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## Vehicle speeds in South Australia 2015

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## TITLE

Vehicle speeds in South Australia 2015

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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 year. This Report summarises the data collected in 2015 and makes comparisons with previous surveys and partial surveys dating back to 2002. Vehicle speeds on South Australian 50 km/h roads were essentially unchanged in 2015 compared to 2014. However, there has been a general downward trend in speeds on those roads since 2002 (although it is more pronounced in Adelaide than in rural areas). Vehicle speeds on Adelaide 60 km/h roads were essentially unchanged in 2015 compared to 2014 although there have been a large historical reduction in speeds. Vehicle speeds on rural hills 80 km/h roads were lower in 2015 than in 2014 continuing a reduction in speeds on those roads starting in 2013. Vehicle speeds on 100 and 110 km/h rural roads were essentially unchanged in 2015 compared to 2014 with both these road types showing very little change since surveys on them began in 2006 (although examination of the upper end speeds suggests that high end speeds are becoming less common on these roads over time).

## KEYWORDS

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

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## 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 yearly surveys.

More than 100 sites around South Australia have speed measurements taken for a one week period at the same time of year each 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 2015 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               |

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

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

Vehicle speeds on South Australian 50 km/h roads were essentially unchanged in 2015 compared to 2014. However, there has been a general downward trend in speeds on those roads since 2002 (although it is more pronounced in Adelaide than in rural areas).

Vehicle speeds on Adelaide 60 km/h roads were essentially unchanged in 2015 compared to 2014 although there have been a large historical reduction in speeds.

Vehicle speeds on rural hills 80 km/h roads were lower in 2015 than in 2014 continuing a reduction in speeds on those roads starting in 2013.

Vehicle speeds on 100 and 110 km/h rural roads were essentially unchanged in 2015 compared to 2014 with both these road types showing very little change since surveys on them began in 2006 (although examination of the upper end speeds suggests that high end speeds are becoming less common on these roads over time).

# Contents

---

- 1 Introduction ..... 1
- 2 Methodology..... 2
  - 2.1 Site selection ..... 2
  - 2.2 Data collected ..... 3
  - 2.3 Quantifying and testing speed changes..... 4
- 3 Speeds of all vehicles ..... 5
  - 3.1 Adelaide 50 km/h local roads..... 5
  - 3.2 Adelaide 50 km/h collector roads..... 6
  - 3.3 Adelaide 60 km/h arterial roads ..... 7
  - 3.5 Rural 50 km/h local roads ..... 8
  - 3.6 Rural hills 80 km/h arterial roads ..... 9
  - 3.7 Rural 100 km/h arterial roads ..... 10
  - 3.8 Rural 110 km/h arterial roads ..... 11
  - 3.9 Summary of changes in mean speed ..... 12
- 4 Speeds of free speed vehicles ..... 14
  - 4.1 Adelaide 50 km/h local roads..... 15
  - 4.2 Adelaide 50 km/h collector roads..... 16
  - 4.3 Adelaide 60 km/h arterial roads ..... 17
  - 4.5 Rural 50 km/h local roads ..... 18
  - 4.6 Rural hills 80 km/h arterial roads ..... 19
  - 4.7 Rural 100 km/h arterial roads ..... 20
  - 4.8 Rural 110 km/h arterial roads ..... 21
- 5 Discussion..... 22
  - 5.1 Changes in vehicle speeds..... 22
  - 5.2 Changes in vehicle free speeds..... 22
  - 5.3 Conclusions ..... 22
- Acknowledgements ..... 23
- References ..... 24

# 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 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 and 2014 (Kloeden and Woolley, 2010; Kloeden and Woolley, 2012; Kloeden and Woolley, 2012a; Kloeden and Woolley, 2013; Kloeden and Woolley, 2013a; Kloeden and Woolley, 2015).

This Report summarises the data collected in 2015 and compares it with previous surveys and partial surveys dating back to 2002.

Individual site details and measurements are available in an associated spread sheet to this report which can be found at: <http://casr.adelaide.edu.au/publications/list/?id=1669>

## 2 Methodology

### 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 spread sheet to this report which can be found at: <http://casr.adelaide.edu.au/publications/list/?id=1669>

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   |

\* these roads were 60 km/h in 2002

Table 2.2  
Number of speed survey measurements 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   |

\* these roads were 60 km/h in 2002

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 year thereafter for a full week mostly in November.

Additional sites were surveyed in 2007 for a full week mostly in August or November (see the associated spread sheet to this report for site sample months). Some of these sites were also sampled for a week in 2006.

Some sites had their sample 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 spread sheet 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 not surveyed by DPTI in 2015 and are not reported here. The data for these sites can be found in a previous report in this series (Kloeden and Woolley, 2015).

DPTI also conducted a series of yearly surveys at five 100 km/h rural sites and six 110 km/h rural sites that were included in previous reports. However, these surveys were not conducted in 2015.

## 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 DPTI 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)
- wheelbase (to nearest 0.1 m)
- 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 arterial roads with medians only had their median lanes measured and multilane 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 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 power of detecting speed changes).



### 3 Speeds of all vehicles

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 spread sheet to this report which can be found at: <http://casr.adelaide.edu.au/publications/list/?id=1669>

#### 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            |

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           |

\* 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            |

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*          |

\* 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.

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            |

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*           |

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

### 3.5 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            |

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            |

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

### 3.6 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            |

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*          |

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

### 3.7 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 some incorrectly classified sites from previous years were identified and corrected in the 2011 analysis (Kloeden and Woolley, 2013). This means the historical results presented here differ slightly from those in older reports in this series.

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             |

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            |

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

## 3.8 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 some incorrectly classified sites from previous years were identified and corrected in the 2011 analysis (Kloeden and Woolley, 2013). This means the historical results presented here differ slightly from those in older reports in this series.

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             |

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            |

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

### 3.9 Summary of changes in mean speed

The changes in mean speed on the various road types are shown graphically in Figures 3.1-3.4 with solid lines representing a statistically significant change in mean speed and dashed lines indicating a change that was not statistically significant.

Figure 3.1  
Changes in mean speed for 50 km/h roads (60 km/h in 2002)

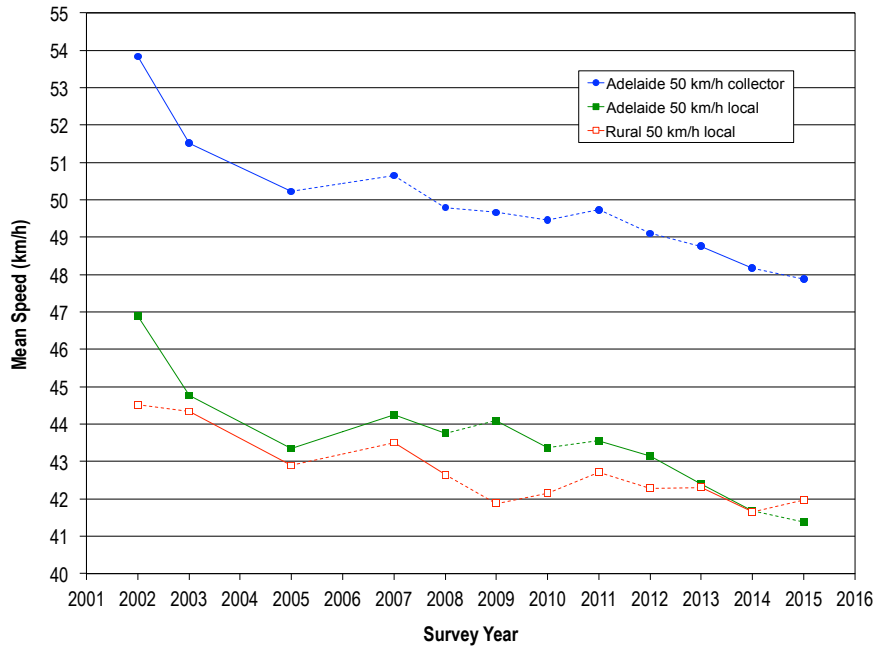


Figure 3.2  
Changes in mean speed for low speed roads

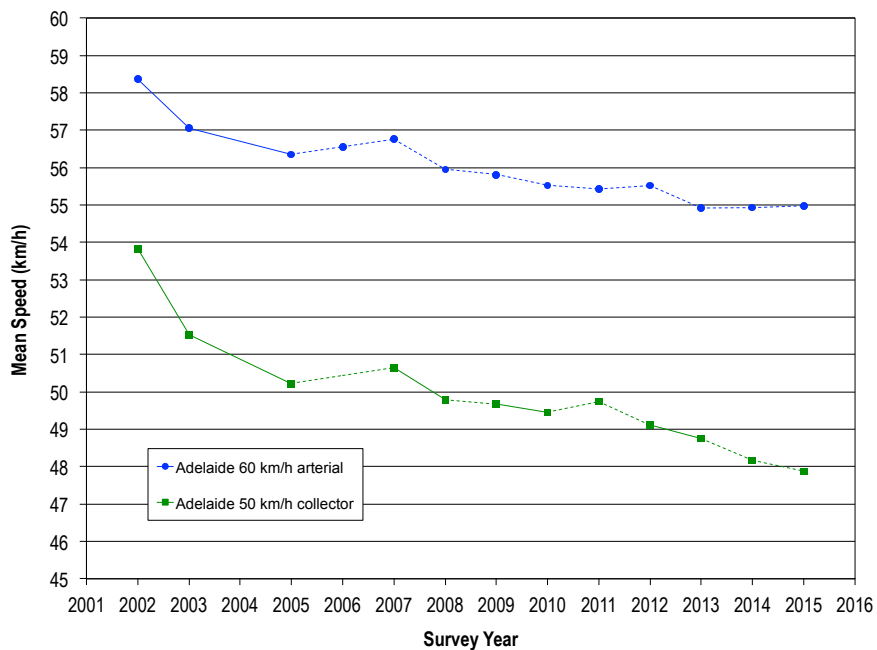




Figure 3.3  
Changes in mean speed for rural 80 km/h roads

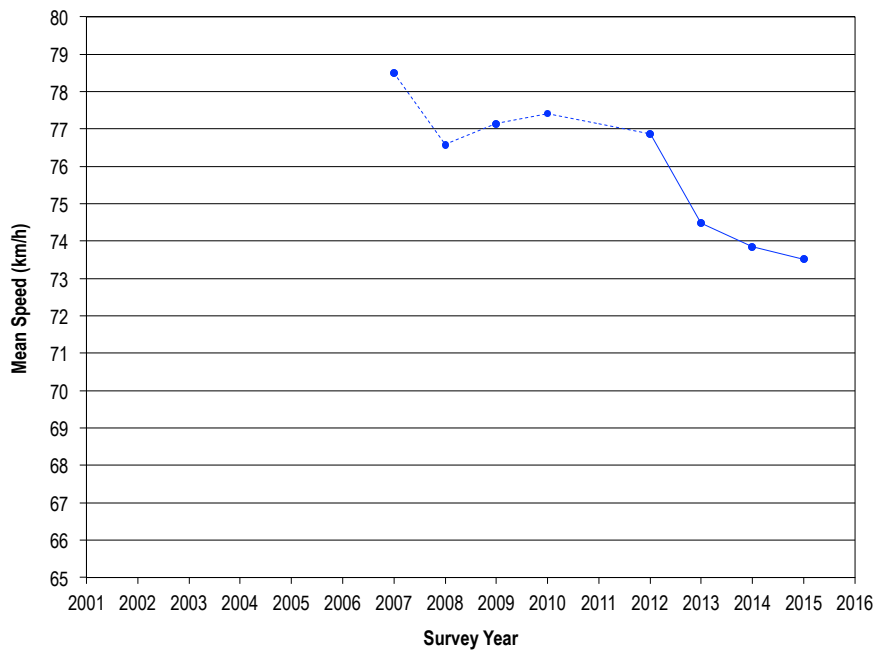
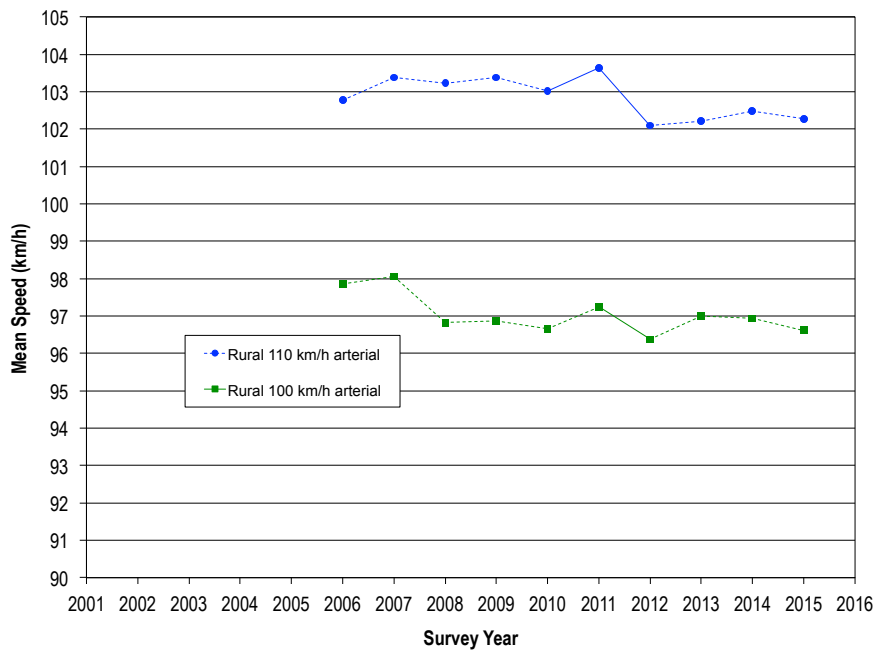


Figure 3.4  
Changes in mean speed for high speed roads



## 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.

## 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            |

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           |

\* 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            |

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*          |

\* 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.

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            |

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*           |

\* statistically significant change (p < 0.05)

## 4.5 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            |

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            |

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

## 4.6 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            |

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*          |

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

## 4.7 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 some incorrectly classified sites from previous years were identified and corrected in the 2011 analysis (Kloeden and Woolley, 2013). This means the historical results presented here differ slightly from those in older reports in this series.

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             |

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            |

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



## 4.8 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 some incorrectly classified sites from previous years were identified and corrected in the 2011 analysis (Kloeden and Woolley, 2013). This means the historical results presented here differ slightly from those in older reports in this series.

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             |

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             |

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

## 5 Discussion

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### 5.1 Changes in vehicle speeds

Vehicle speeds on South Australian 50 km/h roads were essentially unchanged in 2015 compared to 2014. However, there has been a general downward trend in speeds on those roads since 2002 (although it is more pronounced in Adelaide than in rural areas).

Vehicle speeds on Adelaide 60 km/h roads were essentially unchanged in 2015 compared to 2014 although there have been a large historical reduction in speeds.

Vehicle speeds on rural hills 80 km/h roads were lower in 2015 than in 2014 continuing a reduction in speeds on those roads starting in 2013.

Vehicle speeds on 100 and 110 km/h rural roads were essentially unchanged in 2015 compared to 2014 with both these road types showing very little change since surveys on them began in 2006 (although examination of the upper end speeds suggests that high end speeds are becoming less common on these roads over time).

### 5.2 Changes in vehicle free speeds

Restricting the analyses to just free speed vehicles (those with a headway of at least four seconds) produced 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.

Preference is given in this report for reporting the speeds of all vehicles rather than just free speed vehicles as it is felt that this better represents the total speed burden of all traffic. Free speeds are said to better capture driver intention changes. However, this is not strictly the case as only a biased proportion of drivers can be measured. It is conceivable that an increase in congestion in daytime traffic which does lower overall vehicle speeds could lead to an artefactual increase in free speeds due to faster night time traffic forming a larger part of the free speed vehicle category.

However, summary free speed vehicle tables are presented for comparison purposes and for use by those who require them.

### 5.3 Conclusions

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 expense.

Speeds on low speed roads have shown considerable reductions since 2002 suggesting that the legislative, enforcement and media regimes of the last 13 years have slowly been pushing vehicle speeds in the right direction. Recent positive effects are also being seen on rural hills 80 km/h roads as well.

However, vehicle speeds on 100 and 110 km/h rural roads have remained relatively stable although there are some indications of reductions in high level speeds.

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