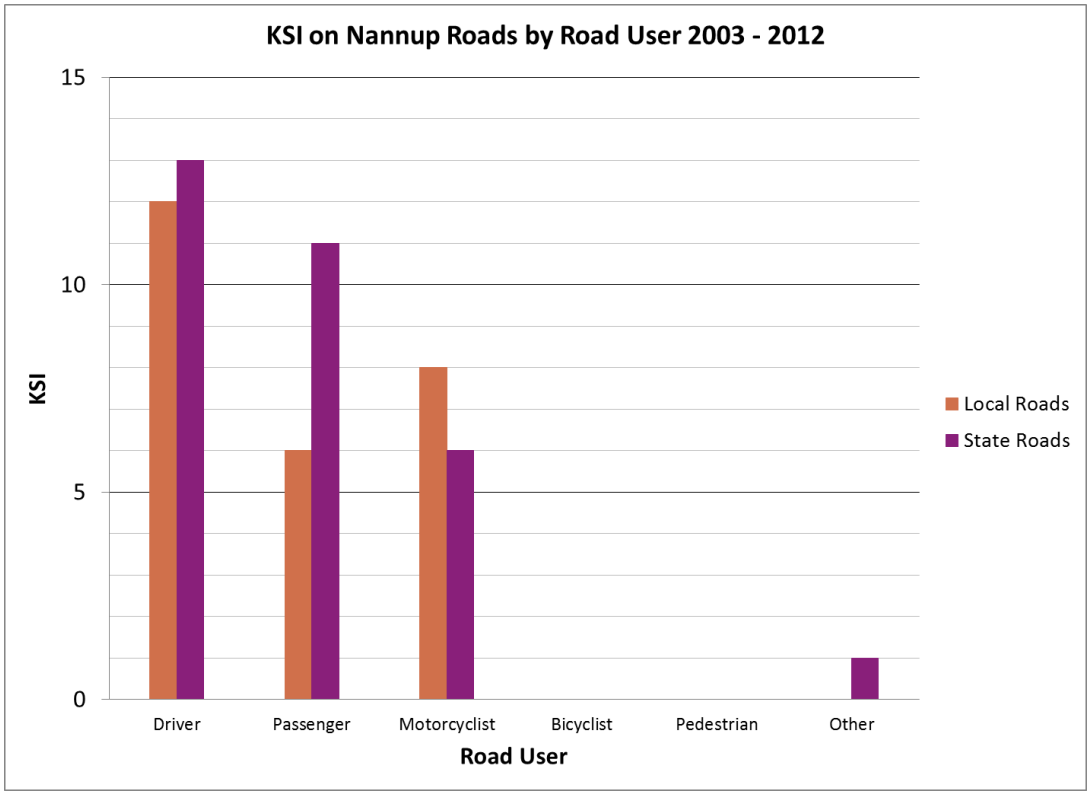

Figure 69: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 69% of KSI on local roads were drivers or passengers, and 31% were motorcyclists. KSI for 2012 is shown in Table 124.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	2	1	0	0	3
Passenger	0	0	0	0	0
Motorcyclist	3	0	0	0	3
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**5**	**1**	**0**	**0**	**6**

Table 124: KSI by road user 2012

6.15.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Nannup local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	4	7	0	0	11
Seatbelts Not Worn	4	3	0	0	7
Alcohol	3	2	0	0	5
Speed	2	4	0	0	6

Table 125: KSI by contributing factor 2003 - 2012 (police attended)

All factors contributed to KSI.

6.15.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	0	0
17 to 20	2	0	0
21 to 24	0	0	0
25 to 29	0	0	0
30 to 39	2	0	0
40 to 49	1	0	0
50 to 59	1	0	0
60 to 69	2	0	0
70+	0	0	0
Unknown	0	0	0
Total	**8**	**0**	**0**

Table 126: KSI by vulnerable road user and age 2003 – 2012

6.16 Shire of Waroona

Refer also to the South West Region Local Road Crash Map Book 2012.

Table 127 displays all crashes in the Shire of Waroona by crash location and road manager from 2003 to 2012.

Crash Location	Road Manager	Crashes	%
Midblock	**State**	231	46.4
Intersection	**State, State**	12	2.4
Intersection	**State, LG**	34	6.8
Intersection	**State, LG, Other**	4	0.8
Intersection	**State, Other**	1	0.2
Midblock	**LG**	169	33.9
Intersection	**LG, LG**	32	6.4
Intersection	**LG, Other**	0	0.0
Midblock	**Other**	3	0.6
Intersection	**Other, Other**	0	0.0
Other	**Unknown**	12	2.4
Total		**498**	**100.0**

Table 127: All crashes by crash location and road manager 2003 - 2012

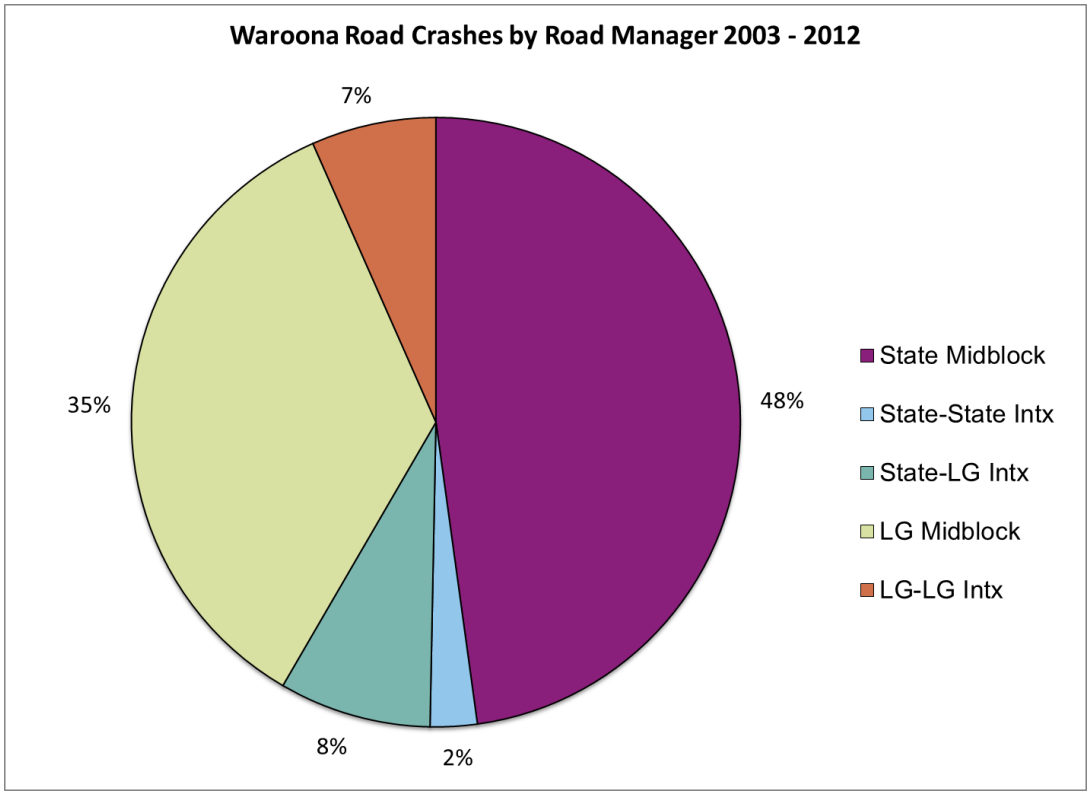

Figure 70: All crashes by crash location and road manager 2003 - 2012

Ignoring crashes at “Other” and “Unknown” locations, Figure 70 shows:

- 42% of crashes occurred at local road locations including intersections where all legs were local roads.
- 8% of crashes occurred at intersections having both Local and State road legs.
- 50% of crashes occurred at State road locations including intersections where all legs were State roads.

Figure 70 also shows that 83% of crashes in the Shire of Waroona occurred at midblock locations on Local and State roads. This is further investigated in the analysis of the crash nature.

The KSI trend for the Shire of Waroona local road network from 2003 to 2012 is shown in Table 128.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
KSI	1	2	3	7	4	5	4	3	1	5	**35**

Table 128: KSI trend 2003 - 2012

6.16.1 Crash Nature

A summary of KSI by crash nature on the Shire of Waroona local road network from 2003 to 2012 is displayed in the table and figure below, which show:

- 91% of KSI occurred in single vehicle crashes of Hit Object or Non-Collision.

Crash Nature	Local Government and Region			
	2003 - 2012			2012
	Waroona	South West	% for Waroona	Waroona
	n	n	%	n
Multi-Vehicle Crashes				
Rear End	1	76	1.3	0
Head On	2	66	3.0	1
Sideswipe	0	43	0.0	0
Right Angle	0	243	0.0	0
Right Turn Thru	0	121	0.0	0
Multi-Vehicle Other	0	13	0.0	0
Multi-Vehicle Total	***3***	***562***	***0.5***	***1***
Single Vehicle Crashes				
Hit Pedestrian	0	117	0.0	0
Hit Animal	0	9	0.0	0
Hit Object	21	671	3.1	3
Non-Collision	11	179	6.1	1
Single Vehicle Other	0	25	0.0	0
Single Vehicle Total	***32***	***1,001***	***3.2***	***4***
Total	**35**	**1,563**	**2.2**	**5**

Table 129: KSI by crash nature 2003 - 2012

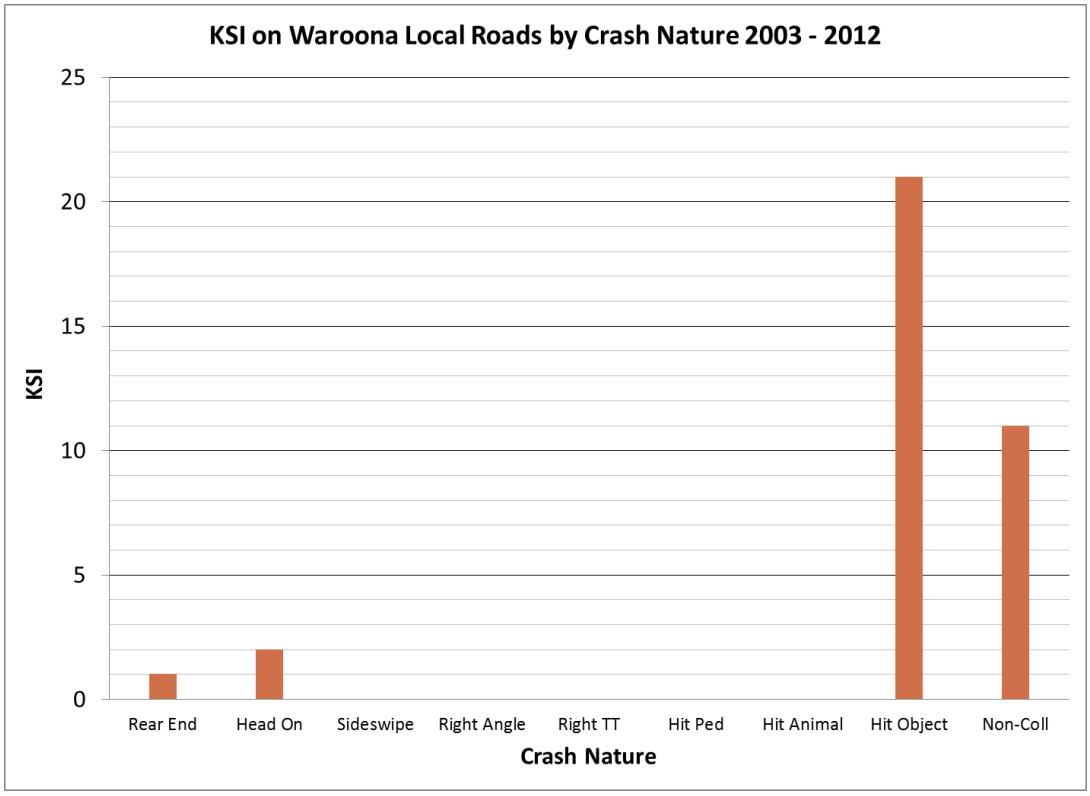

Figure 71: KSI by crash nature 2003 - 2012

6.16.2 Road User Type

KSI by road user type on the Shire of Waroona local road network from 2003 to 2012 is shown in Table 130 and Figure 72.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	12	57	0	3	72
Passenger	6	32	0	1	39
Motorcyclist	17	1	0	2	20
Bicyclist	0	0	0	0	0
Pedestrian	0	2	0	0	2
Other	0	0	0	0	0
Total	**35**	**92**	**0**	**6**	**133**

Table 130: KSI by road user 2003 - 2012

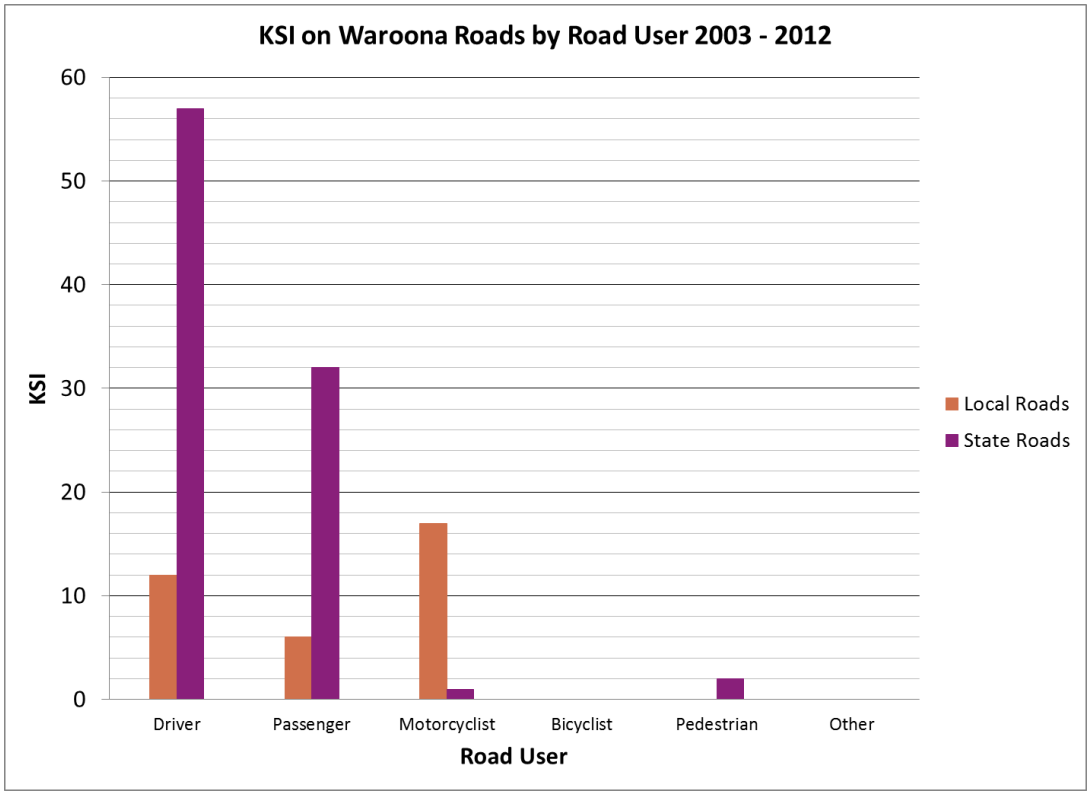

Figure 72: KSI by road user 2003 - 2012

From 2003 to 2012 approximately 51% of KSI on local roads were drivers or passengers, and 49% were motorcyclists. KSI for 2012 is shown in Table 131.

Road User	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Driver	1	8	0	0	9
Passenger	2	2	0	0	4
Motorcyclist	2	0	0	0	2
Bicyclist	0	0	0	0	0
Pedestrian	0	0	0	0	0
Other	0	0	0	0	0
Total	**5**	**10**	**0**	**0**	**15**

Table 131: KSI by road user 2012

6.16.3 Road User Behaviour

The following table shows factors contributing to KSI on the Shire of Waroona local road network. The analysis is restricted to police attended crashes for consistency. Note that the contributing factors are not necessarily mutually exclusive, that is, it is possible that more than one factor contributed to the crash.

Contributing Factor	Road Manager				
	Local	State	Other	Unknown	Total
	n	n	n	n	n
Inattention	8	17	0	3	28
Seatbelts Not Worn	3	5	0	1	9
Alcohol	5	4	0	1	10
Speed	12	11	0	2	25

Table 132: KSI by contributing factor 2003 - 2012 (police attended)

Speed and inattention were the dominant contributing factors in KSI on local roads, which is consistent with the Hit Object and Non-Collision crash natures identified previously.

6.16.4 Vulnerable Road Users

The following table shows vulnerable road user KSI by age on local roads from 2003 to 2012. A vulnerable road user is defined as a motorcyclist, bicyclist or pedestrian.

Age	Vulnerable Road User		
	Motorcyclist	Bicyclist	Pedestrian
	n	n	n
0 to 11	0	0	0
12 to 16	0	0	0
17 to 20	1	0	0
21 to 24	1	0	0
25 to 29	4	0	0
30 to 39	4	0	0
40 to 49	3	0	0
50 to 59	2	0	0
60 to 69	2	0	0
70+	0	0	0
Unknown	0	0	0
Total	**17**	**0**	**0**

Table 133: KSI by vulnerable road user and age 2003 - 2012

47% of motorcyclists KSI were aged 25 to 39.

GLOSSARY

ARIA: (Accessibility Remoteness Index of Australia). A geographical measure of remoteness defined by the University of Adelaide.

BAC: Blood alcohol concentration measured as grams of alcohol per 100mL of blood. A BAC of 0.05 g/100mL is equivalent to a BAC of 0.05 gm%.

Bicycle: A vehicle with one or more wheels that is designed to be propelled by human power through a belt, chain or gears. It does not include a wheelchair, wheeled recreational device, wheeled toy, or any vehicle with an auxiliary motor capable of generating a power output over 200 watts (whether or not the motor is operating).

Bicyclist: A person riding a bicycle, including pillion passengers.

Crash: Any unpremeditated incident where in the course of the use of any vehicle on a road that was not temporarily closed off to the public, a person is injured or property is damaged. The crash must involve vehicle movement. Does not include collisions that occur due to a medical condition, deliberate acts such as suicide attempts, or police chases.

Crash Severity: Derived from the most serious injury in a crash. The five levels are:

1. Fatal Crash - A road crash in which at least one person was killed immediately or died within 30 days of the crash, as a result of the crash.
2. Hospitalisation Crash - A road crash that involved at least one serious injury but no fatalities.
3. Medical Attention Crash - A road crash in which the most serious injury resulted in a person requiring medical treatment, but without being admitted to hospital.
4. Property Damage Only Major Crash – A road crash in which no person was injured, but with estimated property damage exceeding $3,000.
5. Property Damage Only Minor Crash - A road crash in which no person was injured, but with estimated property damage not exceeding $3,000.

Driver: Any person that is driving a vehicle (excluding a motorcycle, bicycle, animal or animal drawn vehicle).

Fatal Crash: A road crash in which at least one person was killed immediately or died within 30 days of the crash, as a result of the crash.

Fatality: A person who was killed immediately or died within 30 days of the day of a road crash as a result of the crash.

Hospitalisation Crash: A road crash that involved at least one serious injury but no fatalities.

KSI: Killed or seriously injured. See *Persons Killed or Seriously Injured*.

KSI Rate: Number of persons killed or seriously injured per specified unit. In this report the following KSI rates are provided:

1. KSI per 100 million vehicle kilometres travelled (MVKT) and
2. KSI per 100,000 population.

Motorcycle: A motor vehicle with two or three wheels. Includes motor vehicles that have a sidecar attached, motor scooters, mopeds, trail bikes and mini-bikes.

Motorcycle Rider: A person riding a motorcycle, motor scooter, moped, trail bike or mini-bike. Excludes pillion and sidecar passengers.

Motorcyclists: A motorcycle rider or motorcycle pillion.

Multi-Vehicle Crash: A crash involving two or more moving vehicles.

Passenger: Any person other than the driver travelling in a motor vehicle. Excludes persons riding on an animal, bicycle or motorcycle and persons in an animal drawn vehicle.

Pedestrian: A person on foot or sitting or lying, a person in or on a wheeled recreational device or wheeled toy, an occupant of a non-motorised wheelchair, an occupant of a motorized wheelchair/gopher, a person pushing a motorised or non-motorised wheelchair. Includes a person on roller skates, in-line skates or a skateboard, but excludes a person riding a bicycle. Also includes a person who has just alighted from a vehicle.

Persons Killed or Seriously Injured: The number of fatalities and persons seriously injured as the result of a crash. Includes persons who were killed outright or died within 30 days of the day of the road crash as a result of the crash and persons admitted to hospital as a result of a road crash and who did not die from injuries sustained in the crash within 30 days of the crash.

Person Seriously Injured: A person admitted to hospital as a result of a road crash and who does not die from injuries sustained in the crash within 30 days of the crash.

Region: Subdivisions of Western Australia used by Main Roads Western Australia.

Rider: Used as an abbreviation for Motorcycle Rider. A person riding a motorcycle, motor scooter, moped, trail bike or mini-bike. Excludes bicycle riders, motorcycle pillion and sidecar passengers.

Rigid Truck: A vehicle constructed primarily for load carrying with a gross vehicle mass (GVM) exceeding 3.5 tonnes.

Road: Any thoroughfare, highway or road that is open to or used by the public for the purpose of driving or riding of motor vehicles.

Road User: Includes drivers, passengers, motorcycle riders, motorcycle pillion, bicycle riders, persons riding an animal, persons in an animal drawn vehicle and pedestrians.

Road User Types: Categories used to separate different road users.

Run-Off Road Crash: Crashes in which a vehicle involved exits the carriageway, through a loss of control, swerving to avoid a collision or for other reasons. After the vehicle has left the carriageway it may also collide with a person, object, or vehicle, or it may roll over, and/or a person may fall or be ejected from the vehicle.

Seatbelt: A device designed to hold a person within the body of a vehicle and limit movement during a crash, thereby reducing severity of injury. Includes inertia reel and fixed lap or sash seat belts, and child car restraints. The device must meet the relevant Australian Vehicle Design Rules and the Australian Standards. Drivers and passengers of motor vehicles must wear seat belts.

Serious Crash: A road crash that resulted in at least one fatality and/or where at least one person was seriously injured. Includes *Fatal* crashes and *Hospitalisation* crashes.

Single-Vehicle Crash: A crash in which only one moving vehicle was involved. Includes collisions with pedestrians, animals and fixed objects such as a tree, pole, bridge, dropped load, or parked vehicle, and includes non-collisions such as a roll-over.

Vulnerable Road User: A motorcyclist, bicyclist or pedestrian.