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Evaluation of the use of 80 km/h advisory speed signs on unsealed roads in South Australia

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CASR REPORT SERIES

CASR130

November 2015

Report documentation

REPORT NO.	DATE	PAGES	ISBN	ISSN
CASR130	November 2015	29	978 1 921645 68 6	1449-2237

TITLE

Evaluation of the use of 80 km/h advisory speed signs on unsealed roads in South Australia

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AVAILABLE FROM

Centre for Automotive Safety Research
<http://casr.adelaide.edu.au/publications/researchreports>

ABSTRACT

A number of 80 km/h advisory speed signs were placed on unsealed roads in the Yankalilla area in South Australia in November 2014. As part of the evaluation of this trial, two weeks of vehicle speed measurement data was collected at 12 sites on these roads in June 2014 and again in January 2015. While the legal speed limit for these roads was 100 km/h, typical vehicle speeds at the measurement sites were well below this limit with typical mean speeds being around 60 km/h and only around 10 per cent of vehicles exceeding 80 km/h and less than 1% exceeding 100 km/h. Based on this, it is clear that a 100 km/h travel speed is not suitable for these roads and that an 80 km/h maximum advisory speed sign is not out of place. A reduction in vehicle speeds (using various measures) was found after the advisory speed signs were installed. However, the interpretation of this reduction is complicated by the seven month gap between the two surveys. There were significant changes in the road surface conditions between the surveys on some roads and in fact the roads with improved surfaces also tended to exhibit higher speeds. When roads with obviously changed surface conditions were taken out, the reduction in vehicle speeds was considerably greater. However, it is not possible to disentangle the seasonal effects from the effect of the advisory speed signs using the current data. Another survey conducted at the same locations in June 2015 would be useful as it would remove the seasonal effect from the comparison.

KEYWORDS

Vehicle speed, Speed limit, Driver behaviour, Rural road, Data analysis

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Summary

In South Australia unsealed roads currently fall under the general rural default speed limit of 100 km/h unless otherwise signed. Since very few are signed at present, the great majority of unsealed roads in South Australia have a 100 km/h speed limit. This is a very high limit, by international standards, for roads that are often of very low quality.

A number of 80 km/h advisory speed signs were placed on unsealed roads in the Yankalilla area in South Australia in November 2014. As part of the evaluation of this trial, two weeks of vehicle speed measurement data was collected at 12 sites on these roads in June 2014 and again in January 2015.

While the legal speed limit for these roads was 100 km/h, typical vehicle speeds at the measurement sites were well below this limit with typical mean speeds being around 60 km/h and only around 10 per cent of vehicles exceeding 80 km/h and less than 1% exceeding 100 km/h. Based on this, it is clear that a 100 km/h travel speed is not suitable for these roads and that an 80 km/h maximum advisory speed sign is not out of place.

A reduction in vehicle speeds (using various measures) was found after the advisory speed signs were installed. However, the interpretation of this reduction is complicated by the seven month gap between the two surveys.

There were significant changes in the road surface conditions between the surveys on some roads and in fact the roads with improved surfaces also tended to exhibit higher speeds. When roads with obviously changed surface conditions were taken out, the reduction in vehicle speeds was considerably greater.

However, it is not possible to disentangle the seasonal effects from the effect of the advisory speed signs using the current data. Another survey conducted at the same locations in June 2015 would be useful as it would remove the seasonal effect from the comparison.

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1 Introduction

In South Australia unsealed roads currently fall under the general rural default speed limit of 100 km/h unless otherwise signed. Since very few are signed at present, the great majority of unsealed roads in South Australia have a 100 km/h speed limit. This is a very high limit, by international standards, for roads that are often of very low quality.

A trial was conducted in the District Council of Yankalilla in 2014 that involved placing 80 km/h advisory speed signs on a number of unsealed roads in that area. Vehicle speed measurements were taken at selected sites on those roads before and after the signs were erected.

This report examines the speed data collected in order to ascertain the speed distribution of vehicles and to look for evidence that the advisory speed signs had an effect on vehicle speeds.

2 Methodology

In February 2014 a meeting was held between the Centre for Automotive Safety Research (CASR) and the South Australian Department of Planning, Transport and Infrastructure (DPTI) to discuss the possible evaluation of an upcoming 80 km/h advisory speed sign trial on selected unsealed roads in the District Council of Yankalilla area.

At that meeting, CASR advised that at least 10 sites on the affected roads should have speed measurements taken for a two week period just prior to the signs being erected and for a two week period soon after the signs were erected. Collection of speed data one year after the initial prior data collection was also suggested as an optional extension.

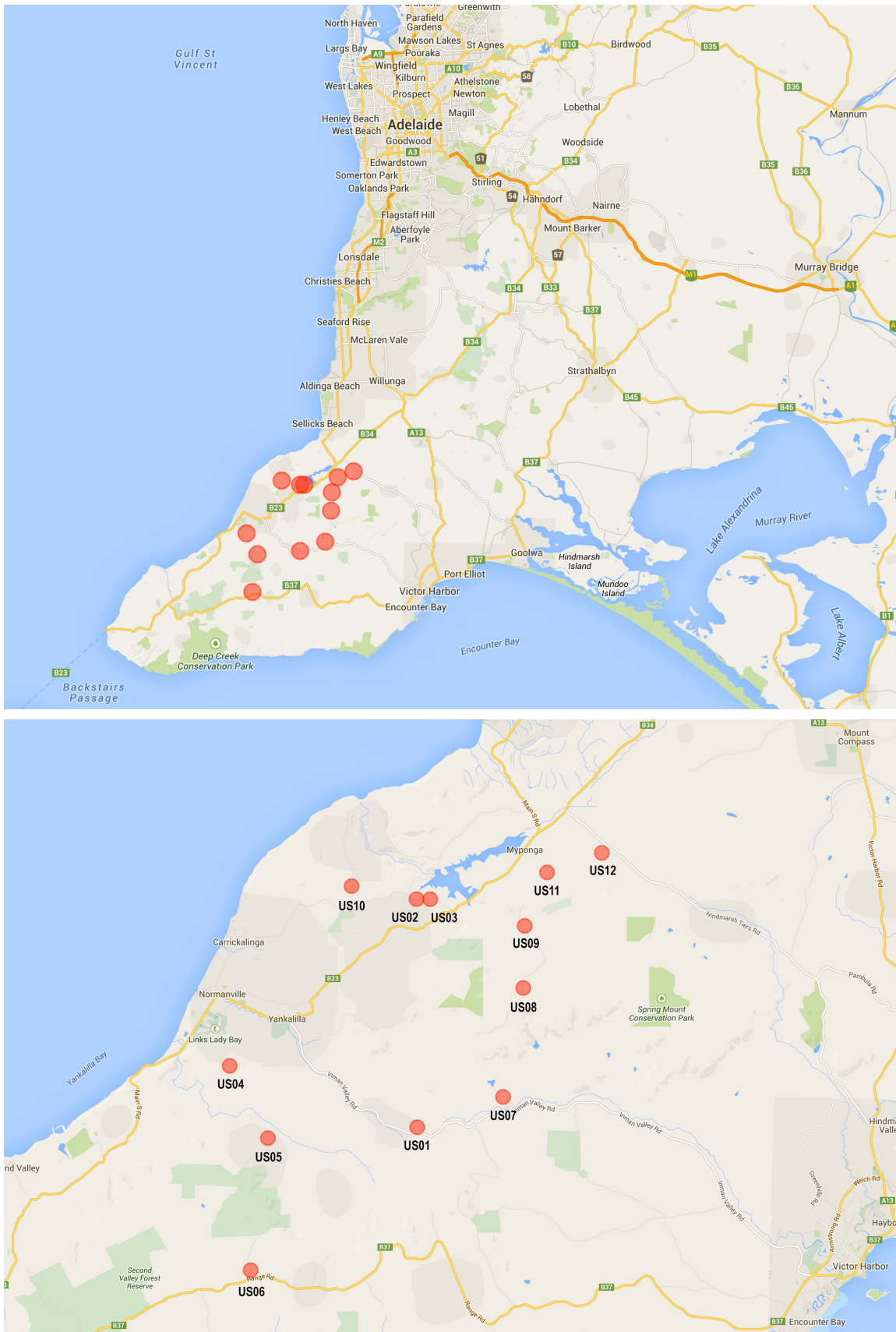
Initial speed surveys were carried out at 12 sites from 7 June 2014 to 26 June 2014 in anticipation of the signs being installed in July 2014. Unfortunately, the installation of the signs was delayed until November 2014 with the follow-up speed surveys being conducted from 17 January 2015 to 30 January 2015.

The 12 site locations are shown in Table 2.1 along with the direction of each road and the GPS coordinates of each location. The locations are mapped in Figure 2.1.

Table 2.1
Speed survey site locations

ID	Road Name	Direction	Latitude	Longitude
US01	Bald Hills Road	NS	-35.49960	138.41177
US02	Fork Tree Road (Reservoir Road end)	EW	-35.41120	138.41168
US03	Fork Tree Road (Southern end)	EW	-35.41112	138.41828
US04	Hay Flat Road (Abattoir end)	NS	-35.47577	138.32268
US05	Hay Flat Road (Mid site)	NS	-35.50374	138.33600
US06	Hay Flat Road (Southern end)	NS	-35.55473	138.33263
US07	James Track (after Martins Road)	EW	-35.48790	138.45270
US08	James Track (Mid site)	NS	-35.44557	138.46232
US09	James Track (Northern site)	NS	-35.42138	138.46297
US10	Myponga Beach Road	NS	-35.40613	138.38070
US11	Rowely Road (East end)	EW	-35.40085	138.47357
US12	Rowely Road (West end)	EW	-35.39330	138.49975

Figure 2.1
Speed survey site locations



Advisory speed signs were erected in November 2014 at each end of the affected roads or at the start of sections of road with speed limits above 80 km/h. An example sign is shown in Figure 2.2.

Figure 2.2
Advisory speed sign



The speed data was collected using MetroCount® pneumatic tube speed measuring devices and processed using the MTEExec version 4.06 software.

The traffic volume for each site in each direction in each survey was examined by hour of day and day of week to check for anomalous traffic and a typical 14 days period of data was chosen for each site in each survey period. Various speed measurements were then compared for each site between the surveys.

Given the seven month gap between the before and after measurements, the unsealed road surface conditions were subject to possible changes. The contractor made note of changed surface conditions between the surveys and these are shown in Table 2.2. See Appendix A for details of the sites during both surveys.

Table 2.2
Speed survey site changes between surveys

ID	Road Name	Changes in road surface from 2014 to 2015
US01	Bald Hills Road	Similar
US02	Fork Tree Road (Reservoir Road end)	Similar - less loose material
US03	Fork Tree Road (Southern end)	Similar - less loose material, some extra pot holes to East
US04	Hay Flat Road (Abattoir end)	Fewer pot holes
US05	Hay Flat Road (Mid site)	Fewer pot holes
US06	Hay Flat Road (Southern end)	Similar
US07	James Track (after Martins Road)	Less loose material and fewer pot holes
US08	James Track (Mid site)	Less loose material and fewer pot holes
US09	James Track (Northern site)	Fewer pot holes
US10	Myponga Beach Road	Similar
US11	Rowely Road (East end)	Similar - more rutting
US12	Rowely Road (West end)	Similar

3 Results

A full two weeks of traffic data was obtained for each of the 12 sites in each of the surveys apart from site US04 which only had one week of data collected in 2014 (the tubes had to be removed early due to a scheduled grading of the road). The number of vehicles detected in each survey for each site in each direction is shown in Table 3.1 along with average daily traffic flows and the percentage change in traffic flow from Jun 2014 to Jan 2015. All but two of the sites showed an increase in traffic flow with the average per site being a 22% increase. This is most likely due to seasonal differences with more traffic in summer than in winter.

Table 3.1
Vehicle counts by site, direction of travel and survey

Location	Vehicle count		Average daily traffic		% Change
	Jun 2014	Jan 2015	Jun 2014	Jan 2015	
US01N	468	520	33	37	11.1
US01S	473	533	34	38	12.7
US02E	1683	2269	120	162	34.8
US02W	1720	2335	123	167	35.8
US03E	1678	2279	120	163	35.8
US03W	1686	2330	120	166	38.2
US04N	689 *	1686	98	120	22.4
US04S	720 *	1686	103	120	17.1
US05N	746	977	53	70	31.0
US05S	798	1000	57	71	25.3
US06N	342	487	24	35	42.4
US06S	394	529	28	38	34.3
US07E	484	472	35	34	-2.5
US07W	471	471	34	34	0.0
US08N	515	546	37	39	6.0
US08S	540	557	39	40	3.1
US09N	1051	1165	75	83	10.8
US09S	1044	1175	75	84	12.5
US10N	565	1009	40	72	78.6
US10S	575	1002	41	72	74.3
US11E	471	439	34	31	-6.8
US11W	382	390	27	28	2.1
US12E	763	789	55	56	3.4
US12W	669	732	48	52	9.4
Average change for all sites					22.2

* This site only had data collected for seven days instead of 14

The mean vehicle speeds (km/h) for each site in each direction for both surveys are shown in Table 3.2. Also shown is the change in mean speed from June 2014 to January 2015 (km/h). The average change in mean speed was a reduction of 0.81 km/h. However, if only sites judged as having similar road surfaces in both surveys are considered the average change in mean speed was a reduction of 2.69 km/h.

Table 3.2
Mean vehicle speed by site, direction of travel and survey

Location	Jun 2014	Jan 2015	Change	Changes in road surface from 2014 to 2015
US01N	57.96	55.65	-2.31	Similar
US01S	57.59	56.26	-1.33	Similar
US02E	63.77	63.05	-0.71	Similar - less loose material
US02W	64.32	61.47	-2.84	Similar - less loose material
US03E	66.57	63.46	-3.11	Similar - less loose material, some extra pot holes
US03W	68.07	63.83	-4.24	Similar - less loose material, some extra pot holes
US04N	76.13	79.94	3.81	Fewer pot holes
US04S	73.78	72.97	-0.81	Fewer pot holes
US05N	60.55	64.54	3.99	Fewer pot holes
US05S	61.77	63.51	1.74	Fewer pot holes
US06N	63.42	62.13	-1.28	Similar
US06S	66.19	62.30	-3.89	Similar
US07E	60.82	59.85	-0.97	Less loose material and fewer pot holes
US07W	58.92	58.01	-0.91	Less loose material and fewer pot holes
US08N	61.79	65.68	3.88	Less loose material and fewer pot holes
US08S	61.13	68.97	7.84	Less loose material and fewer pot holes
US09N	67.08	68.80	1.72	Fewer pot holes
US09S	69.74	67.75	-1.99	Fewer pot holes
US10N	62.15	57.47	-4.69	Similar
US10S	65.23	62.80	-2.43	Similar
US11E	67.67	65.71	-1.97	Similar - more rutting
US11W	68.56	64.79	-3.77	Similar - more rutting
US12E	62.22	60.09	-2.13	Similar
US12W	62.77	59.78	-2.99	Similar
Average change for all sites			-0.81	
Average change for similar sites			-2.69	

Of particular note are the relatively low mean speeds (average of 64.5 km/h in June 2014 and 63.7 km/h in January 2015) given that the speed limit is 100 km/h. These roads are obviously not conducive to high speeds and drivers adjust their speeds accordingly.

The median vehicle speeds (km/h) for each site in each direction for both surveys are shown in Table 3.3. Also shown is the change in median speed from June 2014 to January 2015 (km/h). The average change in median speed was a reduction of 0.62 km/h. However, if only sites judged as having similar road surfaces in both surveys are considered the average change in median speed was a reduction of 2.28 km/h.

Table 3.3
Median vehicle speed by site, direction of travel and survey

Location	Jun 2014	Jan 2015	Change	Changes in road surface from 2014 to 2015
US01N	59.02	56.50	-2.52	Similar
US01S	58.04	56.64	-1.40	Similar
US02E	64.31	63.65	-0.66	Similar - less loose material
US02W	64.62	62.15	-2.47	Similar - less loose material
US03E	66.52	63.49	-3.03	Similar - less loose material, some extra pot holes
US03W	68.32	64.20	-4.12	Similar - less loose material, some extra pot holes
US04N	77.18	80.12	2.94	Fewer pot holes
US04S	75.24	73.36	-1.88	Fewer pot holes
US05N	60.61	65.17	4.56	Fewer pot holes
US05S	62.14	64.36	2.22	Fewer pot holes
US06N	64.30	61.82	-2.48	Similar
US06S	65.86	64.43	-1.43	Similar
US07E	60.49	60.61	0.12	Less loose material and fewer pot holes
US07W	59.44	58.29	-1.15	Less loose material and fewer pot holes
US08N	63.43	66.06	2.63	Less loose material and fewer pot holes
US08S	63.62	70.63	7.01	Less loose material and fewer pot holes
US09N	67.29	69.43	2.14	Fewer pot holes
US09S	70.44	68.87	-1.57	Fewer pot holes
US10N	61.91	58.06	-3.85	Similar
US10S	64.47	62.66	-1.81	Similar
US11E	68.93	66.98	-1.95	Similar - more rutting
US11W	69.01	65.85	-3.16	Similar - more rutting
US12E	62.60	61.24	-1.36	Similar
US12W	62.47	60.73	-1.74	Similar
Average change for all sites			-0.62	
Average change for similar sites			-2.28	

The 85th percentile vehicle speeds (km/h) for each site in each direction for both surveys are shown in Table 3.4. Also shown is the change in 85th percentile speed from June 2014 to January 2015 (km/h). The average change in 85th percentile speed was a reduction of 1.51 km/h. However, if only sites judged as having similar road surfaces in both surveys are considered the average change in 85th percentile speed was a reduction of 2.84 km/h.

Table 3.4
85th percentile vehicle speed by site, direction of travel and survey

Location	Jun 2014	Jan 2015	Change	Changes in road surface from 2014 to 2015
US01N	68.61	66.59	-2.02	Similar
US01S	68.13	66.67	-1.46	Similar
US02E	75.51	75.81	0.30	Similar - less loose material
US02W	74.83	73.47	-1.36	Similar - less loose material
US03E	78.95	75.11	-3.84	Similar - less loose material, some extra pot holes
US03W	81.09	75.89	-5.20	Similar - less loose material, some extra pot holes
US04N	91.29	94.33	3.04	Fewer pot holes
US04S	89.30	87.74	-1.56	Fewer pot holes
US05N	73.25	77.43	4.18	Fewer pot holes
US05S	74.25	74.94	0.69	Fewer pot holes
US06N	73.89	75.10	1.21	Similar
US06S	77.87	75.13	-2.74	Similar
US07E	71.53	68.83	-2.70	Less loose material and fewer pot holes
US07W	68.75	66.82	-1.93	Less loose material and fewer pot holes
US08N	76.29	76.84	0.55	Less loose material and fewer pot holes
US08S	77.64	80.47	2.83	Less loose material and fewer pot holes
US09N	79.95	80.38	0.43	Fewer pot holes
US09S	80.87	78.71	-2.16	Fewer pot holes
US10N	75.42	69.53	-5.89	Similar
US10S	79.71	74.61	-5.10	Similar
US11E	82.50	80.03	-2.47	Similar - more rutting
US11W	81.74	78.13	-3.61	Similar - more rutting
US12E	76.03	73.20	-2.83	Similar
US12W	79.91	75.21	-4.70	Similar
Average change for all sites			-1.51	
Average change for similar sites			-2.84	

The percentage of vehicles exceeding 80 km/h for each site in each direction for both surveys are shown in Table 3.5. Also shown is the change in the percentage from June 2014 to January 2015. The average change was a reduction of 2.09%. However, if only sites judged as having similar road surfaces in both surveys are considered the average change was a reduction of 3.84%.

Table 3.5
Per cent of vehicles over 80 km/h by site, direction of travel and survey

Location	Jun 2014	Jan 2015	Change	Changes in road surface from 2014 to 2015
US01N	0.64	0.96	0.32	Similar
US01S	0.63	1.13	0.49	Similar
US02E	6.77	8.24	1.47	Similar - less loose material
US02W	7.03	6.08	-0.95	Similar - less loose material
US03E	12.87	7.68	-5.19	Similar - less loose material, some extra pot holes
US03W	17.32	8.71	-8.61	Similar - less loose material, some extra pot holes
US04N	41.80	50.42	8.62	Fewer pot holes
US04S	37.64	31.55	-6.08	Fewer pot holes
US05N	5.23	8.90	3.68	Fewer pot holes
US05S	6.27	6.10	-0.17	Fewer pot holes
US06N	7.02	7.39	0.37	Similar
US06S	11.42	7.75	-3.67	Similar
US07E	2.27	1.27	-1.00	Less loose material and fewer pot holes
US07W	1.27	1.70	0.42	Less loose material and fewer pot holes
US08N	9.71	8.06	-1.65	Less loose material and fewer pot holes
US08S	10.74	16.34	5.60	Less loose material and fewer pot holes
US09N	14.94	15.45	0.51	Fewer pot holes
US09S	17.53	11.32	-6.21	Fewer pot holes
US10N	9.56	2.38	-7.18	Similar
US10S	14.43	7.39	-7.05	Similar
US11E	19.53	15.26	-4.27	Similar - more rutting
US11W	20.42	12.82	-7.60	Similar - more rutting
US12E	10.09	5.20	-4.90	Similar
US12W	14.65	7.65	-7.00	Similar
Average change for all sites			-2.09	
Average change for similar sites			-3.84	

Of particular note are the relatively small proportion of drivers exceeding 80 km/h on these roads (average of 12.5% in June 2014 and 10.4% in January 2015) given that the speed limit is 100 km/h. These roads are obviously not conducive to high speeds and drivers adjust their speeds accordingly.

The percentage of vehicles exceeding 100 km/h for each site in each direction for both surveys are shown in Table 3.6. Also shown is the change in the percentage from June 2014 to January 2015. The average change was a reduction of 0.29%. However, if only sites judged as having similar road surfaces in both surveys are considered the average change was a reduction of 0.30%.

Table 3.6
Per cent of vehicles over 100 km/h by site, direction of travel and survey

Location	Jun 2014	Jan 2015	Change	Changes in road surface from 2014 to 2015
US01N	0.21	0.00	-0.21	Similar
US01S	0.00	0.00	0.00	Similar
US02E	0.30	0.57	0.28	Similar - less loose material
US02W	0.70	0.30	-0.40	Similar - less loose material
US03E	1.55	0.53	-1.02	Similar - less loose material, some extra pot holes
US03W	1.60	0.52	-1.08	Similar - less loose material, some extra pot holes
US04N	9.72	13.52	3.80	Fewer pot holes
US04S	6.94	4.80	-2.14	Fewer pot holes
US05N	0.54	0.61	0.08	Fewer pot holes
US05S	0.50	0.00	-0.50	Fewer pot holes
US06N	0.29	1.44	1.14	Similar
US06S	1.27	0.00	-1.27	Similar
US07E	0.62	0.00	-0.62	Less loose material and fewer pot holes
US07W	0.21	0.21	0.00	Less loose material and fewer pot holes
US08N	0.78	0.92	0.14	Less loose material and fewer pot holes
US08S	0.93	0.54	-0.39	Less loose material and fewer pot holes
US09N	2.09	1.03	-1.06	Fewer pot holes
US09S	1.05	0.60	-0.46	Fewer pot holes
US10N	1.06	0.20	-0.86	Similar
US10S	2.09	1.40	-0.69	Similar
US11E	2.55	1.59	-0.95	Similar - more rutting
US11W	3.14	2.05	-1.09	Similar - more rutting
US12E	0.92	0.76	-0.16	Similar
US12W	2.54	0.96	-1.58	Similar
Average change for all sites			-0.29	
Average change for similar sites			-0.30	

Of particular note are the extremely small proportion of drivers exceeding 100 km/h on these roads (average of 0.9% in June 2014 and 0.6% in January 2015) given that the speed limit is 100 km/h. Drivers clearly consider that 100 km/h is an excessive speed for these roads.

4 Discussion

A number of 80 km/h advisory speed signs were placed on unsealed roads in the Yankalilla area in South Australia in November 2014. As part of the evaluation of this trial, two weeks of vehicle speed measurement data was collected at 12 sites on these roads in June 2014 and again in January 2015.

General speeds

While the legal speed limit for these roads was 100 km/h, typical vehicle speeds at the measurement sites were well below this limit with typical mean speeds being around 60 km/h and only around 10 per cent of vehicles exceeding 80 km/h and less than 1% exceeding 100 km/h. Based on this, it is clear that a 100 km/h travel speed is not suitable for these roads and that an 80 km/h maximum advisory speed sign is not out of place.

Speed changes

A reduction in vehicle speeds (using various measures) was found after the advisory speed signs were installed. However, the interpretation of this reduction is complicated by the seven month gap between the two surveys. Possible explanations for the observed changes are:

- The advisory speed signs did affect drivers' speed behaviour resulting in lower speeds
- There was a seasonal effect on speeds with higher speeds in winter and lower speeds in summer due to different weather and lighting conditions
- The drivers on these roads were different in summer and winter and had different speed behaviours
- The road surface conditions changed between the surveys due to maintenance of the road and this affected vehicle speeds
- The low traffic volumes made the observed speeds highly variable and the observed difference was due to chance

There were significant changes in the road surface conditions between the surveys on some roads and in fact the roads with improved surfaces also tended to exhibit higher speeds. When roads with obviously changed surface conditions were taken out, the reduction in vehicle speeds was considerably greater.

The consistency of the speed reductions on the roads with unchanged surface conditions suggests that the speed reduction is the result of more than chance alone.

However, it is not possible to disentangle the seasonal effects from the effect of the advisory speed signs using the current data. Another survey conducted at the same locations in June 2015 would be useful as it would remove the seasonal effect from the comparison.

Appropriate speeds

Determining an appropriate target speed for vehicles on a given road type is not a straightforward process. Lower speeds will lead to less crashes and injuries but at some point the speed will be unacceptably low from both amenity and public acceptance perspectives.

Current vehicle design and human biology mean that the risk of serious injury or death for vehicle occupants rises rapidly for frontal impacts above 70 km/h and side impacts above 50 km/h.

Rural sealed roads in South Australia have a default speed limit of 100 km/h. A car travelling at 100 km/h on a bituminised road will take 52 metres to brake to a stop (assuming a 0.75 coefficient of friction). Braking is less efficient on unsealed roads so to brake to a stop in 52 metres, a car would need to be travelling between 73 and 89 km/h (for coefficients of friction of 0.4 and 0.6).

Typical unsealed roads in South Australia also present other safety hazards. Pot holes and ruts in the road surface make vehicles less stable on the road. There is often vegetation very close to the edge of the roadway and roads can have numerous tight bends. These would all suggest a speed lower than the default 100 km/h speed limit should be adopted.

Internationally, not many countries have specific speed limits for unsealed roads. Some states in the USA have speed limits for unsealed roads ranging from 35-55 mph (56-89 km/h).

In Australia, Tasmania adopted 80 km/h as the default limit on rural unsealed roads in February 2014 and the NSW speed zoning guidelines permit the use of a regulatory 80 km/h speed limit on unsealed roads.

Given all of the above, a good case can be made for setting a default unsealed road speed limit of 80 km/h in South Australia with the ability to raise this limit for wide, high quality unsealed roads where appropriate.

The use of 80 km/h advisory speed signs on lower quality roads is a positive step towards this goal.

Conclusions

The following conclusions can be drawn from this study:

- Most drivers are already self limiting their speed on unsealed roads
- An 80 km/h advisory speed sign does seem appropriate for most of these roads
- Speed reductions were found to be associated with the installation of the advisory speed signs
- Seasonal effects cannot be ruled out as a sole explanation for the reductions
- A further survey in June 2015 would be useful
- There is a case for expanding the use of 80 km/h advisory speed signs
- Consideration should be given to placing 80 km/h speed limit signs on lower standard unsealed roads
- Consideration should be given to setting a default 80 km/h speed limit on unsealed roads generally

Acknowledgements

This study was funded by the South Australian Department of Planning, Transport and Infrastructure (DPTI) through a Project Grant to the Centre for Automotive Safety Research. The DPTI Project Manager was Tamra Fedojuk.

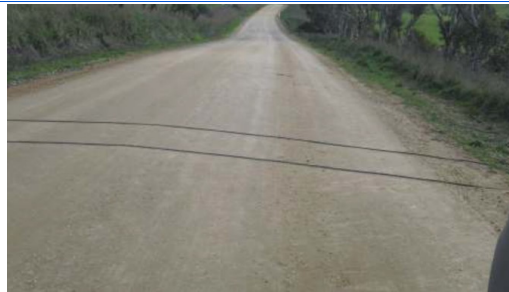
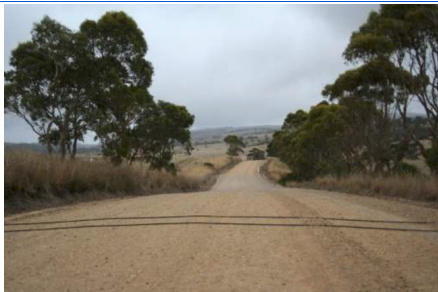


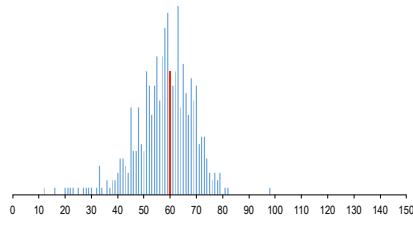
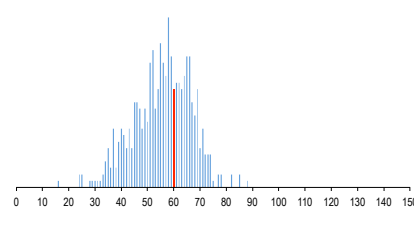
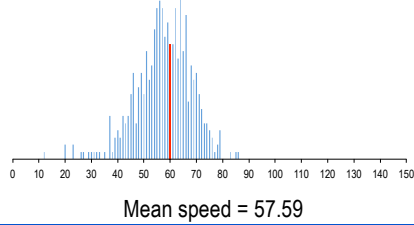
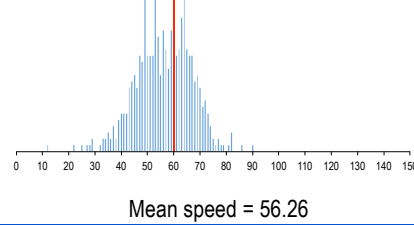
The Centre for Automotive Safety Research is supported by both the South Australian Department of Planning, Transport and Infrastructure and the South Australian Motor Accident Commission.

The views expressed in this report are those of the authors and do not necessarily represent those of the University of Adelaide or the funding organisations.

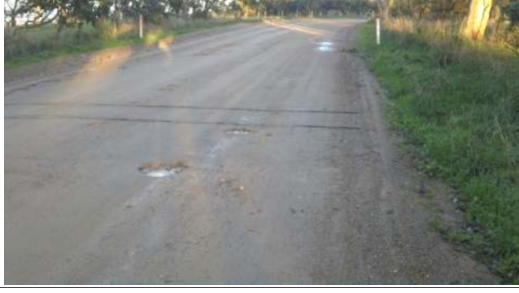
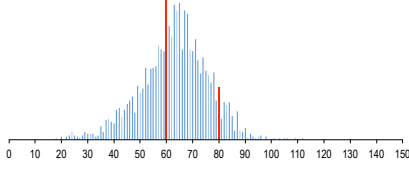
Appendix A – Site details

The following tables show the views from the measurement sites in each direction during each survey and the speed distributions for both directions of traffic for each survey.

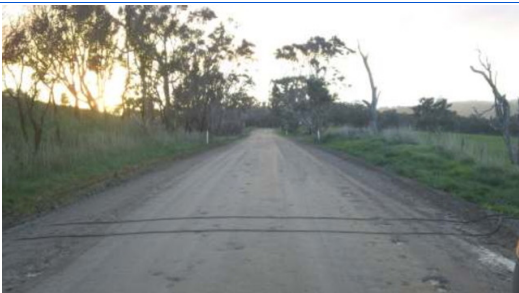

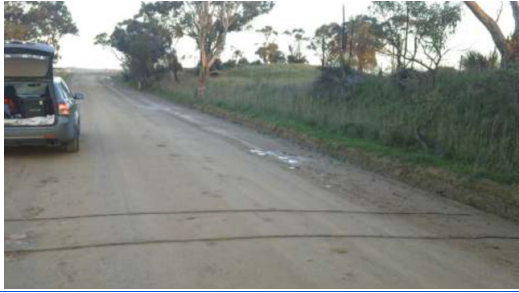
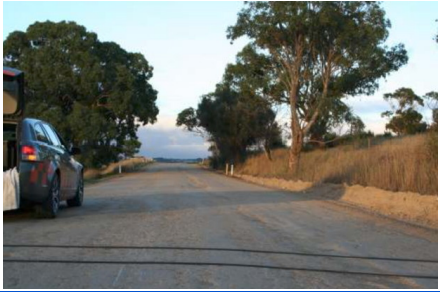
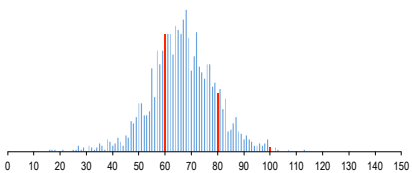
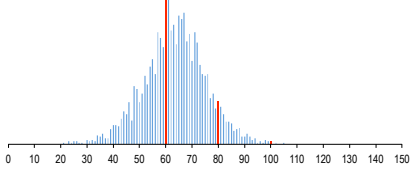
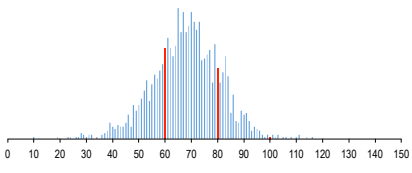
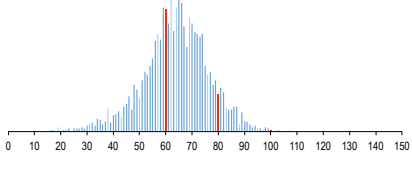
Site US01 - Bald Hills Road

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Very similar to last time.
North Bound Traffic Speeds	 <p>Mean speed = 57.96</p>	 <p>Mean speed = 55.65</p>
South Bound Traffic Speeds	 <p>Mean speed = 57.59</p>	 <p>Mean speed = 56.26</p>

Site US02 - Fork Tree Road (Reservoir Road end)

	June 2014	January 2015
Looking East		
Looking West		
Site change comment from data collector		Less loose material compared to last time. However road length generally in similar condition to last time.
East Bound Traffic Speeds	 <p>Mean speed = 63.77</p>	 <p>Mean speed = 63.05</p>
West Bound Traffic Speeds	 <p>Mean speed = 64.32</p>	 <p>Mean speed = 61.47</p>

Site US03 - Fork Tree Road (Southern end)

	June 2014	January 2015
Looking East		
Looking West		
Site change comment from data collector		Site similar to last time. Less loose gravel. Pot holes in the immediate area similar. Some significant longitudinal pot holes to the west which are expected to impact speeds.
East Bound Traffic Speeds	 <p>Mean speed = 66.57</p>	 <p>Mean speed = 63.46</p>
West Bound Traffic Speeds	 <p>Mean speed = 68.07</p>	 <p>Mean speed = 63.83</p>

Site US04 - Hay Flat Road (Abattoir end)

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Very smooth, fast and flat surface. Fewer pot holes. Expect high speeds.
North Bound Traffic Speeds	<p>Mean speed = 76.13</p>	<p>Mean speed = 79.94</p>
South Bound Traffic Speeds	<p>Mean speed = 73.78</p>	<p>Mean speed = 72.97</p>




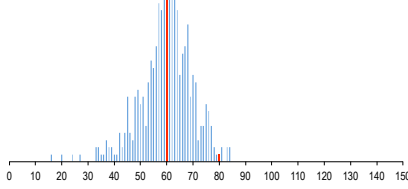
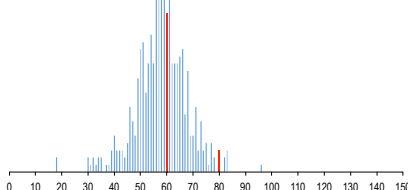
Site US05 - Hay Flat Road (Mid site)

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Smooth and flat with less pot holes compared to last time.
North Bound Traffic Speeds	<p>Mean speed = 60.55</p>	<p>Mean speed = 64.54</p>
South Bound Traffic Speeds	<p>Mean speed = 61.77</p>	<p>Mean speed = 63.51</p>

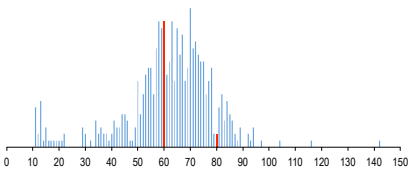
Site US06 - Hay Flat Road (Southern end)

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Loose gravel, very similar to last time.
North Bound Traffic Speeds	<p>Mean speed = 63.42</p>	<p>Mean speed = 62.13</p>
South Bound Traffic Speeds	<p>Mean speed = 66.19</p>	<p>Mean speed = 62.30</p>





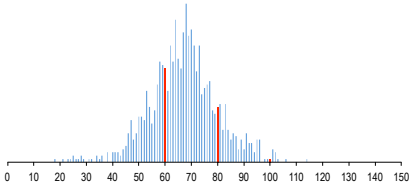
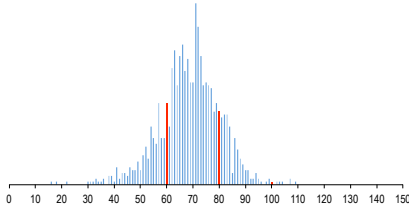
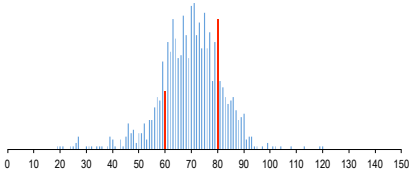
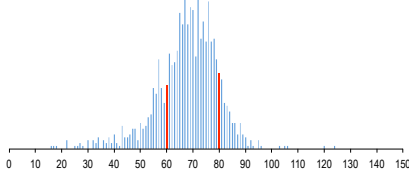
Site US07 - James Track (after Martins Road)

	June 2014	January 2015
Looking East		
Looking West		
Site change comment from data collector		Less loose gravel and less pot holes compared to last time. Not really conducive to higher speeds.
East Bound Traffic Speeds	 <p>Mean speed = 60.82</p>	 <p>Mean speed = 59.85</p>
West Bound Traffic Speeds	 <p>Mean speed = 58.92</p>	 <p>Mean speed = 58.01</p>

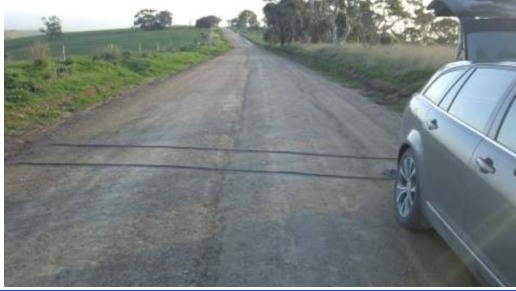


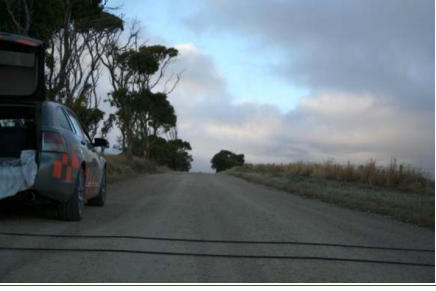
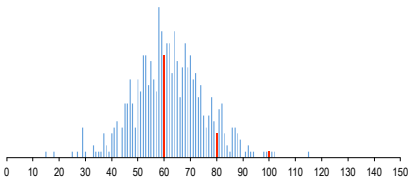
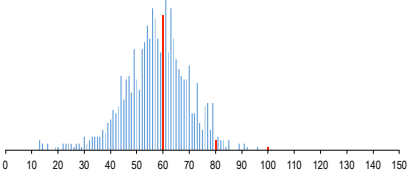
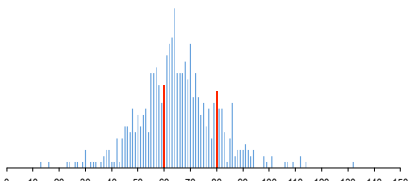
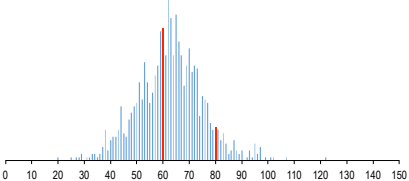
Site US08 - James Track (Mid site)

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Less pot holes compared to last time, and less loose gravel.
North Bound Traffic Speeds	 <p>Mean speed = 61.79</p>	 <p>Mean speed = 65.68</p>
South Bound Traffic Speeds	 <p>Mean speed = 61.13</p>	 <p>Mean speed = 68.97</p>

Site US09 - James Track (Northern site)

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Less pot holes compared to last time. May contribute to higher speeds.
North Bound Traffic Speeds	 <p>Mean speed = 67.08</p>	 <p>Mean speed = 68.80</p>
South Bound Traffic Speeds	 <p>Mean speed = 69.74</p>	 <p>Mean speed = 67.75</p>

Site US10 - Myponga Beach Road

	June 2014	January 2015
Looking North		
Looking South		
Site change comment from data collector		Similar to last time.
North Bound Traffic Speeds	 <p>Mean speed = 62.15</p>	 <p>Mean speed = 57.47</p>
South Bound Traffic Speeds	 <p>Mean speed = 65.23</p>	 <p>Mean speed = 62.80</p>

Site US11 - Rowely Road (East end)

	June 2014	January 2015
Looking East		
Looking West		
Site change comment from data collector		Loose gravel same as last time, but more rutting compared to last time.
East Bound Traffic Speeds	 <p>Mean speed = 67.67</p>	 <p>Mean speed = 65.71</p>
West Bound Traffic Speeds	 <p>Mean speed = 68.56</p>	 <p>Mean speed = 64.79</p>

Site US12 - Rowely Road (West end)

	June 2014	January 2015
Looking East		
Looking West		
Site change comment from data collector		Loose gravel same as last time.
East Bound Traffic Speeds	 <p>Mean speed = 62.22</p>	 <p>Mean speed = 60.09</p>
West Bound Traffic Speeds	 <p>Mean speed = 62.77</p>	 <p>Mean speed = 59.78</p>