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## Vehicle speeds in South Australia 2020

CN Kloeden, JE Woolley

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## TITLE

Vehicle speeds in South Australia 2020

## AUTHORS

CN Kloeden, JE Woolley

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The University of Adelaide  
South Australia 5005  
AUSTRALIA

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## ABSTRACT

A systematic and ongoing method of measuring vehicle speeds was introduced in South Australia in 2007 in order to assess the effects of speed reduction countermeasures and to monitor the speed behaviour of South Australian motorists over time. More than 100 sites around South Australia have speed measurements taken for a one week period at the same time each survey year. This Report summarises the data collected in 2020 and makes comparisons with previous surveys and partial surveys dating back to 2002. The following general observations are apparent when considering all the surveys and all the speed measurements: vehicle speeds have been trending down on all road types over the course of the surveys; the percentage of vehicles obeying the speed limit has been increasing; reductions in high level speeding are more pronounced than those for low level speeding; vehicle speeds appear to be stabilising in recent years on 50-80 km/h roads while continuing to decline on 100-110 km/h roads; speed limit compliance is lowest on Adelaide 50 km/h collector roads and rural 100 km/h arterial roads; and vehicle speeds in 2020 appeared to generally increase from 2018 especially on 50 and 110 km/h roads (this may have been COVID-19 related).

## KEYWORDS

Vehicle speed, Speed limit, Driver behaviour, Urban road, Rural road, Statistics.

## Summary

A systematic and ongoing method of measuring vehicle speeds was introduced in South Australia in 2007 in order to assess the effects of speed reduction countermeasures and to monitor the speed behaviour of South Australian motorists over time. The Centre for Automotive Safety Research has analysed each of the surveys conducted in this series.

More than 100 sites around South Australia have speed measurements taken for a one week period at the same time of year. Groups of sites, based on road location and speed limit, are analysed for changes in vehicle speeds between surveys (both all vehicles and just free speed vehicles).

This Report summarises vehicle speed changes in 2020 and makes comparisons with previous surveys and partial surveys dating back to 2002. The mean speeds by road type and survey year are shown in the following Table.

Mean speeds (km/h) by road type and survey year

Year	Adelaide local (50)	Adelaide collector (50)	Adelaide arterial (60)	Rural local (50)	Rural hills arterial (80)	Rural arterial (100)	Rural arterial (110)
2002	46.90	53.83	58.37	44.52	-	-	-
2003	44.76*	51.52*	57.06*	44.34	-	-	-
2005	43.34*	50.23*	56.36*	42.90*	-	-	-
2006	-	-	-	-	-	97.86	102.77
2007	44.24*	50.65	56.76	43.50	78.50	98.06	103.38
2008	43.75*	49.79	55.96*	42.65*	76.59	96.83	103.23
2009	44.10	49.67	55.82	41.87	77.15	96.87	103.38
2010	43.37*	49.46	55.53*	42.15	77.41	96.66	103.02
2011	43.56	49.74	55.43	42.71	-	97.24	103.64*
2012	43.14*	49.11	55.52	42.28	76.87	96.38*	102.09*
2013	42.39*	48.75	54.92*	42.30	74.49*	97.00	102.22
2014	41.68*	48.17*	54.93	41.65*	73.86*	96.94	102.48
2015	41.38	47.88	54.98	41.97	73.51*	96.61	102.29
2016	41.67	47.99	54.55*	41.65	74.04	96.20	101.74
2018	41.47	47.26*	54.53	41.78	74.01	95.51	101.33*
2020	42.12*	47.46	54.79	42.15	74.54	95.76	101.95*

Note: all 50 km/h roads were zoned 60 km/h in 2002

\* statistically significant change from previous survey ( $p < 0.05$ )

The following general observations are apparent when considering all the surveys and all the speed measurements:

- Vehicle speeds have been trending down on all road types over the course of the surveys
- The percentage of vehicles obeying the speed limit has been increasing
- Reductions in high level speeding are more pronounced than those for low level speeding
- Vehicle speeds appear to be stabilising in recent years on 50-80 km/h roads while continuing to decline on 100-110 km/h roads
- Speed limit compliance is lowest on Adelaide 50 km/h collector roads and rural 100 km/h arterial roads
- Vehicle speeds in 2020 appeared to generally increase from 2018 especially on 50 and 110 km/h roads (this may have been COVID-19 related)

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# 1 Introduction

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Speed is an important determinant of crash incidence and outcome and numerous initiatives are being implemented in South Australia with the aim of reducing the speeds of vehicles. A systematic and ongoing method of measuring vehicle speeds in South Australia is required to assess the effects of speed reduction countermeasures and to monitor the speed behaviour of motorists over time.

The South Australian Department for Infrastructure and Transport (formerly the Department of Planning, Transport and Infrastructure) has, for a number of years, contracted CASR to oversee and analyse speed data from a selection of sites in South Australia. The first full set of measurements was taken in 2007 and are reported in Kloeden and Woolley (2009). Follow up surveys were conducted in 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 and 2018 (Kloeden and Woolley, 2010, 2012, 2012a, 2013, 2013a, 2015, 2017, 2017a, 2020). No surveys were conducted in 2017 and 2019.

This report summarises the data collected in 2020 and compares it with previous surveys and partial surveys dating back to 2002.

Individual site details and measurements are available in an associated spreadsheet to this report which can be found at: <https://casr.adelaide.edu.au/publications/list/?id=1936>

Note that this report was substantially completed in April 2021 and does not consider developments after that date.

## 2 Methodology

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### 2.1 Site selection

Table 2.1 shows the number of sites surveyed in each year by road type. Table 2.2 shows the number of site/direction combinations that were successfully surveyed in each year by road type. Individual site details and measurements are available in an associated spreadsheet to this report which can be found at: <http://casr.adelaide.edu.au/publications/list/?id=1936>

The 2002-2005 sites were those used in the evaluation of the introduction of the default 50 km/h speed limit (Kloeden, Woolley and McLean; 2004, 2006). These sites were surveyed by a contractor for one day each in 2002, 2003 and 2005. These sites were surveyed by a contractor again in 2007 and each survey thereafter for a full week mostly in November. Additional sites were surveyed in 2007 for a full week in November each survey year.

The data from relevant rural permanent speed sites maintained by the Department for Infrastructure and Transport were obtained for August of each survey year from 2006 onwards. One week of data was selected from each site for analysis. A series of one week surveys at five 100 km/h rural sites and six 110 km/h rural sites were conducted by the Department in August of each year, however, these surveys ceased to be conducted regularly in 2015 and are no longer used as sites going forward (see the associated spreadsheet to this report for all site sample months).

Some sites had their location moved or had their layout changed and so were given a new site ID and considered to be a new site to reflect the fact that speeds were not comparable before and after the change (details are given in the associated spreadsheet to this report).

Note that there was data collection at six Adelaide arterial 80 km/h sites from 2007 to 2012. However, these sites were dropped completely from 2013 onwards and are not reported here. The data for these sites can be found in a previous report in this series (Kloeden and Woolley, 2013a).

There was also data collection at five rural arterial 60 km/h sites from 2007 to 2014. However, these sites were dropped completely from 2015 onwards and are not reported here. The data for these sites can be found in a previous report in this series (Kloeden and Woolley, 2015).

Table 2.1  
Number of speed survey sites by survey year and road type

Year	Road type (speed limit)							Total
	Adelaide local (50)*	Adelaide collector (50*)	Adelaide arterial (60)	Rural local (50*)	Rural hills arterial (80)	Rural arterial (100)	Rural arterial (110)	
2002	18	11	10	12	-	-	-	51
2003	18	11	10	12	-	-	-	51
2005	18	11	10	12	-	-	-	51
2006	-	-	-	-	-	5	9	14
2007	18	11	27	13	4	9	36	118
2008	18	10	27	13	6	9	35	118
2009	18	11	27	13	6	10	34	119
2010	18	11	27	12	6	10	35	119
2011	17	11	24	10	-	10	34	106
2012	17	11	21	12	6	13	34	114
2013	18	12	25	13	11	13	34	126
2014	17	12	23	12	11	15	34	124
2015	18	11	24	12	12	10	25	112
2016	18	12	26	12	10	11	26	115
2018	18	11	24	12	11	12	25	113
2020	14	12	23	12	8	11	21	101

\* these roads were 60 km/h in 2002

Table 2.2  
Number of site/direction combinations by road type and survey year

Year	Road type (speed limit)							Total
	Adelaide local (50)*	Adelaide collector (50*)	Adelaide arterial (60)	Rural local (50*)	Rural hills arterial (80)	Rural arterial (100)	Rural arterial (110)	
2002	35	22	20	23	-	-	-	100
2003	35	22	20	23	-	-	-	100
2005	35	22	20	23	-	-	-	100
2006	-	-	-	-	-	10	18	28
2007	35	22	54	25	8	18	72	234
2008	35	20	54	25	12	18	70	234
2009	34	22	53	25	12	20	68	234
2010	34	22	54	23	12	20	70	235
2011	33	22	47	20	-	20	68	210
2012	33	22	41	24	12	26	68	226
2013	35	24	50	26	22	26	68	251
2014	33	24	46	24	22	30	68	247
2015	35	22	47	24	24	20	50	222
2016	35	24	51	24	20	21	52	227
2018	35	22	45	24	22	24	50	222
2020	28	24	43	24	16	22	42	199

\* these roads were 60 km/h in 2002

## 2.2 Data collected

The data was collected in most cases using a standard traffic counter box and surface tubes that were set up by either a contractor or the Department for Infrastructure and Transport personnel. At some sites, induction loops were used for measurements. The following information was recorded for each vehicle that passed during each survey period:

- date
- time (to nearest second)
- direction of travel
- speed (to nearest 0.1 km/h or 0.01 km/h in more recent surveys)
- wheelbase (to nearest 0.1 m or 0.01 m in more recent surveys)
- headway (to nearest 0.1 second)
- gap (to nearest 0.1 second)
- number of axles
- class of vehicle (based on number of axles and wheel bases)

The aim was to capture data at each site for a continuous one week period either in August or November depending on the site. Due to equipment malfunctions, some of the time periods had to be extended to capture a full week of valid data.

Due to limitations of the equipment, multilane metropolitan arterial roads with medians only had their median lanes measured and multilane metropolitan arterial roads without medians only had their kerbside lanes measured.

## 2.3 Quantifying and testing speed changes

Due to individual sites becoming unsuitable or changing speed limits and new sites being added over time, a method had to be developed for tracking year to year changes on a varying number of sites.

By concentrating on the changes between one survey and the next rather than on absolute values, sites can come in and out of the survey set. This methodology was introduced in the analysis of the 2009 survey year data (Kloeden and Woolley, 2012) and is explained in detail in Kloeden and Woolley (2013a).

Essentially, all sites that are successfully sampled in adjacent years are compared for changes in a particular speed measurement. The median of these changes is taken as the best estimate of the change from year to year and a Wilcoxon signed rank test is applied to determine the statistical significance of the change. The changes are successively applied to baseline median speed measurements from 2007 to give indicative absolute speed measurements for each year.

This method uses all the available data for determining changes, is tolerant of sites dropping out and allows new sites to be added to the analysis over time (thus increasing the statistical power of detecting speed changes).



## 2.4 Quantifying traffic volume changes

In order to quantify the changes in vehicle volumes over time, a similar method to that for speed changes was used. For all of the sites in a road type successfully sampled in adjacent surveys: the ratio of the count in the latter survey to the earlier survey was calculated for each sample and the median value of these was taken as the proportional change from the earlier to the latter survey. The survey in 2007 was set at 100 and the calculated ratios were applied successively to get cumulative volume estimates in other survey years. This gives the relative traffic volumes in each road type over time.

### 3 Speeds of all vehicles

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This Section compares the speeds of all vehicles collected in the various surveys on the different road types. Individual site details and measurements are available in an associated spreadsheet to this report which can be found at: <http://casr.adelaide.edu.au/publications/list/?id=1936>

### 3.1 Adelaide 50 km/h local roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.1 and the changes from one survey to the next in Table 3.2.

Table 3.1  
Adelaide 50 km/h local road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002	46.90	48.55	57.15	34.22	20.30	9.69	3.18
2003	44.76	45.94	54.29	26.22	12.62	5.72	1.93
2005	43.34	44.34	53.05	23.74	11.36	5.01	1.78
2007	44.24	45.40	53.50	24.65	11.95	5.01	1.78
2008	43.75	44.70	52.80	22.47	11.28	4.77	1.72
2009	44.10	45.10	52.80	23.23	11.39	4.75	1.62
2010	43.37	44.35	52.10	21.35	10.49	4.40	1.42
2011	43.56	44.75	52.40	22.88	11.12	4.40	1.45
2012	43.14	44.45	52.00	22.19	10.55	4.27	1.44
2013	42.39	43.85	51.30	20.09	9.35	4.04	1.28
2014	41.68	43.25	50.70	19.98	9.27	3.95	1.21
2015	41.38	42.95	50.30	19.28	9.17	3.92	1.21
2016	41.67	43.21	50.36	20.03	9.28	4.03	1.30
2018	41.47	43.17	50.18	19.65	9.14	3.91	1.25
2020	42.12	43.87	50.92	20.88	9.33	3.97	1.19

Note: these roads were 60 km/h in 2002

Table 3.2  
Adelaide 50 km/h local road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002-2003	-2.14*	-2.61*	-2.86*	-7.99*	-7.68*	-3.97*	-1.25*
2003-2005	-1.42*	-1.60*	-1.24*	-2.48	-1.26	-0.71	-0.15
2005-2007	0.91*	1.06*	0.45	0.91	0.60	0.00	0.00
2007-2008	-0.50*	-0.70	-0.70	-2.18*	-0.68*	-0.24	-0.06
2008-2009	0.35	0.40	0.00	0.76	0.11	-0.02	-0.11*
2009-2010	-0.73*	-0.75*	-0.70*	-1.89*	-0.90*	-0.35*	-0.20*
2010-2011	0.19	0.40	0.30	1.53*	0.64	0.00	0.03
2011-2012	-0.42*	-0.30*	-0.40*	-0.69*	-0.58*	-0.13	-0.01
2012-2013	-0.75*	-0.60	-0.70*	-2.10*	-1.20*	-0.23*	-0.16*
2013-2014	-0.71*	-0.60*	-0.60*	-0.12	-0.08	-0.10*	-0.07*
2014-2015	-0.31	-0.30	-0.40*	-0.70*	-0.10*	-0.03	-0.00
2015-2016	0.30	0.26	0.06	0.75	0.12	0.11	0.09*
2016-2018	-0.20	-0.04	-0.18	-0.38	-0.15	-0.12	-0.05
2018-2020	0.64*	0.70*	0.75*	1.23	0.19	0.06	-0.06

\* statistically significant change ( $p < 0.05$ )

## 3.2 Adelaide 50 km/h collector roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.3 and the changes from one survey to the next in Table 3.4.

Table 3.3  
Adelaide 50 km/h collector road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002	53.83	54.24	61.06	68.16	43.85	21.60	6.48
2003	51.52	51.51	59.09	58.78	30.00	12.45	4.20
2005	50.23	50.35	57.26	52.48	24.12	8.38	2.86
2007	50.65	50.80	57.90	55.02	25.84	9.21	2.94
2008	49.79	49.95	57.00	49.97	23.04	7.89	2.34
2009	49.67	50.05	56.55	49.99	22.88	7.49	2.32
2010	49.46	50.00	56.50	49.88	22.12	7.32	2.08
2011	49.74	50.30	56.95	52.05	22.97	7.53	2.02
2012	49.11	49.55	56.00	48.07	20.15	6.53	1.68
2013	48.75	49.15	55.50	45.06	18.59	5.72	1.42
2014	48.17	48.80	55.35	43.35	17.93	5.55	1.42
2015	47.88	48.35	54.65	40.87	15.57	4.84	1.21
2016	47.99	48.53	54.88	42.60	16.03	5.08	1.29
2018	47.26	47.82	53.96	37.22	14.17	4.67	1.18
2020	47.46	48.21	54.13	39.00	14.92	4.51	1.08

Note: these roads were 60 km/h in 2002

Table 3.4  
Adelaide 50 km/h collector road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002-2003	-2.30*	-2.72*	-1.97*	-9.39*	-13.85*	-9.15*	-2.28*
2003-2005	-1.29*	-1.16*	-1.83*	-6.30*	-5.87*	-4.07*	-1.34*
2005-2007	0.42	0.45	0.64	2.54	1.72	0.83	0.07
2007-2008	-0.87	-0.85	-0.90	-5.05*	-2.80*	-1.32*	-0.59*
2008-2009	-0.12	0.10	-0.45	0.02	-0.17	-0.40	-0.02
2009-2010	-0.21	-0.05	-0.05	-0.10	-0.76	-0.17	-0.24
2010-2011	0.28	0.30	0.45	2.16	0.85	0.21	-0.06
2011-2012	-0.63	-0.75*	-0.95*	-3.98*	-2.82*	-1.00*	-0.34*
2012-2013	-0.37	-0.40	-0.50*	-3.01	-1.57*	-0.81*	-0.26*
2013-2014	-0.57*	-0.35	-0.15	-1.71	-0.66	-0.17	-0.00
2014-2015	-0.29	-0.45	-0.70*	-2.48	-2.36*	-0.71*	-0.21*
2015-2016	0.10	0.18	0.23	1.73	0.46	0.24	0.08
2016-2018	-0.73*	-0.71*	-0.92*	-5.39*	-1.86*	-0.41*	-0.12
2018-2020	0.20	0.39	0.17	1.78	0.74	-0.17	-0.10

\* statistically significant change ( $p < 0.05$ )

### 3.3 Adelaide 60 km/h arterial roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.5 and the changes from one survey to the next in Table 3.6. Note that a minor error at one site in 2018 was corrected leading to slightly different results for the 2018 survey presented here compared to those presented in the previous report in this series.

Table 3.5  
Adelaide 60 km/h arterial road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 60 km/h	% above 65 km/h	% above 70 km/h	% above 75 km/h
2002	58.37	58.74	63.54	37.08	9.55	2.49	1.04
2003	57.06	57.87	62.80	31.24	6.91	1.97	0.84
2005	56.36	57.08	61.81	25.39	4.97	1.29	0.46
2007	56.76	57.45	62.15	27.29	5.64	1.27	0.43
2008	55.96	56.65	61.30	21.82	3.95	0.93	0.34
2009	55.82	56.45	61.00	19.83	3.53	0.83	0.31
2010	55.53	56.15	60.60	17.73	3.05	0.69	0.27
2011	55.43	56.15	60.60	17.87	3.08	0.70	0.26
2012	55.52	56.15	60.40	17.52	2.80	0.60	0.21
2013	54.92	55.35	59.60	12.61	1.92	0.47	0.17
2014	54.93	55.40	59.55	12.21	1.77	0.44	0.16
2015	54.98	55.50	59.85	13.74	2.04	0.50	0.18
2016	54.55	55.12	59.34	12.43	1.78	0.45	0.17
2018	54.53	55.08	59.23	12.06	1.67	0.41	0.14
2020	54.79	55.19	59.37	12.89	1.73	0.40	0.13

Table 3.6  
Adelaide 60 km/h arterial road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 60 km/h	% above 65 km/h	% above 70 km/h	% above 75 km/h
2002-2003	-1.31*	-0.88*	-0.74*	-5.85*	-2.64*	-0.51*	-0.20*
2003-2005	-0.70*	-0.79*	-0.99*	-5.85*	-1.93*	-0.68*	-0.38*
2005-2007	0.40	0.38	0.34	1.90	0.66	-0.02	-0.03
2007-2008	-0.80*	-0.80*	-0.85*	-5.47*	-1.69*	-0.34*	-0.09*
2008-2009	-0.14	-0.20	-0.30	-1.99	-0.42*	-0.10*	-0.03*
2009-2010	-0.29*	-0.30*	-0.40*	-2.10*	-0.49*	-0.14*	-0.04*
2010-2011	-0.10	0.00	0.00	0.14	0.04	0.01	-0.01
2011-2012	0.10	-0.00	-0.20	-0.35	-0.28	-0.10	-0.04
2012-2013	-0.60*	-0.80*	-0.80*	-4.92*	-0.88*	-0.13*	-0.05*
2013-2014	0.00	0.05	-0.05	-0.39	-0.15	-0.04	-0.01
2014-2015	0.05	0.10	0.30	1.53	0.27	0.06*	0.02*
2015-2016	-0.42*	-0.38	-0.51*	-1.31	-0.26*	-0.05	-0.01
2016-2018	-0.02	-0.04	-0.11	-0.36	-0.11	-0.04*	-0.03*
2018-2020	0.26	0.11	0.14	0.82	0.06	-0.01	-0.01

\* statistically significant change ( $p < 0.05$ )

### 3.4 Rural 50 km/h local roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.7 and the changes from one survey to the next in Table 3.8.

Table 3.7  
Rural 50 km/h local road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002	44.52	46.42	56.67	37.07	16.08	6.44	2.22
2003	44.34	45.65	55.47	35.68	14.12	5.62	1.79
2005	42.90	44.40	53.63	30.81	12.17	4.47	1.47
2007	43.50	44.70	54.10	31.38	12.17	4.47	1.44
2008	42.65	43.70	53.10	28.66	10.12	3.32	0.92
2009	41.87	43.20	53.00	28.59	10.12	3.32	0.92
2010	42.15	43.50	52.90	29.54	10.46	3.32	0.99
2011	42.71	43.90	52.75	29.66	10.33	3.33	0.99
2012	42.28	43.60	52.15	28.49	9.82	2.83	0.86
2013	42.30	43.75	52.20	28.78	9.46	2.83	0.86
2014	41.65	43.30	51.15	26.79	8.30	2.52	0.79
2015	41.97	43.60	51.40	26.57	8.28	2.56	0.81
2016	41.65	43.21	51.54	26.13	8.38	2.57	0.94
2018	41.78	43.36	51.34	25.95	8.22	2.45	0.82
2020	42.15	43.80	51.55	26.40	8.27	2.45	0.82

Note: these roads were 60 km/h in 2002

Table 3.8  
Rural 50 km/h local road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002-2003	-0.17	-0.77	-1.20	-1.38	-1.96*	-0.81*	-0.43*
2003-2005	-1.44*	-1.25*	-1.84*	-4.87*	-1.95*	-1.15*	-0.33*
2005-2007	0.60	0.30	0.47	0.57	0.00	0.00	-0.02
2007-2008	-0.85*	-1.00*	-1.00*	-2.72*	-2.04*	-1.15*	-0.52*
2008-2009	-0.78	-0.50	-0.10	-0.07	0.00	0.00	0.00
2009-2010	0.28	0.30	-0.10	0.95	0.34	0.00	0.07*
2010-2011	0.56	0.40	-0.15	0.12	-0.13	0.01	0.00
2011-2012	-0.43	-0.30	-0.60	-1.17*	-0.52	-0.50*	-0.13
2012-2013	0.02	0.15	0.05	0.29	-0.35	0.00	0.00
2013-2014	-0.65*	-0.45*	-1.05*	-1.99*	-1.16	-0.30	-0.06
2014-2015	0.32	0.30	0.25	-0.22	-0.02	0.04	0.02
2015-2016	-0.32	-0.39	0.14	-0.44	0.09	0.01	0.13
2016-2018	0.13	0.16	-0.20	-0.18	-0.16	-0.12*	-0.12*
2018-2020	0.37	0.43	0.22	0.45	0.05	0.00	0.00

\* statistically significant change ( $p < 0.05$ )

### 3.5 Rural hills 80 km/h arterial roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.9 and the changes from one survey to the next in Table 3.10. Note that there were problems with a new contractor identifying the correct locations for these sites in 2011 meaning that no data is available for 2011 so 2012 data is compared to data from 2010.

Table 3.9  
Rural hills 80 km/h arterial road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 80 km/h	% above 85 km/h	% above 90 km/h	% above 95 km/h
2007	78.50	78.30	87.05	40.80	20.59	9.70	4.74
2008	76.59	76.60	84.75	34.41	18.71	8.98	4.15
2009	77.15	77.20	85.30	36.99	19.49	9.80	4.75
2010	77.41	77.35	85.20	37.49	19.54	9.92	4.63
2012	76.87	77.05	84.30	35.68	17.39	8.49	3.16
2013	74.49	74.70	80.75	26.85	11.68	5.37	1.94
2014	73.86	73.80	80.00	24.99	10.27	5.07	1.86
2015	73.51	73.60	79.05	23.74	9.10	4.19	1.48
2016	74.04	73.94	79.42	25.17	9.82	4.46	1.58
2018	74.01	74.04	79.19	23.86	9.58	4.34	1.52
2020	74.54	74.62	79.59	26.16	10.32	4.42	1.55

Table 3.10  
Rural hills 80 km/h arterial road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 80 km/h	% above 85 km/h	% above 90 km/h	% above 95 km/h
2007-2008	-1.91	-1.70	-2.30	-6.39	-1.89	-0.72	-0.60
2008-2009	0.56	0.60	0.55	2.59	0.78	0.82	0.60
2009-2010	0.27	0.15	-0.10	0.50	0.05	0.11	-0.12
2010-2012	-0.55	-0.30	-0.90	-1.81	-2.15	-1.43	-1.47*
2012-2013	-2.37*	-2.35*	-3.55*	-8.83*	-5.71*	-3.12*	-1.22*
2013-2014	-0.63*	-0.90*	-0.75*	-1.86	-1.41*	-0.30	-0.09
2014-2015	-0.35*	-0.20	-0.95*	-1.25	-1.17*	-0.88*	-0.38*
2015-2016	0.52	0.34	0.36	1.44	0.72	0.27	0.10
2016-2018	-0.03	0.09	-0.23	-1.31	-0.24	-0.13	-0.05
2018-2020	0.54	0.58	0.40	2.31	0.74	0.09	0.02

\* statistically significant change ( $p < 0.05$ )

### 3.6 Rural 100 km/h arterial roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.11 and the changes from one survey to the next in Table 3.12. Note that a 110 km/h site that had its speed limit reduced to 100 km/h in 2016 was identified in the current analysis resulting in slightly different results for the 2016 and 2018 surveys presented here compared to those presented in previous reports (where it was assumed the site remained at 110 km/h).

Table 3.11  
Rural 100 km/h arterial road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 100 km/h	% above 105 km/h	% above 110 km/h	% above 115 km/h
2006	97.86	98.55	107.85	44.29	23.63	11.19	5.27
2007	98.06	99.15	108.15	46.22	24.02	11.34	5.16
2008	96.83	98.10	106.80	42.29	20.56	9.81	4.63
2009	96.87	98.10	106.35	41.84	20.12	9.49	4.63
2010	96.66	97.75	106.20	41.11	19.54	8.91	4.43
2011	97.24	98.25	106.40	43.76	20.48	9.29	4.55
2012	96.38	97.40	105.45	39.28	16.60	7.59	3.69
2013	97.00	97.95	106.00	42.02	17.88	7.97	3.80
2014	96.94	97.95	105.70	42.25	17.50	7.64	3.69
2015	96.61	97.65	105.20	40.15	16.36	7.22	3.59
2016	96.20	97.45	104.76	37.96	15.99	7.24	3.60
2018	95.51	96.93	104.52	35.47	15.03	6.83	3.40
2020	95.76	96.70	104.18	34.68	14.85	6.62	3.37

Table 3.12  
Rural 100 km/h arterial road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 100 km/h	% above 105 km/h	% above 110 km/h	% above 115 km/h
2006-2007	0.19	0.60	0.30	1.94	0.39	0.14	-0.10
2007-2008	-1.23	-1.05*	-1.35*	-3.93*	-3.46*	-1.53*	-0.53*
2008-2009	0.04	0.00	-0.45	-0.45	-0.44	-0.31	0.00
2009-2010	-0.21	-0.35	-0.15	-0.73	-0.59	-0.58	-0.20
2010-2011	0.58	0.50	0.20	2.65	0.95	0.38	0.12
2011-2012	-0.86*	-0.85*	-0.95*	-4.48*	-3.89*	-1.70*	-0.87*
2012-2013	0.62	0.55	0.55	2.74*	1.29	0.38	0.11
2013-2014	-0.06	0.00	-0.30	0.23	-0.38	-0.33	-0.11
2014-2015	-0.33	-0.30	-0.50	-2.10	-1.14	-0.43	-0.09
2015-2016	-0.40	-0.20	-0.44	-2.19	-0.37	0.03	0.00
2016-2018	-0.69	-0.52	-0.24	-2.49	-0.95*	-0.41*	-0.20*
2018-2020	0.24	-0.23	-0.34	-0.79	-0.19	-0.21	-0.03

\* statistically significant change ( $p < 0.05$ )



### 3.7 Rural 110 km/h arterial roads

The summary speed measurements for all vehicles passing the measured sites for all the surveys are presented in Table 3.13 and the changes from one survey to the next in Table 3.14. Note that a 110 km/h site that had its speed limit reduced to 100 km/h in 2016 was identified in the current analysis resulting in slightly different results for the 2016 and 2018 surveys presented here compared to those presented in previous reports (where it was assumed the site remained at 110 km/h).

Table 3.13  
Rural 110 km/h arterial road speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 110 km/h	% above 115 km/h	% above 120 km/h	% above 125 km/h
2006	102.77	103.85	113.50	26.77	12.39	4.59	1.46
2007	103.38	104.45	114.00	28.05	12.62	4.49	1.75
2008	103.23	104.40	113.70	27.37	11.87	3.96	1.59
2009	103.38	104.55	113.60	27.61	11.92	3.82	1.54
2010	103.02	104.15	113.20	26.16	11.25	3.50	1.44
2011	103.64	104.80	113.50	26.86	11.70	3.79	1.59
2012	102.09	103.30	111.45	20.96	8.64	2.70	1.02
2013	102.22	103.55	111.60	21.83	8.52	2.71	1.02
2014	102.48	103.85	111.50	20.91	8.19	2.59	0.89
2015	102.29	103.60	111.25	19.88	7.83	2.47	0.87
2016	101.74	103.31	110.72	18.46	7.05	2.18	0.73
2018	101.33	102.83	109.73	15.59	5.80	1.83	0.60
2020	101.95	103.74	109.97	16.68	6.15	2.01	0.61

Table 3.14  
Rural 110 km/h arterial road speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 110 km/h	% above 115 km/h	% above 120 km/h	% above 125 km/h
2006-2007	0.61	0.60	0.50	1.29	0.23	-0.10	0.30
2007-2008	-0.14	-0.05*	-0.30*	-0.69*	-0.75*	-0.53*	-0.16*
2008-2009	0.15	0.15	-0.10	0.24	0.06	-0.13	-0.05
2009-2010	-0.36	-0.40	-0.40*	-1.45	-0.67*	-0.33*	-0.10*
2010-2011	0.62*	0.65*	0.30	0.70	0.44	0.30	0.16
2011-2012	-1.55*	-1.50*	-2.05*	-5.91*	-3.06*	-1.09*	-0.57*
2012-2013	0.13	0.25	0.15	0.88	-0.11	0.01	-0.01
2013-2014	0.26	0.30	-0.10	-0.93	-0.34*	-0.13*	-0.13*
2014-2015	-0.19	-0.25	-0.25	-1.02	-0.36	-0.12	-0.01
2015-2016	-0.54	-0.29	-0.54	-1.42	-0.77	-0.29	-0.14
2016-2018	-0.42*	-0.48*	-0.98*	-2.87*	-1.25*	-0.35*	-0.13*
2018-2020	0.63*	0.90*	0.24	1.08	0.35	0.18	0.01

\* statistically significant change ( $p < 0.05$ )

## 4 Speeds of free speed vehicles

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This Section compares the speeds of all free speed vehicles collected in the various surveys on the different road types. Free speed vehicles were defined as those that had at least a four second headway gap to the vehicle in front of them (ie the time between the front wheels of the two vehicles passing the measurement site was at least four seconds).

The drivers of free speed vehicles presumably all make a choice of what speed to travel at unlike the drivers of vehicles in a platoon that are limited to the speed of the front vehicle. By examining just free speed vehicles, freely chosen speeds can be analysed. However, this is not the same as the speeds that all drivers would choose if they could do so as the preferred speeds of drivers behind other vehicles cannot be known. This method also tends to bias measured speeds to those times when traffic volumes are low. Our preference is for using all vehicle speeds as these are not subject to the same biases as free speeds and they represent the total speed behaviour of all vehicles. However, since free speeds are commonly used, they are calculated and presented below.

The results for free speed vehicles were very similar results to those for all vehicles. While the free speed measurements were slightly higher than all speed measurements (as would be expected) the changes were very similar and the sets of changes that were statistically significant were almost identical.

## 4.1 Adelaide 50 km/h local roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.1 and the changes from one survey to the next in Table 4.2.

Table 4.1  
Adelaide 50 km/h local road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002	47.40	48.58	58.10	35.11	21.17	10.37	3.05
2003	45.09	45.97	55.00	27.07	13.97	5.90	1.87
2005	43.75	44.37	53.76	25.11	12.78	5.35	1.82
2007	44.65	45.50	54.20	26.00	13.27	5.36	1.82
2008	44.23	44.90	53.80	23.69	12.69	5.12	1.76
2009	44.54	45.15	53.80	24.28	12.75	5.08	1.63
2010	43.88	44.35	53.15	22.39	11.78	4.68	1.48
2011	43.98	44.75	53.45	23.72	12.27	4.58	1.57
2012	43.55	44.55	53.15	23.11	11.79	4.45	1.56
2013	42.77	43.95	52.55	20.66	10.62	4.21	1.37
2014	42.04	43.35	51.95	20.55	10.48	4.11	1.30
2015	41.73	43.05	51.65	19.85	10.39	4.08	1.30
2016	42.08	43.22	51.68	20.82	10.52	4.21	1.38
2018	41.96	43.20	51.51	20.56	10.37	4.09	1.38
2020	42.58	43.86	52.30	21.95	10.56	4.13	1.31

Note: these roads were 60 km/h in 2002

Table 4.2  
Adelaide 50 km/h local road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002-2003	-2.31*	-2.61*	-3.10*	-8.04*	-7.20*	-4.47*	-1.17*
2003-2005	-1.33*	-1.60*	-1.24*	-1.97	-1.19	-0.54	-0.06
2005-2007	0.90*	1.13*	0.44	0.90	0.48	0.01	0.00
2007-2008	-0.43*	-0.60*	-0.40	-2.32*	-0.57*	-0.24	-0.06
2008-2009	0.32	0.25	0.00	0.59	0.05	-0.04	-0.13*
2009-2010	-0.66*	-0.80*	-0.65*	-1.88*	-0.97*	-0.40*	-0.15*
2010-2011	0.10	0.40	0.30	1.33*	0.49	-0.10	0.09
2011-2012	-0.42*	-0.20*	-0.30*	-0.61*	-0.48*	-0.14	-0.01
2012-2013	-0.78*	-0.60	-0.60*	-2.46*	-1.17*	-0.23*	-0.20*
2013-2014	-0.73*	-0.60*	-0.60*	-0.11	-0.14	-0.10*	-0.07*
2014-2015	-0.31	-0.30	-0.30*	-0.70*	-0.09*	-0.04	-0.01
2015-2016	0.35	0.17	0.03	0.97	0.12	0.13	0.09*
2016-2018	-0.12	-0.02	-0.17	-0.25	-0.14	-0.12	0.00
2018-2020	0.62*	0.66	0.79*	1.39	0.19	0.04	-0.07

\* statistically significant change ( $p < 0.05$ )

## 4.2 Adelaide 50 km/h collector roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.3 and the changes from one survey to the next in Table 4.4.

Table 4.3  
Adelaide 50 km/h collector road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002	54.11	54.31	60.96	69.10	43.60	22.29	6.75
2003	51.83	51.70	58.83	59.89	30.66	12.89	4.47
2005	50.49	50.60	57.19	53.54	24.29	8.49	3.05
2007	50.82	50.90	57.95	55.48	26.21	9.37	3.05
2008	49.94	50.10	57.15	50.48	23.19	8.01	2.43
2009	49.84	50.10	56.70	50.67	22.94	7.59	2.43
2010	49.65	50.05	56.50	50.63	22.29	7.46	2.18
2011	49.94	50.30	56.90	52.71	23.10	7.64	2.11
2012	49.34	49.55	56.00	48.62	20.17	6.50	1.75
2013	48.93	49.15	55.40	45.61	18.96	5.73	1.46
2014	48.32	48.90	55.25	44.38	18.43	5.53	1.46
2015	48.02	48.45	54.55	42.05	15.83	4.87	1.25
2016	48.18	48.66	54.83	44.26	16.42	5.16	1.36
2018	47.52	47.97	53.89	38.71	14.38	4.64	1.20
2020	47.64	48.25	54.04	40.29	14.95	4.45	1.09

Note: these roads were 60 km/h in 2002

Table 4.4  
Adelaide 50 km/h collector road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002-2003	-2.28*	-2.62*	-2.14*	-9.21*	-12.94*	-9.39*	-2.27*
2003-2005	-1.34*	-1.09*	-1.64*	-6.35*	-6.37*	-4.40*	-1.43*
2005-2007	0.32	0.30	0.77	1.94	1.92	0.88	0.01
2007-2008	-0.88	-0.80	-0.80	-5.00*	-3.02*	-1.36*	-0.63*
2008-2009	-0.10	0.00	-0.45	0.19	-0.25	-0.42	0.00
2009-2010	-0.19	-0.05	-0.20	-0.04	-0.65	-0.13	-0.25
2010-2011	0.28	0.25	0.40	2.08	0.81	0.18	-0.07
2011-2012	-0.60	-0.75*	-0.90*	-4.09*	-2.93*	-1.14*	-0.36*
2012-2013	-0.41	-0.40	-0.60*	-3.02	-1.20*	-0.77*	-0.29*
2013-2014	-0.60*	-0.25	-0.15	-1.23	-0.53	-0.19	0.00
2014-2015	-0.30	-0.45	-0.70*	-2.33	-2.60*	-0.66*	-0.21*
2015-2016	0.16	0.21	0.28	2.21	0.59	0.28	0.10
2016-2018	-0.66*	-0.69*	-0.93*	-5.56*	-2.04*	-0.52*	-0.16*
2018-2020	0.12	0.28	0.15	1.58	0.57	-0.19	-0.11

\* statistically significant change ( $p < 0.05$ )

### 4.3 Adelaide 60 km/h arterial roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.5 and the changes from one survey to the next in Table 4.6. Note that a minor error at one site in 2018 was corrected leading to slightly different results for the 2018 survey presented here compared to those presented in the previous report in this series.

Table 4.5  
Adelaide 60 km/h arterial road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 60 km/h	% above 65 km/h	% above 70 km/h	% above 75 km/h
2002	58.55	58.96	64.45	41.02	13.48	4.05	1.79
2003	57.59	58.12	63.55	35.01	10.17	3.10	1.42
2005	56.92	57.52	62.53	30.83	7.28	2.01	0.68
2007	57.35	57.90	63.00	33.20	8.26	2.06	0.75
2008	56.61	57.15	62.20	28.77	6.29	1.56	0.60
2009	56.40	56.95	61.90	26.47	5.46	1.40	0.53
2010	56.08	56.55	61.50	24.20	4.78	1.18	0.45
2011	56.14	56.55	61.60	24.48	4.67	1.18	0.42
2012	56.24	56.55	61.60	24.49	4.40	1.02	0.35
2013	55.57	55.75	60.80	18.70	3.08	0.74	0.26
2014	55.56	55.80	60.70	18.19	2.91	0.68	0.24
2015	55.76	55.90	60.90	20.27	3.35	0.81	0.28
2016	55.31	55.55	60.40	18.71	2.97	0.76	0.27
2018	55.27	55.47	60.23	17.86	2.78	0.68	0.22
2020	55.39	55.62	60.40	18.86	2.84	0.66	0.20

Table 4.6  
Adelaide 60 km/h arterial road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 60 km/h	% above 65 km/h	% above 70 km/h	% above 75 km/h
2002-2003	-0.96*	-0.84*	-0.90*	-6.01*	-3.31*	-0.94*	-0.37*
2003-2005	-0.66*	-0.61*	-1.02*	-4.18*	-2.89*	-1.09*	-0.74*
2005-2007	0.42	0.38	0.46	2.37	0.98	0.05	0.07
2007-2008	-0.74*	-0.75*	-0.80*	-4.44*	-1.97*	-0.51*	-0.15*
2008-2009	-0.21	-0.20	-0.30	-2.30	-0.83*	-0.16*	-0.07*
2009-2010	-0.32*	-0.40*	-0.40*	-2.26*	-0.67*	-0.22*	-0.08*
2010-2011	0.05	0.00	0.10	0.28	-0.12	-0.01	-0.03
2011-2012	0.10	0.00	0.00	0.01	-0.27	-0.16	-0.07
2012-2013	-0.67*	-0.80*	-0.80*	-5.79*	-1.32*	-0.28*	-0.09*
2013-2014	-0.01	0.05	-0.10	-0.51	-0.18	-0.06	-0.01
2014-2015	0.20	0.10	0.20	2.08	0.44	0.13*	0.04*
2015-2016	-0.44	-0.35	-0.50*	-1.55	-0.38*	-0.05	-0.01
2016-2018	-0.04	-0.07	-0.16	-0.85	-0.20	-0.07*	-0.05*
2018-2020	0.12	0.15	0.17	1.00	0.06	-0.02	-0.02

\* statistically significant change ( $p < 0.05$ )

## 4.4 Rural 50 km/h local roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.7 and the changes from one survey to the next in Table 4.8.

Table 4.7  
Rural 50 km/h local road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002	44.07	46.16	56.75	37.38	16.69	6.54	2.31
2003	44.41	45.61	55.67	36.17	14.66	5.70	1.86
2005	42.97	44.50	53.81	31.36	12.49	4.62	1.54
2007	43.51	44.80	54.30	31.41	12.49	4.62	1.53
2008	42.67	43.90	53.30	28.69	10.57	3.26	0.89
2009	42.02	43.40	53.20	28.69	10.57	3.26	0.89
2010	42.25	43.70	53.20	29.42	10.91	3.26	0.94
2011	42.59	43.95	53.10	29.53	10.73	3.26	0.94
2012	42.35	43.80	52.70	28.32	10.21	2.78	0.81
2013	42.31	43.95	52.80	28.55	9.80	2.78	0.81
2014	41.71	43.35	51.70	26.33	8.61	2.48	0.72
2015	42.10	43.65	52.00	26.20	8.59	2.53	0.75
2016	41.81	43.26	52.20	25.75	8.69	2.53	0.88
2018	41.92	43.40	51.96	25.51	8.49	2.41	0.76
2020	42.25	43.81	52.10	25.83	8.58	2.41	0.76

Note: these roads were 60 km/h in 2002

Table 4.8  
Rural 50 km/h local road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 50 km/h	% above 55 km/h	% above 60 km/h	% above 65 km/h
2002-2003	0.34	-0.55	-1.08	-1.22	-2.04*	-0.85*	-0.45*
2003-2005	-1.44*	-1.11*	-1.86*	-4.81*	-2.17*	-1.07*	-0.32*
2005-2007	0.54	0.30	0.49	0.05	0.00	0.00	-0.01
2007-2008	-0.84*	-0.90*	-1.00*	-2.72*	-1.92*	-1.37*	-0.64*
2008-2009	-0.65	-0.50	-0.10	0.00	0.00	0.00	0.00
2009-2010	0.23	0.30	0.00	0.73	0.34	0.00	0.05
2010-2011	0.34	0.25	-0.10	0.12	-0.18	0.00	0.00
2011-2012	-0.24	-0.15	-0.40	-1.22*	-0.52	-0.48*	-0.14
2012-2013	-0.04	0.15	0.10	0.24	-0.41	0.00	0.00
2013-2014	-0.59*	-0.60*	-1.10*	-2.22*	-1.19	-0.30	-0.09
2014-2015	0.39	0.30	0.30	-0.13	-0.02	0.04	0.03
2015-2016	-0.30	-0.38	0.21	-0.45	0.09	0.00	0.13
2016-2018	0.12	0.13	-0.25	-0.24	-0.20	-0.12*	-0.12*
2018-2020	0.33	0.41	0.14	0.32	0.10	0.00	0.00

\* statistically significant change ( $p < 0.05$ )

## 4.5 Rural hills 80 km/h arterial roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.9 and the changes from one survey to the next in Table 4.10. Note that there were problems with a new contractor identifying the correct locations for these sites in 2011 meaning that no data is available for 2011 so 2012 data is compared to data from 2010.

Table 4.9  
Rural hills 80 km/h arterial road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 80 km/h	% above 85 km/h	% above 90 km/h	% above 95 km/h
2007	79.53	79.15	88.10	45.06	23.69	11.46	5.73
2008	77.69	77.40	85.85	38.24	21.38	10.55	5.02
2009	78.40	78.00	86.35	40.83	22.25	11.67	5.85
2010	78.72	78.05	86.05	41.06	21.87	11.60	5.71
2012	78.10	78.00	85.05	40.39	19.79	10.05	4.57
2013	75.68	75.65	81.40	31.63	13.25	6.63	3.21
2014	74.85	74.85	80.25	29.55	11.83	6.25	3.12
2015	74.54	74.65	79.35	29.01	10.64	5.38	2.67
2016	75.01	74.91	79.57	29.99	11.16	5.62	2.83
2018	75.02	74.97	79.35	28.84	11.01	5.69	2.82
2020	75.47	75.47	79.69	30.82	11.63	5.80	2.83

Table 4.10  
Rural hills 80 km/h arterial road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 80 km/h	% above 85 km/h	% above 90 km/h	% above 95 km/h
2007-2008	-1.84	-1.75	-2.25	-6.82	-2.32	-0.91	-0.71
2008-2009	0.71	0.60	0.50	2.59	0.87	1.12	0.83
2009-2010	0.32	0.05	-0.30	0.23	-0.38	-0.07	-0.14
2010-2012	-0.62	-0.05	-1.00	-0.68	-2.07	-1.55	-1.14*
2012-2013	-2.42*	-2.35*	-3.65*	-8.75*	-6.54*	-3.42*	-1.36*
2013-2014	-0.82*	-0.80*	-1.15*	-2.08	-1.42*	-0.38	-0.08
2014-2015	-0.31*	-0.20	-0.90*	-0.54	-1.20*	-0.87*	-0.46*
2015-2016	0.47	0.26	0.23	0.99	0.52	0.23	0.16
2016-2018	0.01	0.06	-0.22	-1.16	-0.15	0.07	-0.01
2018-2020	0.45	0.51	0.34	1.98	0.63	0.12	0.01

\* statistically significant change ( $p < 0.05$ )

## 4.6 Rural 100 km/h arterial roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.11 and the changes from one survey to the next in Table 4.12. Note that a 110 km/h site that had its speed limit reduced to 100 km/h in 2016 was identified in the current analysis resulting in slightly different results for the 2016 and 2018 surveys presented here compared to those presented in previous reports (where it was assumed the site remained at 110 km/h).

Table 4.11  
Rural 100 km/h arterial road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 100 km/h	% above 105 km/h	% above 110 km/h	% above 115 km/h
2006	98.18	98.95	108.15	45.42	24.47	11.74	5.56
2007	98.41	99.55	108.55	47.53	24.89	11.98	5.55
2008	97.21	98.55	107.10	42.90	20.99	10.36	4.86
2009	97.30	98.55	106.65	42.38	20.56	10.01	4.86
2010	97.05	98.30	106.55	41.47	20.16	9.36	4.59
2011	97.64	98.75	106.70	43.87	21.28	9.76	4.76
2012	96.80	98.00	105.75	39.43	17.50	8.20	3.80
2013	97.42	98.55	106.30	42.52	18.99	8.71	4.00
2014	97.33	98.50	105.95	42.62	18.31	8.28	3.89
2015	96.98	98.15	105.35	40.36	16.83	7.74	3.73
2016	96.55	97.77	104.89	38.15	16.54	7.82	3.74
2018	95.84	97.32	104.68	35.41	15.27	7.30	3.57
2020	95.96	97.21	104.49	34.68	15.04	7.01	3.53

Table 4.12  
Rural 100 km/h arterial road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 100 km/h	% above 105 km/h	% above 110 km/h	% above 115 km/h
2006-2007	0.23	0.60	0.40	2.11	0.42	0.24	-0.01
2007-2008	-1.20	-1.00*	-1.45*	-4.63*	-3.90*	-1.62*	-0.70
2008-2009	0.10	0.00	-0.45	-0.51	-0.44	-0.35	0.01
2009-2010	-0.26	-0.25	-0.10	-0.91	-0.40	-0.65	-0.27
2010-2011	0.59	0.45	0.15	2.40	1.12	0.40	0.16
2011-2012	-0.84*	-0.75*	-0.95*	-4.44*	-3.79*	-1.57*	-0.95*
2012-2013	0.62	0.55	0.55	3.09	1.49	0.51	0.20
2013-2014	-0.09	-0.05	-0.35	0.09	-0.68	-0.43	-0.11
2014-2015	-0.35	-0.35	-0.60	-2.26	-1.47	-0.54	-0.16
2015-2016	-0.44	-0.38	-0.46	-2.20	-0.29	0.08	0.01
2016-2018	-0.71	-0.45	-0.21	-2.75	-1.27	-0.52*	-0.17*
2018-2020	0.13	-0.12	-0.19	-0.72	-0.23	-0.29	-0.04

\* statistically significant change ( $p < 0.05$ )



## 4.7 Rural 110 km/h arterial roads

The summary speed measurements for all free speed vehicles passing the measured sites for all the surveys are presented in Table 4.13 and the changes from one survey to the next in Table 4.14. Note that a 110 km/h site that had its speed limit reduced to 100 km/h in 2016 was identified in the current analysis resulting in slightly different results for the 2016 and 2018 surveys presented here compared to those presented in previous reports (where it was assumed the site remained at 110 km/h).

Table 4.13  
Rural 110 km/h arterial road free speed results by survey

Survey year	Mean speed	Median speed	85th percentile speed	% above 110 km/h	% above 115 km/h	% above 120 km/h	% above 125 km/h
2006	103.19	104.30	113.90	28.67	12.82	4.99	1.54
2007	103.82	104.95	114.30	29.83	13.15	4.89	1.87
2008	103.55	104.70	113.75	28.74	12.20	4.29	1.71
2009	103.55	104.75	113.65	28.78	12.17	4.11	1.64
2010	103.22	104.30	113.35	27.55	11.51	3.82	1.51
2011	103.79	104.90	113.55	28.11	11.90	4.05	1.67
2012	102.22	103.45	111.55	21.63	8.60	2.93	1.06
2013	102.35	103.60	111.70	22.71	8.48	2.94	1.07
2014	102.61	103.90	111.55	21.94	8.16	2.78	0.94
2015	102.44	103.55	111.25	20.78	7.75	2.71	0.95
2016	101.95	103.29	110.87	19.35	6.84	2.47	0.80
2018	101.47	102.71	109.88	16.46	5.64	2.09	0.64
2020	102.01	103.55	110.18	17.60	5.78	2.23	0.66

Table 4.14  
Rural 110 km/h arterial road free speed changes between surveys

Compared years	Mean speed	Median speed	85th percentile speed	% above 110 km/h	% above 115 km/h	% above 120 km/h	% above 125 km/h
2006-2007	0.63	0.65	0.40	1.15	0.32	-0.10	0.33
2007-2008	-0.27	-0.25*	-0.55*	-1.09*	-0.95*	-0.60*	-0.16*
2008-2009	-0.00	0.05	-0.10	0.04	-0.03	-0.18	-0.06
2009-2010	-0.33	-0.45	-0.30*	-1.23	-0.67*	-0.29*	-0.13*
2010-2011	0.57*	0.60*	0.20	0.56	0.39	0.24	0.15
2011-2012	-1.56*	-1.45*	-2.00*	-6.48*	-3.30*	-1.13*	-0.60*
2012-2013	0.13	0.15	0.15	1.08	-0.12	0.01	0.01
2013-2014	0.26	0.30	-0.15	-0.77	-0.31*	-0.16*	-0.14*
2014-2015	-0.18	-0.35	-0.30	-1.16	-0.41	-0.07	0.01
2015-2016	-0.49	-0.25	-0.38	-1.43	-0.91	-0.24	-0.14
2016-2018	-0.48*	-0.58*	-0.99*	-2.89*	-1.20*	-0.38*	-0.17*
2018-2020	0.54*	0.84*	0.30	1.14	0.14	0.14	0.03

\* statistically significant change ( $p < 0.05$ )

## 5 Discussion

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The following statistically significant changes in speed measurements between 2018 and 2020 were found:

- Adelaide 50 km/h local roads - increases in mean, median and 85th percentile speeds
- Adelaide 50 km/h collector roads - none (general increase in speeds)
- Adelaide 60 km/h arterial roads - none (general increase in speeds)
- Rural 50 km/h local roads - none (general increase in speeds)
- Rural hills 80 km/h arterial roads - none (general increase in speeds)
- Rural 100 km/h arterial roads - none (mixed speed changes)
- Rural 110 km/h arterial roads - increases in mean and median speeds

While these changes are the ones that we have some confidence in, they may be spurious (especially since so many changes are being examined) or they may be due to system wide effects in a specific year (weather or amount of travel). For these reasons, it is more important to examine the size and general direction of the changes over a long time period.

The following Sections (Figures 5.1-5.7) present a graphical overview of vehicle volume and speed changes over the course of the surveys for each of the road types examined.

The following general observations are apparent:

- Vehicle speeds have been trending down on all road types over the course of the surveys
- The percentage of vehicles obeying the speed limit has been increasing
- Reductions in high level speeding are more pronounced than those for low level speeding
- Vehicle speeds appear to be stabilising in recent years on 50-80 km/h roads while continuing to decline on 100-110 km/h roads
- Speed limit compliance is lowest on Adelaide 50 km/h collector roads and rural 100 km/h arterial roads
- Vehicle speeds in 2020 appeared to generally increase from 2018 especially on 50 and 110 km/h roads

The observed reductions suggest that the legislative, enforcement and media regimes of the last 19 years have slowly been pushing vehicle speeds in the right direction.

In conclusion, the current set of surveys provide useful information on trends in vehicle speeds in South Australia. A larger number of sites would allow more precise estimates to be made of speed changes but would entail considerable extra expense.

## The COVID-19 pandemic

No presentation of data collected in 2020 would be complete without exploring the potential effects of the COVID-19 pandemic and the associated restrictions on human movement.

The survey dates for the rural 100 and 110 km/h arterial roads ranged from 31 July 2020 to 28 August 2020. In South Australia, there were minimal restrictions in place during this time period (noting that international tourism ceased on 20 March 2020). However, from the 28 July 2020 and all the way through August, the South Australian border was closed to all travellers from Victoria (including returning SA residents) who were not classed as essential travellers.

This had an obvious effect on one 100 km/h site and four 110 km/h sites that were on roads leading into Victoria whereby traffic volumes were very much lower than previous years and speed distributions were quite different. It was decided to exclude these five sites from the 2020 analysis. The remaining 100 km/h sites showed traffic volumes in 2020 that were very similar to 2018. The remaining 110 km/h sites showed a 4 per cent reduction in traffic volumes in 2020 compared to those in 2018; this may have been a factor in the observed increase in speeds on 110 km/h roads.

The 50-80 km/h site survey dates ranged from 12 November 2020 to 18 November 2020 (only some rural 50 km/h sites) and from 24 November 2020 to 18 December 2020. South Australia was placed into a stay at home lockdown from 19 November 2020 to 21 November 2020, however, no sampling was done during this period. The greater than normal restrictions still in place after 21 November 2020 may have depressed traffic volumes but this is not readily apparent in the volume data collected.

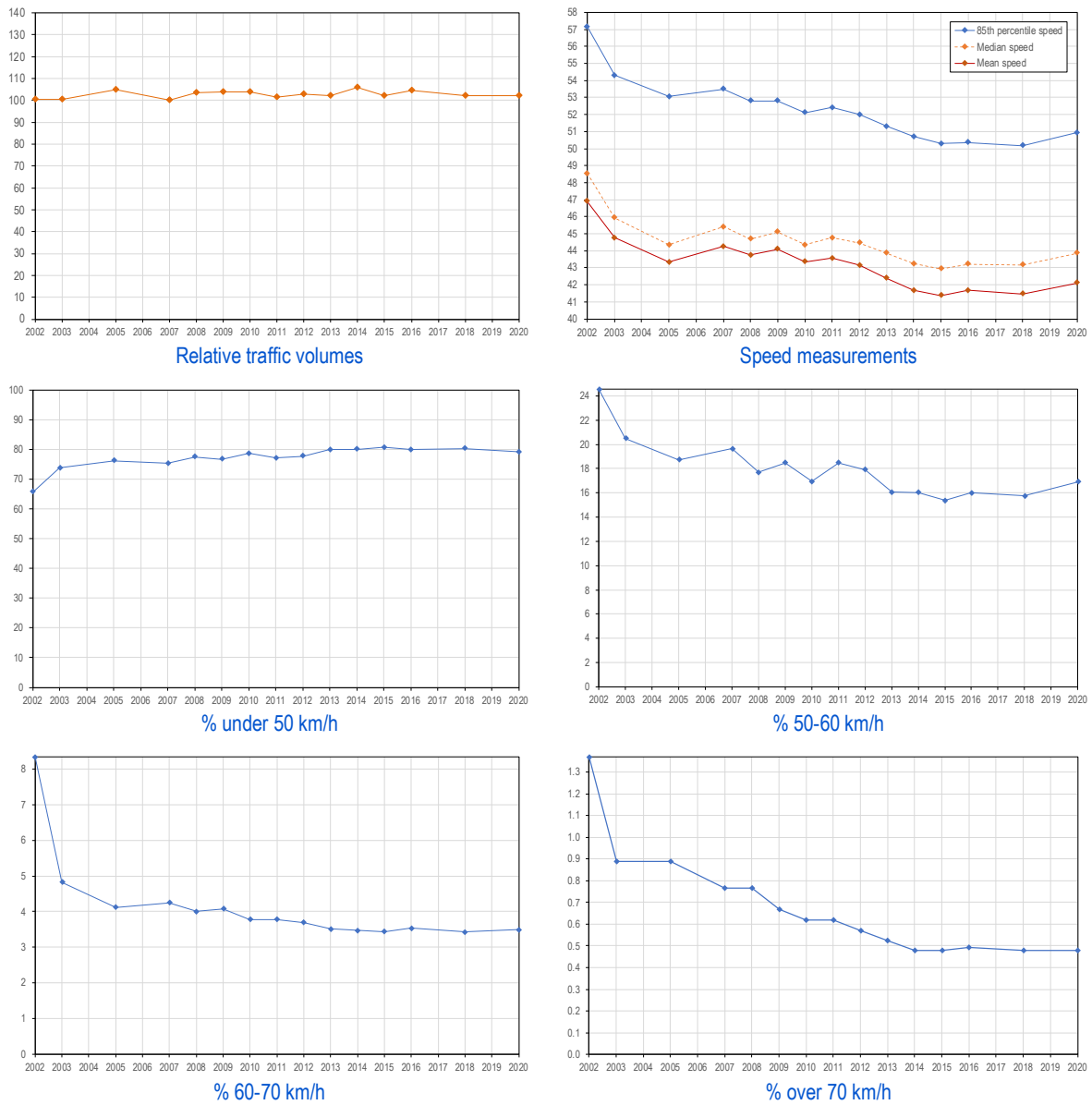
In general, lower traffic volumes would be expected to lead to higher speeds due to less congestion, less platooning and easier overtaking.

The psychological effect of the pandemic on driver choice of speed is unknown. Drivers may drive slower due to extra caution or may drive faster due to a lack of caution and a possible perceived reduction in enforcement levels. The data presented here suggests that drivers on low speed roads engaged in more low level speeding (up to 10km/h above the speed limit) but not high level speeding in the aftermath of a major lockdown.

Assuming the COVID-19 vaccine is widely administered and effective before August 2022, we would expect the previous trends in vehicle speeds to resume in future surveys. However, large changes in work at home rates and movements of people from city areas could well lead to fundamental changes in some areas.

## 5.1 Adelaide 50 km/h local roads

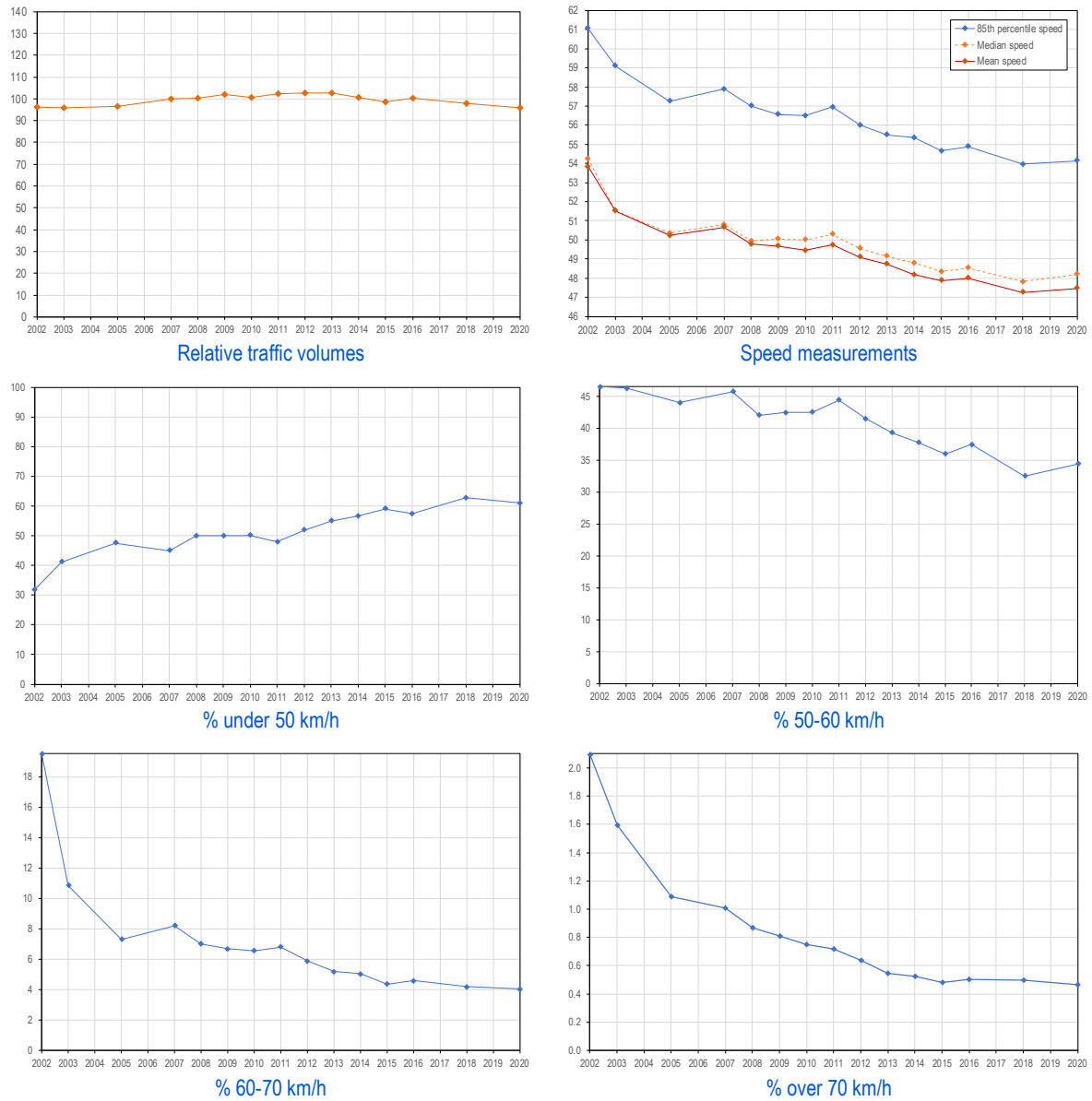
Figure 5.1  
Volume and summary speed measurements by survey year



Note that the speed limit on these roads was 60 km/h in 2002

## 5.2 Adelaide 50 km/h collector roads

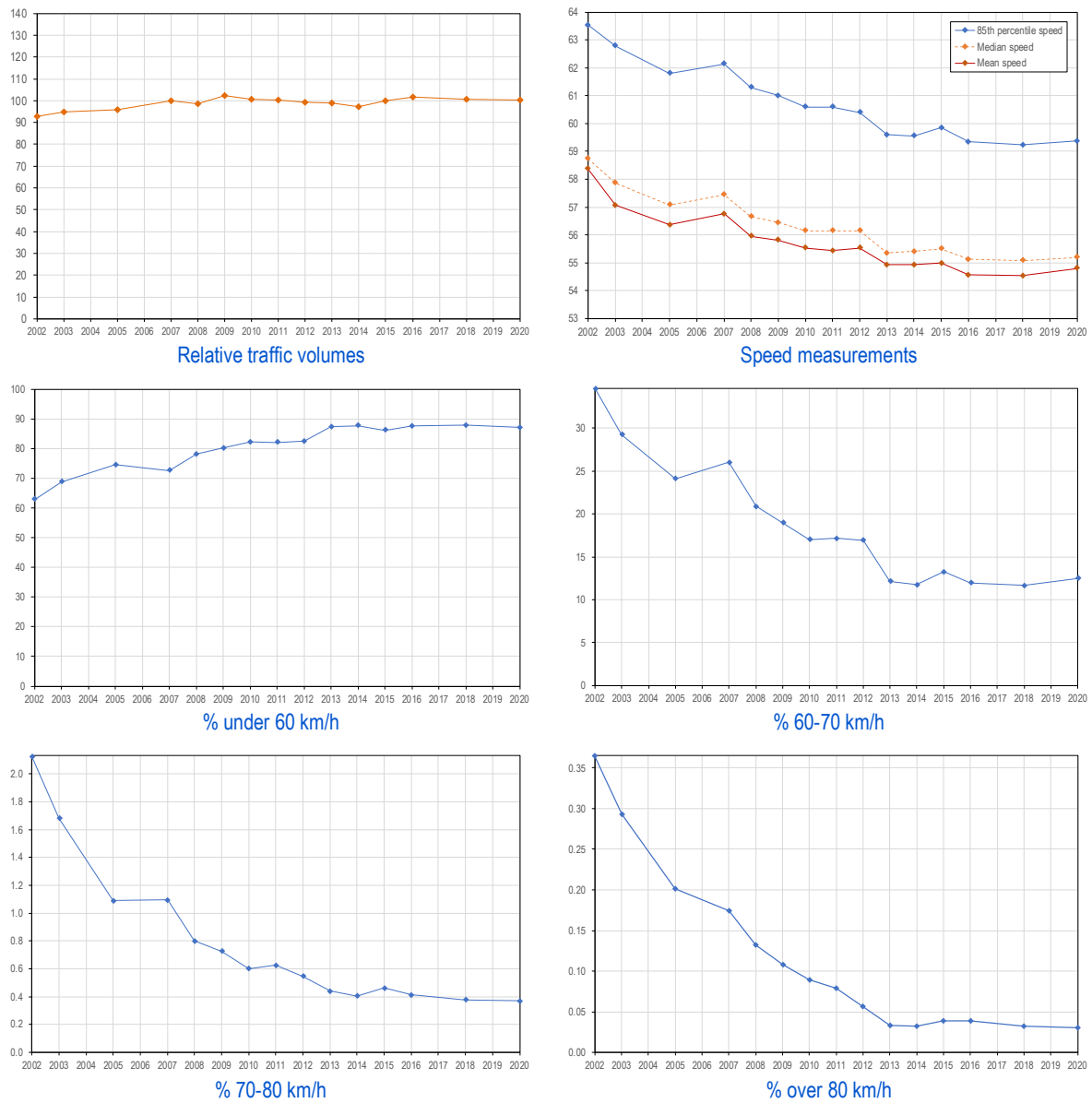
Figure 5.2  
Volume and summary speed measurements by survey year



Note that the speed limit on these roads was 60 km/h in 2002

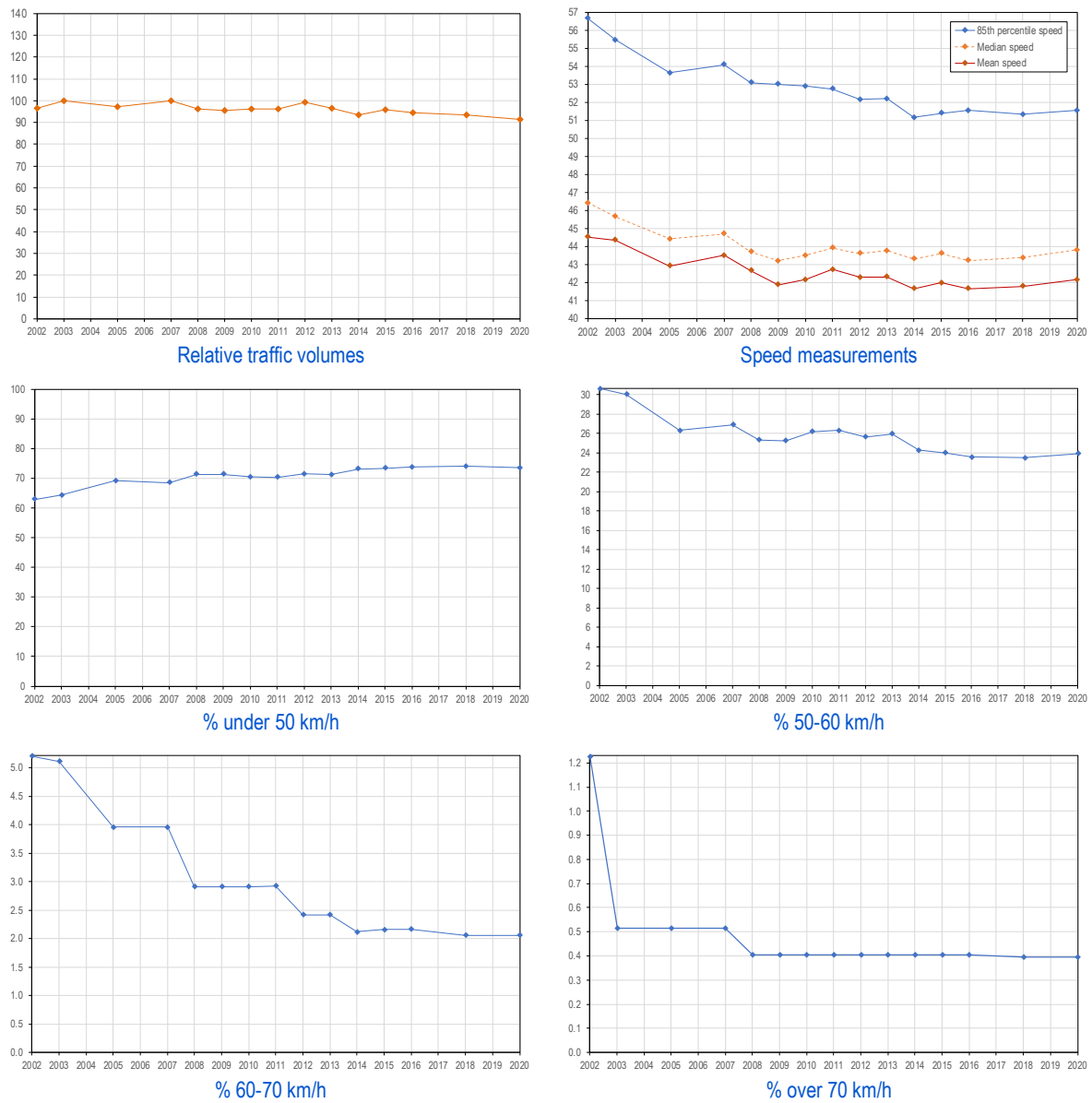
### 5.3 Adelaide 60 km/h arterial roads

Figure 5.3  
Volume and summary speed measurements by survey year



## 5.4 Rural 50 km/h local roads

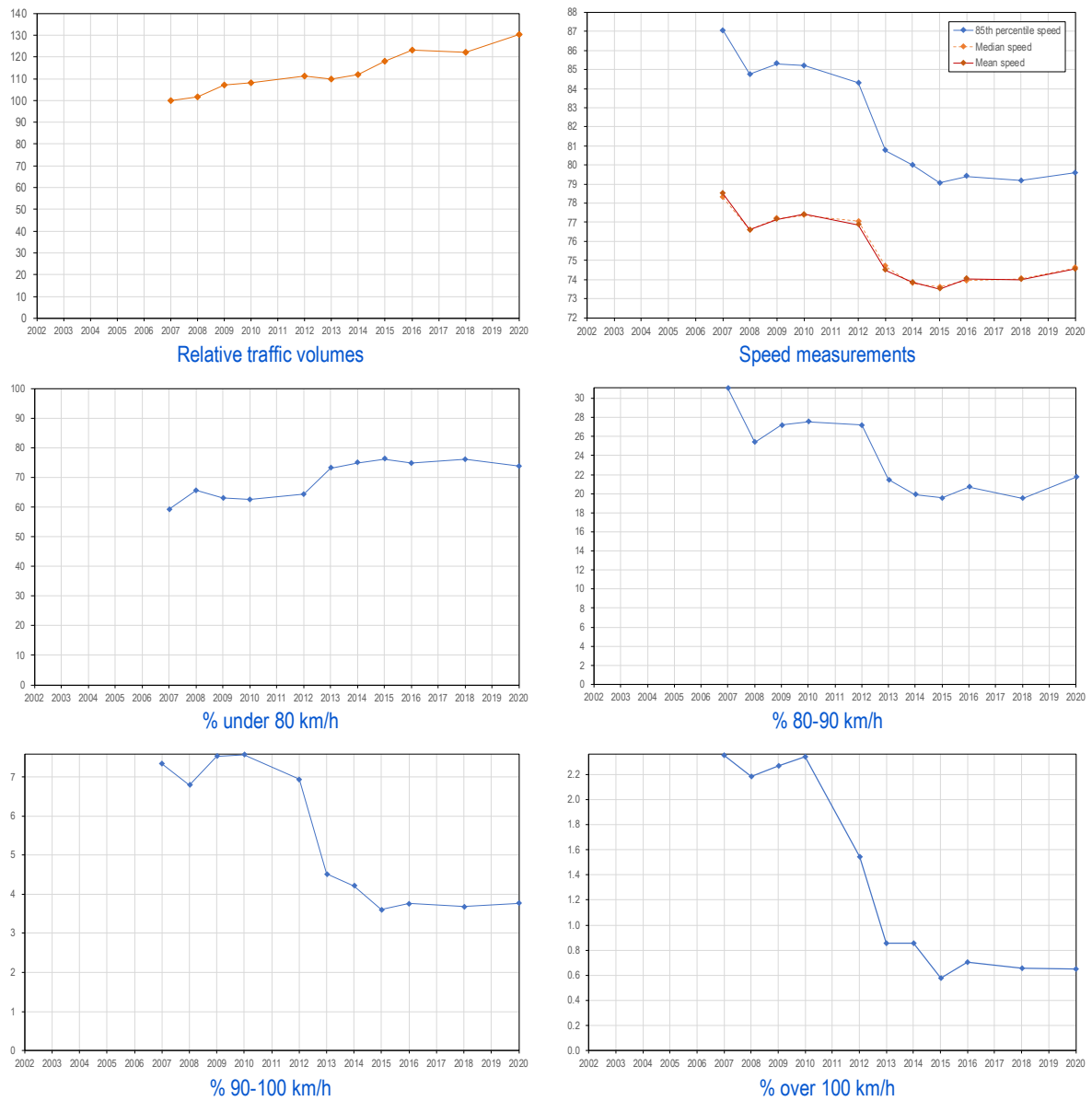
Figure 5.4  
Volume and summary speed measurements by survey year



Note that the speed limit on these roads was 60 km/h in 2002

## 5.5 Rural hills 80 km/h arterial roads

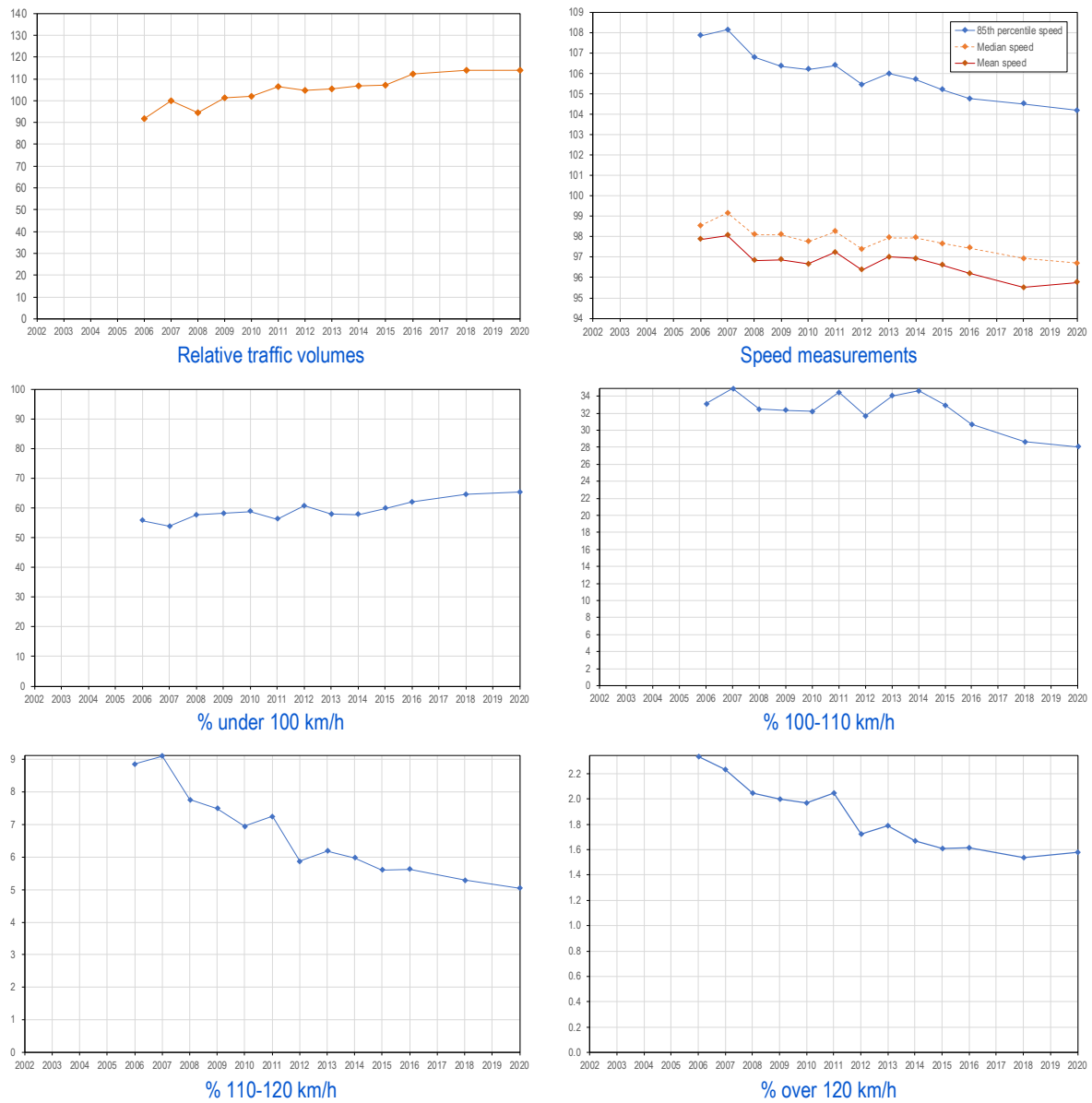
Figure 5.5  
Volume and summary speed measurements by survey year





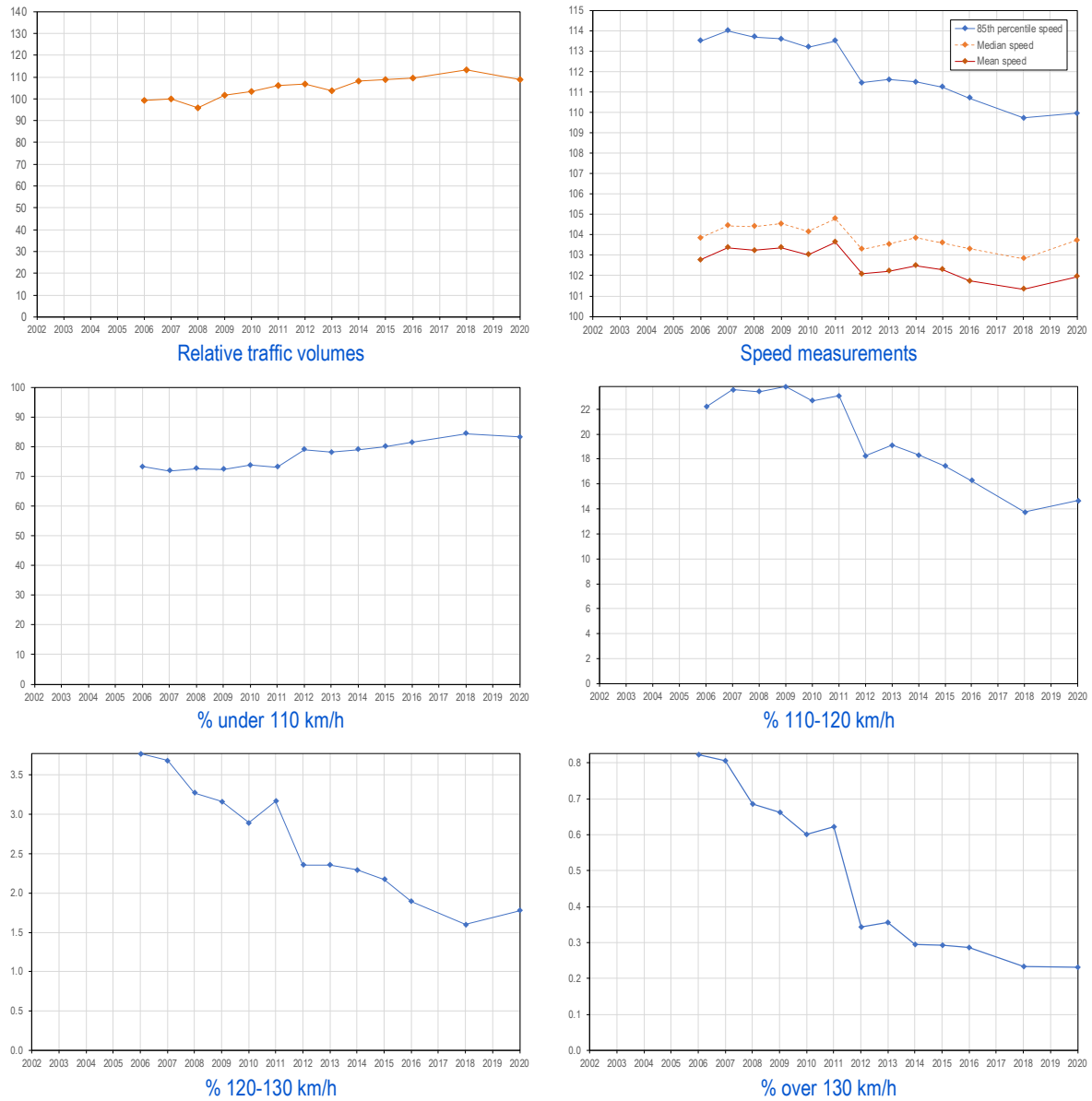
## 5.6 Rural 100 km/h arterial roads

Figure 5.6  
Volume and summary speed measurements by survey year



## 5.7 Rural 110 km/h arterial roads

Figure 5.7  
Volume and summary speed measurements by survey year



## Acknowledgements

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