Australian Government

Department of Infrastructure, Regional Development and Cities

Bureau of Infrastructure, Transport and Regional Economics

Modelling road safety in Australian states and territories

At a glance

This Information Sheet describes modelling of road fatality rates for the eight Australian States and Territories, and fatality and injury rates for Australia as a whole. The models are constructed 1) to allow an understanding of the past forces underlying the fatality rates in each jurisdiction covered, and 2) to allow forecasts of future trends in road safety – or rather its obverse, death and injury.

The major past influences lowering the road toll have been seat belt fitting and wearing, random breath testing, speed cameras, mobile drug testing, improvements in vehicles and infrastructure, and periods of economic uncertainty.

In the future, the forecast is for flat fatality rates per vehicle kilometre (in the absence of new safety measures) and increasing vehicle kilometres, leading to increasing fatalities. This is especially so for States such as Western Australia and the Northern Territory, where traffic growth is expected to be greater than in the rest of Australia.

Several measures that in the past have saved many lives each year (such as seatbelts) have limited capacity for expanded deployment. Improvements in vehicle and infrastructure safety are expected to be more than offset by increased car travel and distraction from mobile phones and other devices. New measures (such as photographic monitoring of mobile phone use, radical new vehicle safety technologies, enhanced speed, alcohol and drug enforcement, safety-targeted infrastructure improvements, etc.) will be required to offset the growth in fatalities associated with increased traffic volumes.

Modelling methodology

The dependent variables are fatality rates and injury rates. These are defined as deaths and injuries per billion safety-weighted vehicle kilometres travelled. The definition of death is a death within 30 days of a road accident involving a moving vehicle on a public road. The definition of injury is an injury serious enough to involve admission to hospital.

Vehicle kilometres travelled (VKT) have been weighted by risk factors for the different vehicle types to give a more realistic measure of 'exposure to death and injury'. The weights used for 'safety-weighted VKT' are: Cars and Light Commercial Vehicles 1.0, Buses 1.5, Trucks 2.0, and Motorcycles 26.0. So the 'fatality rate' is defined as 'deaths per billion safety-weighted VKT' and the 'injury rate' is defined as 'serious injuries per billion safety-weighted VKT'.

The Australian and State/Territory fatality rates are modelled using varying combinations of early 1960s/1970s dummy variables, seat belt wearing, enforcement variables (random breath testing, speed cameras, mobile drug testing – all smoothed and divided by safety-weighted VKT), mobile phone use per person, vehicle safety improvements, and infrastructure improvements. The Australian injury rate is modelled as a function of the fatality rate. An XL file on the BITRE website shows details of the variables and models.

This then is the analysis applied to Australia and each of the eight States/Territories. These models update two earlier analyses –a modelling with annual data (BITRE 2014, which gives details of the methodology, applied to 21 countries around the world) and a more detailed modelling with quarterly data that was done earlier still (BITRE 2010). The projections to 2030 from the current models are done on the assumptions of a freezing of enforcement effort per VKT and few new road safety measures coming into play – basically a "do nothing" scenario. Their usefulness lies in demonstrating the likely future trends if nothing is done – the road safety challenge.

Australian fatalities

For Australia, as for the States and Territories, fatality modelling is conducted in two stages. First, the fatality rate reductions from vehicle technology improvements and infrastructure improvements are roughly estimated. Then secondly, the fatality rate adjusted for these influences is calculated (higher than the raw fatality rate) and modelled.

The fatality rate adjustment for the improvement in vehicle safety is estimated to be -2.0 per cent in 2017 (and -1.0 per cent for the ACT), and is projected backwards and forwards using the natural logarithm of an estimate of the percent reduction in fatalities from vehicle safety improvements (Newstead et. al. 2016). The fatality rate adjustment for infrastructure improvement is estimated to be about -0.73 per cent in 2017 and is projected backwards and forwards using the real infrastructure spend (Gargett 2017).

The adjusted road fatality rate (subtracting the negative vehicle and infrastructure influences) is then modelled using the all-occupant seat belt wearing rate, the number of random breath tests (RBT,) speed camera enforcement, mobile drug testing (MDT), per person mobile phone use, fractional reductions in positive alcohol tests, the cumulative effects of recessions (safer driving), as well as a dummy variable (see Table A1). The results are shown in Table 1. Figure 1 shows the pattern of the Australian fatality rate is accurately predicted by the model (with the vehicle and infrastructure estimates added back in). Figure 2 shows the components of the Australian fatality rate prediction.

Table 1: Regression results for the adjusted Australian fatality rate, 1965 to 2017

	Coefficients	t-Statistic	
Constant	39.3	137	***
Seat belts	−0.270	−46.2	***
RBT	−4.60e–04	−2.94	**
Cameras	−7.12e–04	−1.21	
Dum6567[a]	4.75	10.1	***
MDT	−6.57e–04	−9.64e–02	
MPP[b]	2.80	2.35	*
Alcohol	−3.47	−1.63	
Cumulative recessions	-0.219	-1.23	
Observations	53		
R^2	0.9980		
Adjusted R^2	0.9977		
Residual Std Error	0.555		
F-Statistic	2775.57		

Note: Significance values: *** <0.001, ** <0.01, * <0.05, . <0.1.
a.   Dum6567 – 1965–1967 dummy variable
b.   MPP – Mobile phones per person.
Source: BITRE estimates.

Mapped onto the actual fatality rate, the major influence is the increase in seat belt wearing. From the early 1980s, RBT starts to have an effect, as do speed cameras from the early 1990s and mobile drug testing, mobile phone use (negatively), and vehicle improvements in the 2000s and 2010s. Economic recessions have an impact in the early 1980s and early 1990s.

The early 2010s saw a reduction in alcohol use when driving, as witnessed by significant declines in the percentage of fatalities with high blood alcohol and the percentage of RBT tests over the limit.

Figure 1: Actual/predicted Australian fatality rate
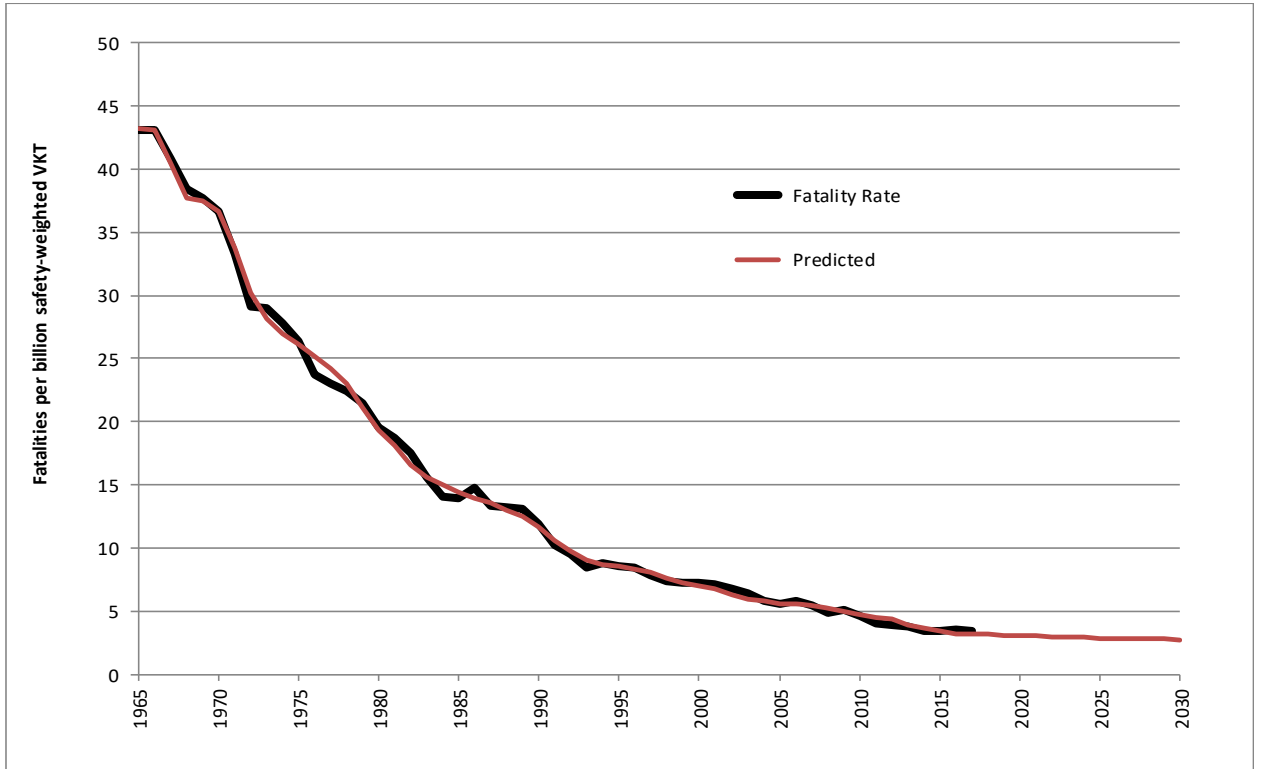
Source: BITRE estimates.

Figure 2: Components of the Australian fatality rate prediction
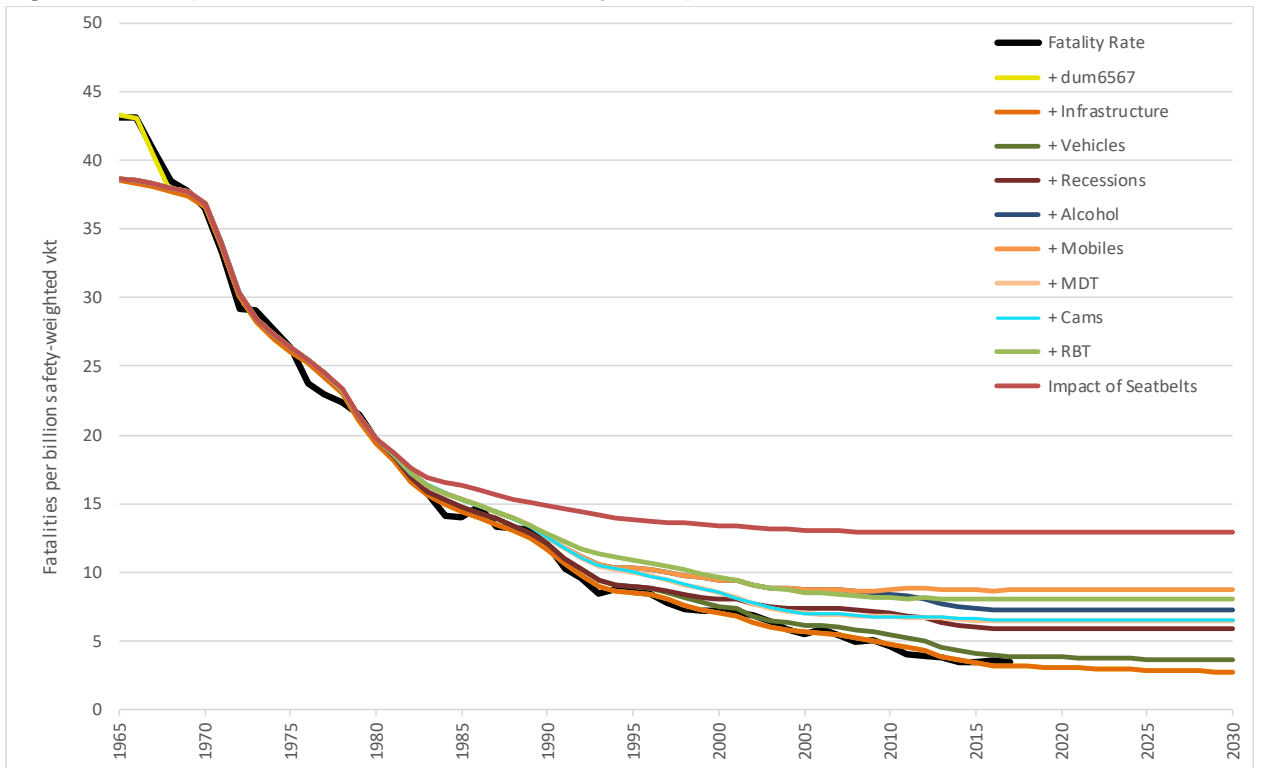
Source: BITRE estimates.

Table 2 shows a breakdown of predicted component changes for three periods – 2000 to 2010, 2010 to 2017 (both periods' totals normalised to the actual total changes), and predictions 2018 to 2030.

Table 2: Component-related changes in the number of annual fatalities over periods[a]

	Period	Belts	RBT	Cams	MDT	Mobiles	Alcohol	Vehicles	Infrastructure	Total	VKT change	Total change	Actual change
Estimated	2000–2010	−144	−310	−65	−13	301	−83	−318	−38	−670	406	−264	−387
Estimated	2010–2017	−16	−20	−44	−28	112	−410	−139	−34	−580	245	−335	−181
Predicted	2018–2030	0	0	0	−3	13	0	−140	−50	−181	346	166	–

a.   The difference between the number of fatalities per year at the end of the period and the number at the beginning.
Source: BITRE estimates.

The two past periods have seen measures saving more lives than claimed by increased traffic. However, out to 2030, 'business-as-usual' measures are unlikely to balance the increases in fatalities from growing traffic (which is expected to grow by one third from 2018 to 2030).

New measures (such as photographic monitoring of mobile phone use, radical new vehicle safety technologies, enhanced speed, alcohol and drug enforcement, safety-targeted infrastructure improvements, etc.) will be required to offset the growth in fatalities associated with increased traffic volumes.

This is apparent in Figure 3, which shows that the modelling produces a fairly accurate prediction of the level of fatalities over time. But Figure 3 also shows that predicted fatalities start to trend upwards from 2016, and are forecast to increase 20 per cent by 2030 as fatalities linked to traffic growth and increased mobile phone use outnumber fatality reductions from road safety measures (if unchanged).

Figure 3: Actual and predicted Australian road deaths
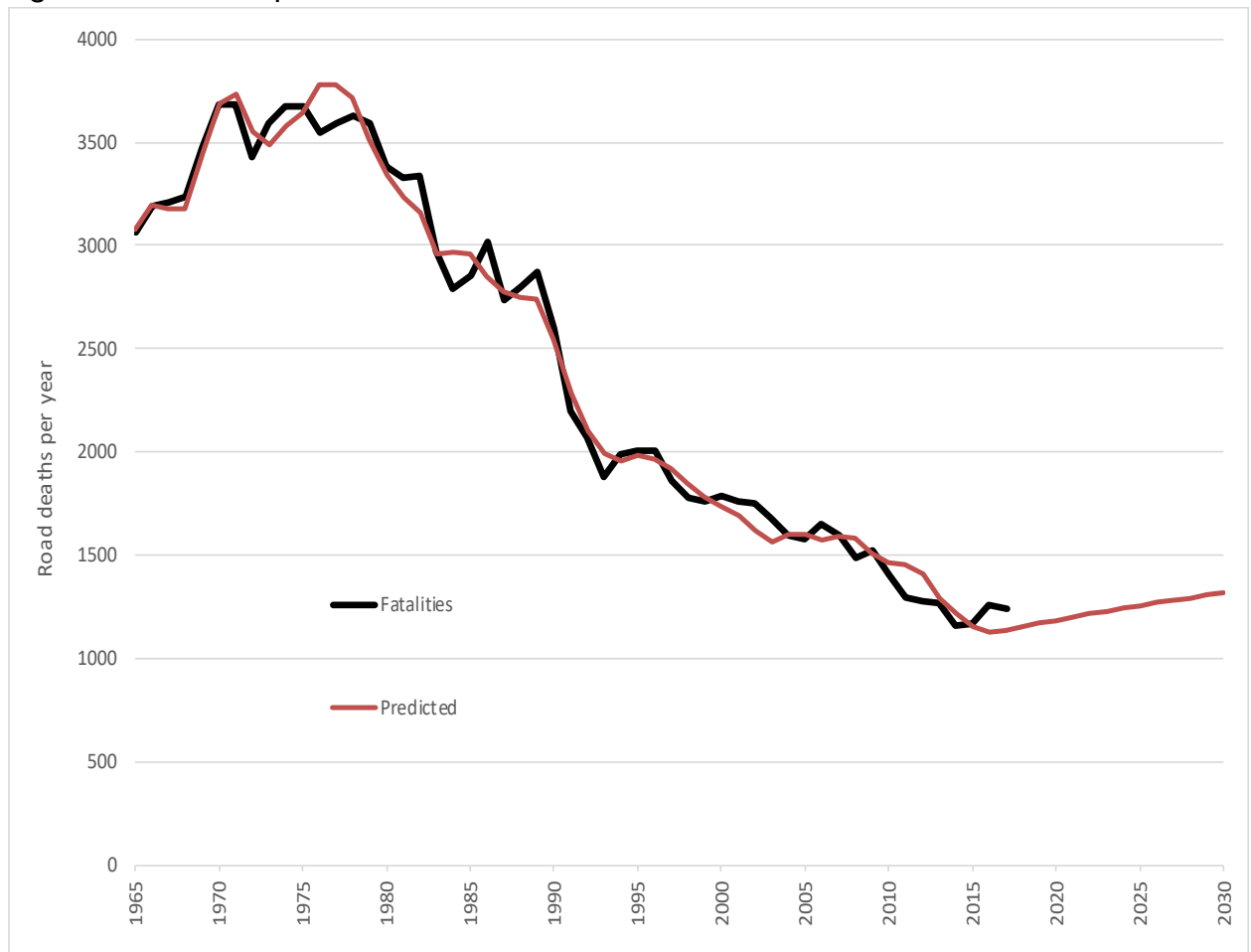
Source: BITRE estimates.

Australian injuries

In Australia, the injury rate (hospitalised road injuries per billion safety-weighted VKT) moved in sync with the fatality rate until the 2000s, after which time it ceased to move downward to the same extent. This is shown in Figure 4.

Figure 4: Australian injury and fatality rates
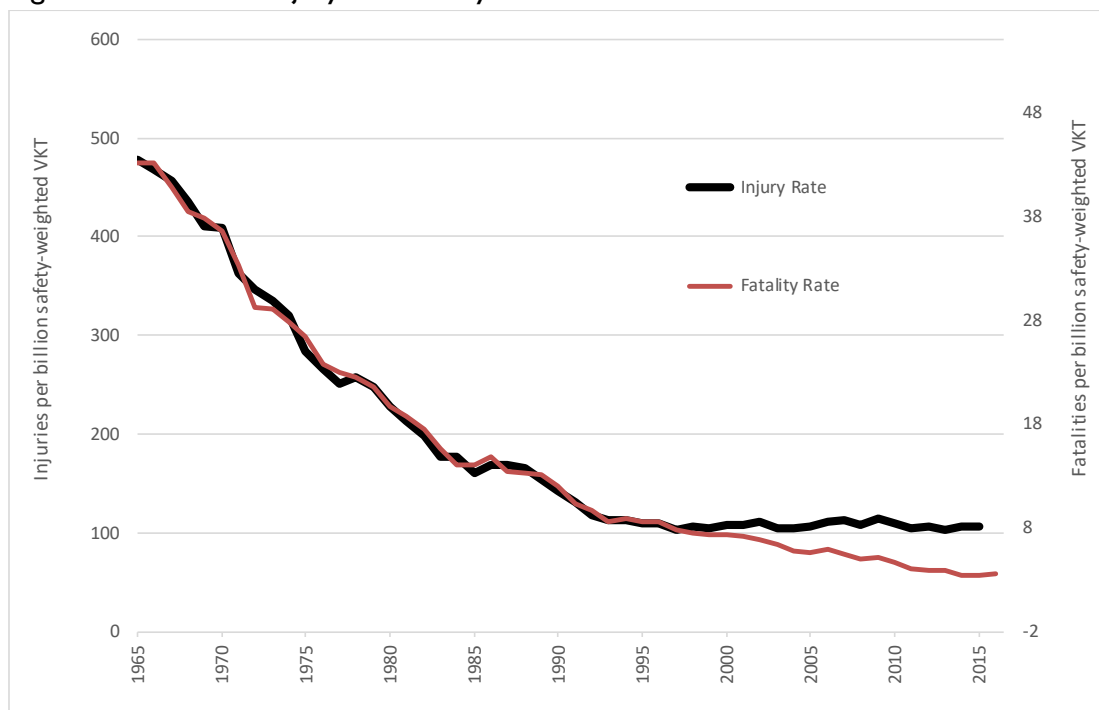
Source: BITRE estimates.

A model of the injury rate was constructed using the fatality rate and a time trend from 1997 to 2015. The regression results are shown in Table 3.

Table 3: Regression results for predicting the Australian injury rate, 1965 to 2015

	Dependent variable: Injury rate	
	Coefficients	t-Statistic
Constant	18.5	9.41 ***
Fatality rate	10.6	125 ***
Time9715	3.07	17.1 ***
Observations	51	
R^2	0.9988	
Adjusted R^2	0.9977	
Residual Std Error	5.69	
F-Statistic	10393.8 (df=2)	

Note: Significance: *** <0.001, ** <0.01, * <0.05, . <0.1.
c.   Dum6567 – 1965–1967 dummy variable
d.   MPP – Mobile phones per person.
Source: BITRE estimates.

Figure 5 shows the pattern of the injury rate is accurately predicted by the model. Figure 6 shows that the modelling also produces an accurate prediction of the number of injuries over time.

Figure 5: Actual and predicted Australian injury rate
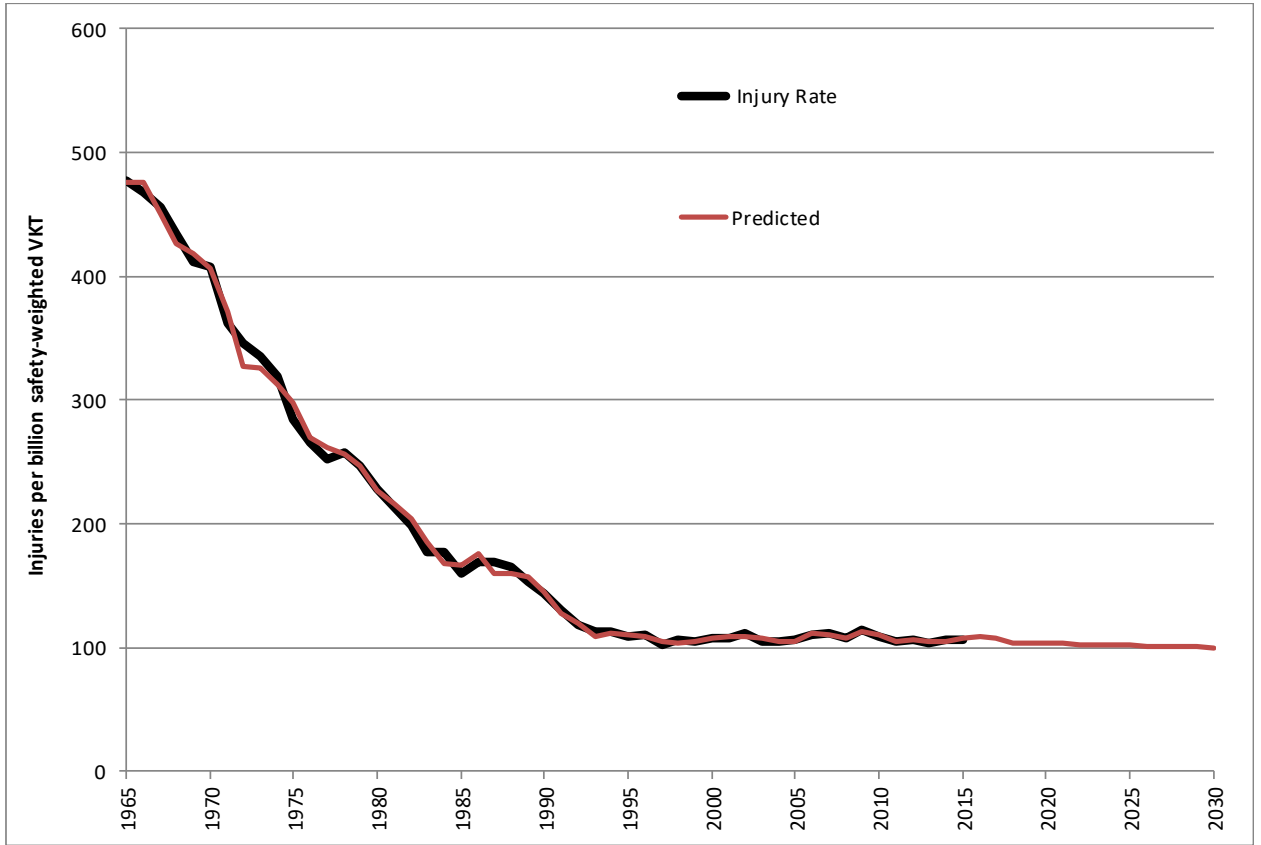
Source: BITRE estimates.

Figure 6: Actual and predicted Australian hospitalised road injuries

Source: BITRE estimates.

State/territory-base fatalities

Separate models of road fatality rates for each state and territory were also estimated. The results are presented in Table 4, and described below.

Table 4: Regression results for predicting state and territory fatality rates, 1965 to 2017

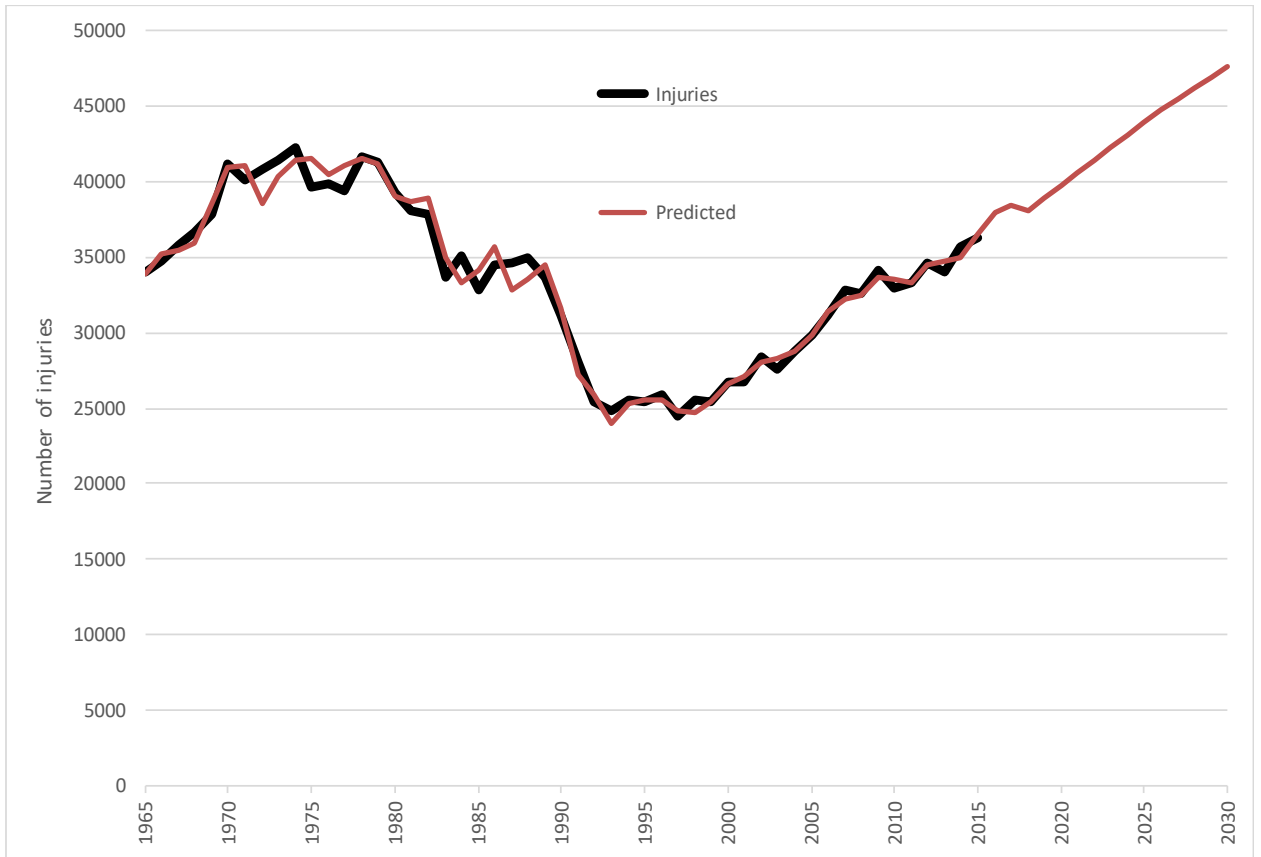|	State/territory							
	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
Constant	35.5*** (98.5)	43.6*** (92.6)	42.2*** (74.7)	32.0*** (65.0)	32.3*** (21.9)	43.5*** (40.8)	59.5*** (25.3)	28.1*** (31.9)
Seat belts	-0.208*** (-21.9)	-0.33*** (-38.4)	-0.337*** (-36.8)	-0.198*** (-19.7)	-0.235*** (-11.3)	-0.301*** (-15.1)	-0.364*** (-10.2)	-0.198*** (-12.5)
RBT	-4.92e-04*** (-4.42)	-2.48e-04 (-1.05)	-2.16e-04 (-1.38)	-1.02e-04 (-0.548)	-0.0173 (-0.695)	-1.31e-04 (-0.789)	-1.29e-04 (-0.255)	-5.91e-04** (-3.42)
Cameras	-1.64e-03** (-2.73)	-9.07e-04* (-2.03)	-6.01e-04 (-1.27)	-2.14e-03*** (-4.47)	-1.80e-04 (-1.05)	-1.64e-03 (-1.31)	-2.09e-03 (-1.31)	-2.25e-04 (-0.506)
MPP[a]	4.05** (3.1)	3.12* (2.33)	1.64 (0.644)					
Alcohol	-2.72 (-1.42)	-3.21 (-0.692)					-2.18 (-0.4)	
MDT[a]		-2.93e-03 (-0.45)	-7.88e-04 (-0.069)		-3.08e-03 (-0.619)	-0.0103 (-0.64)		-0.0475 (-0.765)
GLS[a]			-0.535 (-0.496)					
Cumulative recessions	-0.202 (-0.831)	-0.109 (-0.306)		-0.162 (-0.599)				
Trend Pre-1969	1.89*** (15.7)							
Trend Pre-1967		2.13*** (6.99)	1.7*** (4.16)					
Dum66[b]							41.0*** (6.13)	
DumPre74[b]b					5.64*** (4.17)			
Dum7382[b]	2.14*** (5.63)							
Dum7783[b]								-2.59* (-2.33)
Dum9401					0.898 (1.35)			
DumHI[b]							6.48 (1.4)	
Dum0305[b]								-1.34 (-0.628)
Dum0708[b]					1.37 (1.32)			
Dum110km[b]		1.77* (2.63)						
Observations	53	53	53	53	53	53	53	53
R^2	0.9979	0.9959	0.9909	0.9765	0.9845	0.9740	0.8808	0.9295
Adjusted R^2	0.9975	0.9950	0.9895	0.9745	0.9821	0.9445	0.8653	0.9203
Residual Std Error	0.559	0.889	1.257	1.330	1.380	2.871	6.309	2.309
F-Statistic	2588.2 (df=8)	1163.9 (df=9)	703.6 (df=7)	498.4 (df=4)	407.8 (df=7)	222.14 (df=4)	56.65 (df=6)	101.04 (df=6)

Note: Significance values: *** <0.001, ** <0.01, * <0.05, . <0.1. t-Statistics shown in parentheses.
a. MPP – Mobile phones per person, MDT – Mobile drug testing, GLS – Graduated licensing system.
b. Dummy variables: Dum66 – 1966, Dum7382 – 1973–1982, DumPre74 – 1965–1974, Dum7783 – 1977–1983, DumHI – Variable size dummy, 2000–2012, Dum0304 – 2003–2004, Dum0708 – 2007–2008, Dum110km – 110km/h speed limit dummy.
Source: BITRE estimates.

New South Wales fatalities

For New South Wales, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, measures of random breath testing (RBT), speed cameras, per person mobile phone use, reductions in positive alcohol tests, the cumulative effects of recessions, as well as dummy variables (see Table A2). The results are shown in Table 4 and Figure 7.

Figure 7: Actual/predicted NSW fatality rate
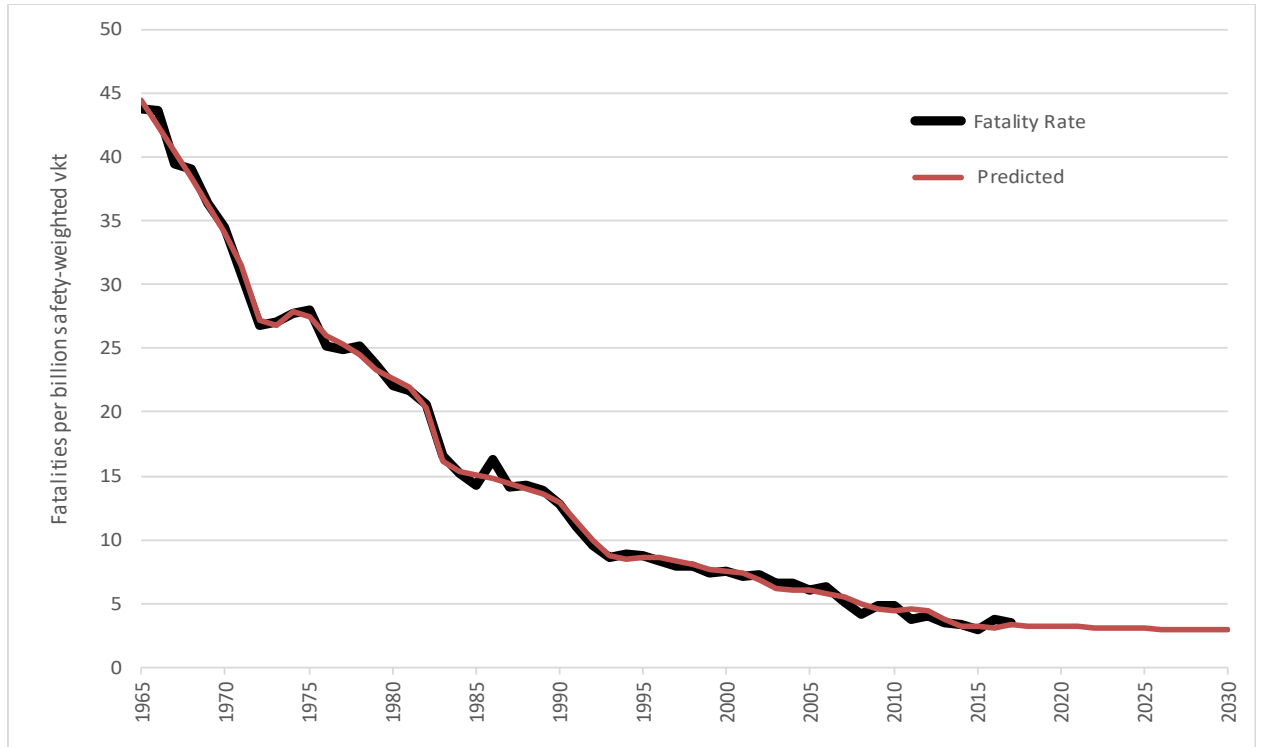
Source: BITRE estimates.

Figure 8 shows the components of the NSW fatality rate prediction/forecast. The major influence is the increase in seat belt wearing. From the early 1980s, random breath testing starts to have an effect, as do speed enforcement and other variables from the 1990s and 2000s.

Figure 9 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 8: Components of the NSW fatality rate prediction

Source: BITRE estimates.

Figure 9: Actual/predicted NSW road deaths
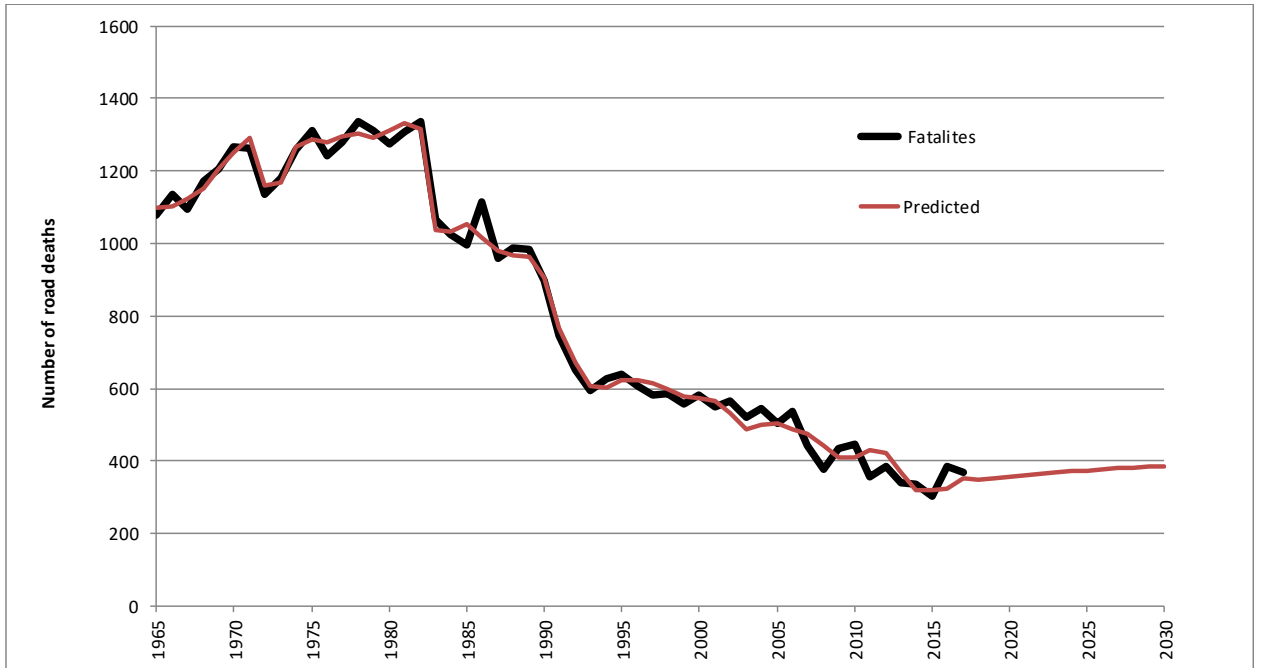
Source: BITRE estimates.

Victorian fatalities

For Victoria, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate and measures of random breath testing (RBT), speed cameras, mobile drug testing (MDT), per person mobile phone use, reductions in positive alcohol tests, the cumulative effects of recessions, as well as dummy variables (see Table A3). The results are shown in Table 4. Figure 10 shows the pattern of the fatality rate is accurately predicted by the model.

Figure 11 shows the components of the Victorian fatality prediction/forecast. The major influence is the increase in seat belt wearing. From the mid-1980s, RBT starts to have an effect, as does speed enforcement balanced by mobile phone use from the early 1990s. Mobile drug testing and reduced alcohol use take effect from the late 2000s. The 110kdum variable captures the effect on fatalities of the period when Victorian highway speed limits were raised from 100 km/hr to 110 km/hr in the late 1980s. Figure 12 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 10: Actual/predicted Victorian fatality rate

Source: BITRE estimates.

Figure 11: Components of the Victorian fatality rate prediction

Source: BITRE estimates.

Information sheet
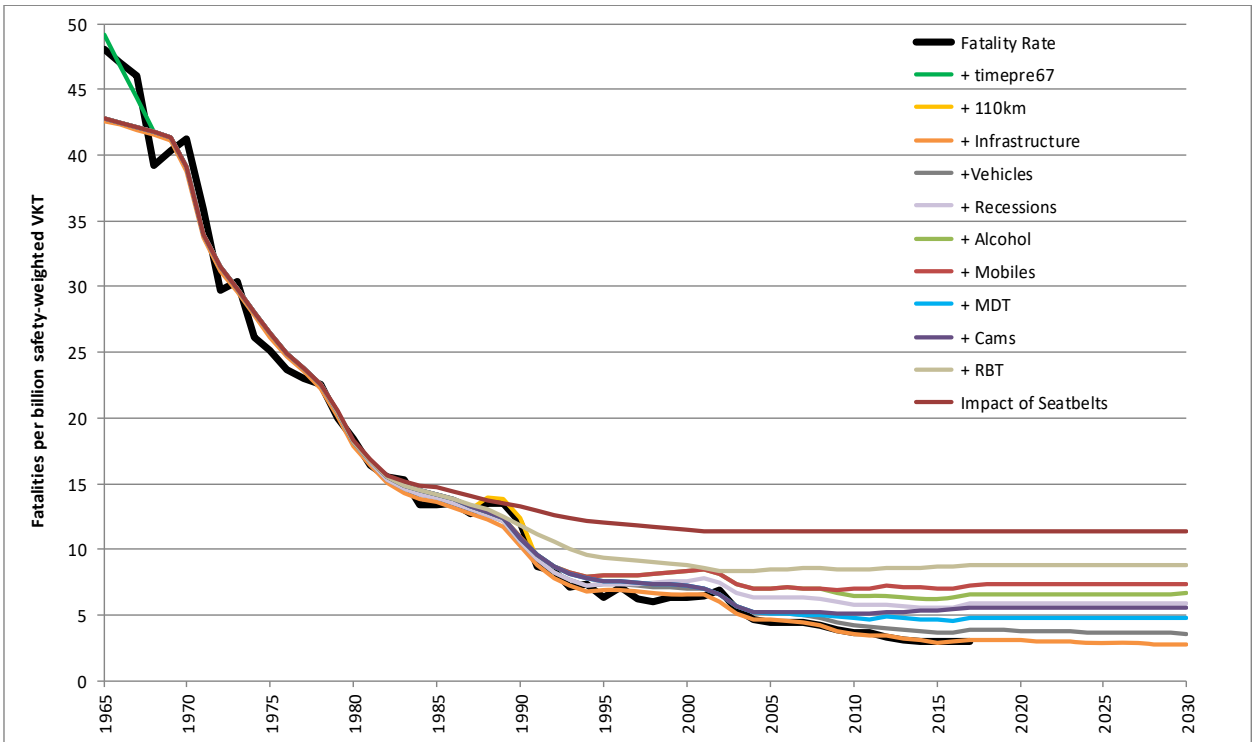
Figure 12: Actual/predicted Victorian road deaths

Source: BITRE estimates.

Queensland fatalities

For Queensland, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, random breath testing (RBT), speed camera enforcement, mobile drug testing (MDT), mobile phone use, the graduated licencing system (GLS), as well as dummy variables (see Table A4). The results are shown in Table 4. Figure 13 shows the pattern of the fatality rate is accurately predicted by the model.

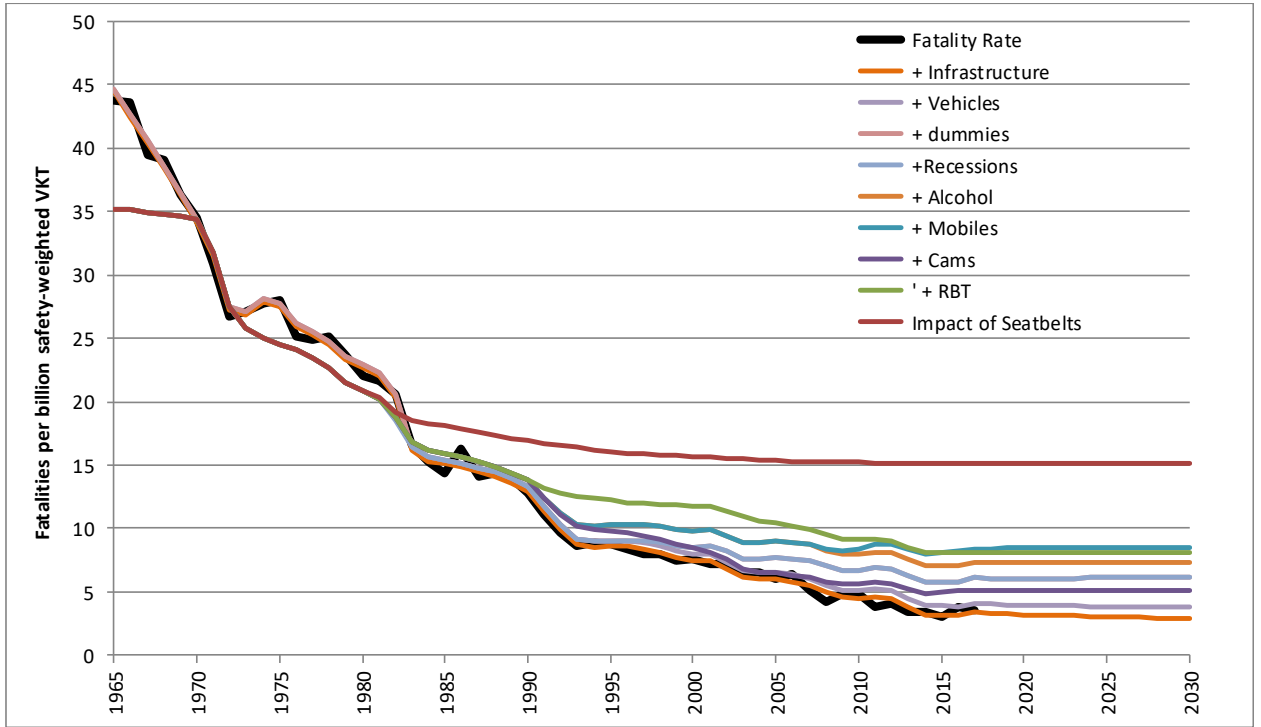## Figure 13: Actual/predicted Queensland fatality rate

Source: BITRE estimates.

Figure 14 shows the components of the Queensland fatality prediction/forecast. The major influence is the increase in seat belt wearing. From the late 1980s, RBT starts to have an effect, as does speed enforcement from the early 1990s. Figure 15 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 14: Components of the Queensland fatality rate prediction

Source: BITRE estimates.

Figure 15: Actual/predicted Queensland road deaths

Source: BITRE estimates.

South Australian fatalities

For South Australia, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, random breath testing (RBT), speed cameras and the cumulative effect of recessions (see Table A5). The results are shown in Table 4. Figure 16 shows the pattern of the fatality rate is accurately predicted by the model.

Figure 16: Actual/predicted South Australian fatality rate
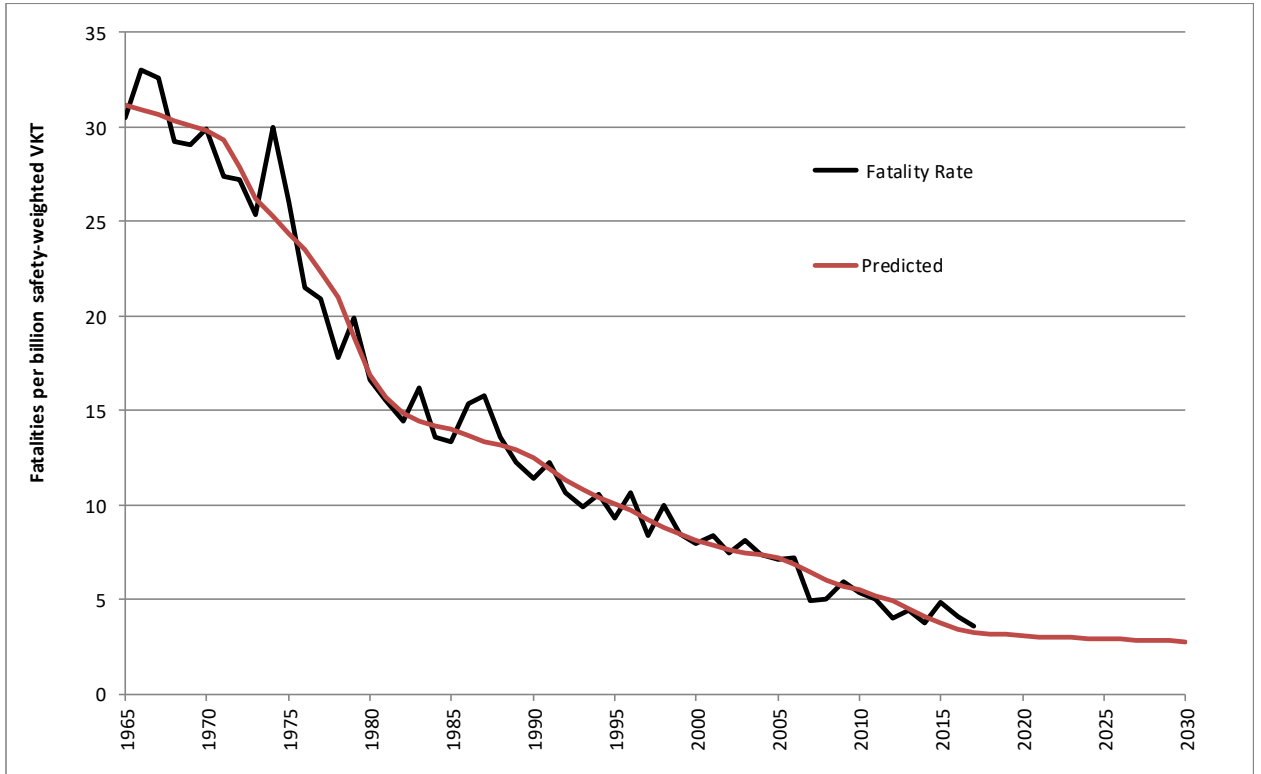
Source: BITRE estimates.

Figure 17 shows the components of the South Australian fatality prediction/forecast. The major influence is the increase in seat belt wearing. From the mid-1980s, RBT starts to have an effect, as does speed control from 1990. Figure 18 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 17 Components of the South Australian fatality rate prediction

Source: BITRE estimates.
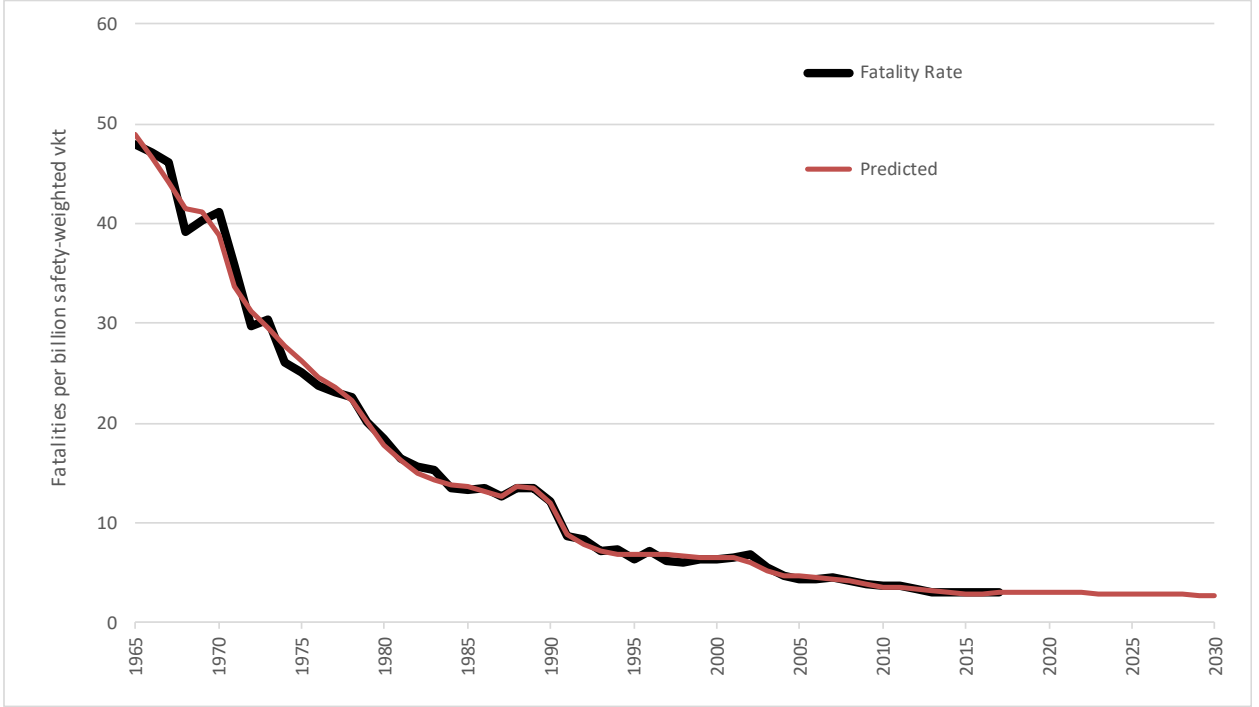
Figure 18: Actual/predicted South Australian road deaths
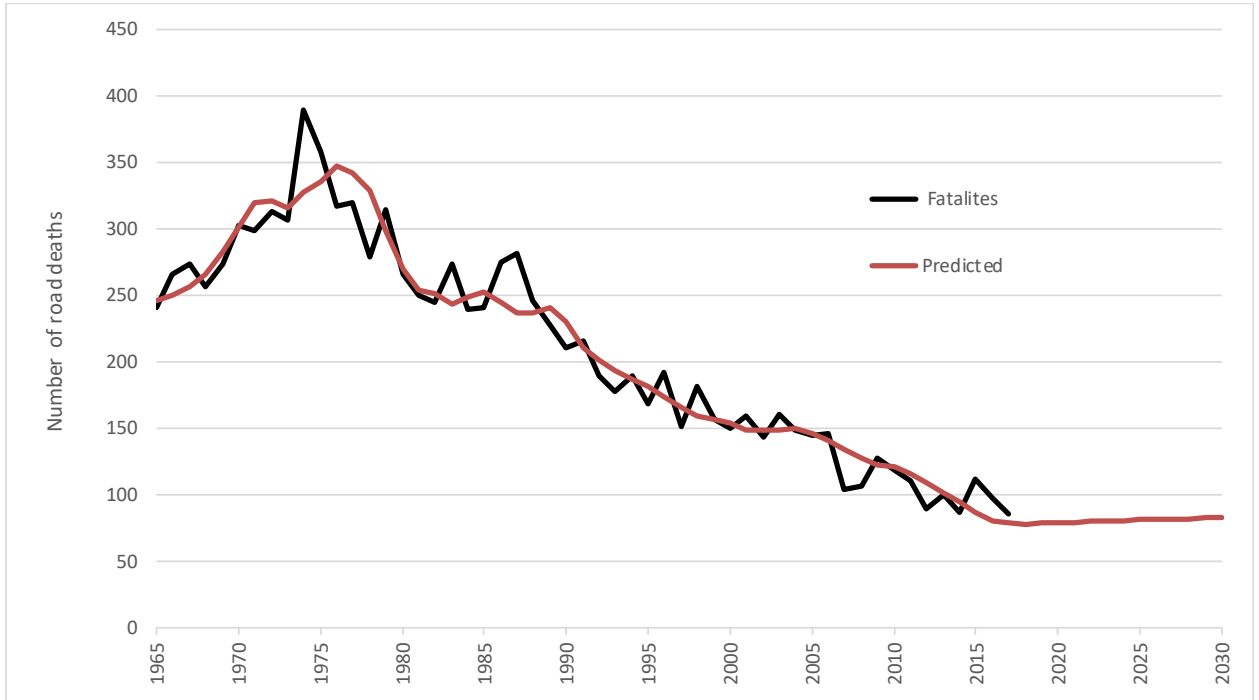
Source: BITRE estimates.

Western Australian fatalities

For Western Australia, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, random breath testing (RBT), speed cameras, mobile drug testing (MDT, as well as dummy variables (see Table A6). The results are shown in Table 4. Figure 19 shows the pattern of the fatality rate is accurately predicted by the model.

Figure 19: Actual/predicted Western Australian fatality rate
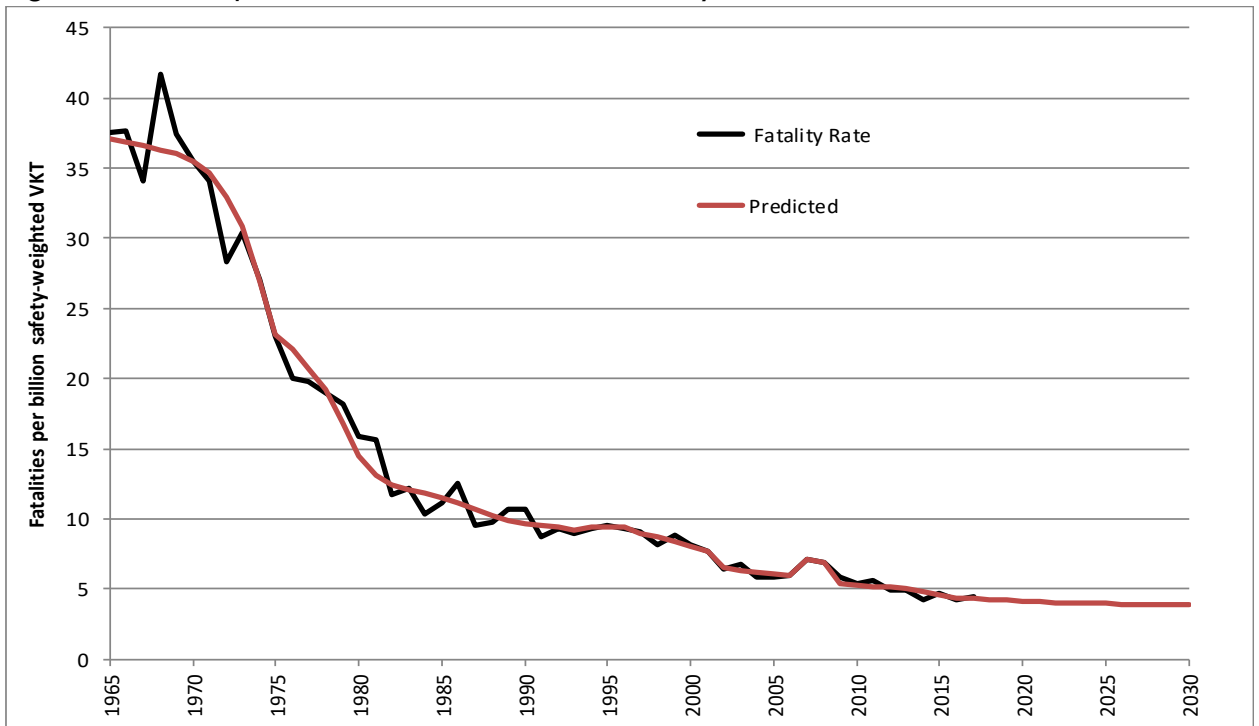
Source: BITRE estimates.

Figure 20 shows the components of the Western Australian fatality prediction/forecast. The major influence is the increase in seat belt wearing. From the mid-1980s, random breath testing and speed camera enforcement start to have an effect. From the late 2000s mobile drug testing lowers the fatality rate further. Figure 21 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 20: Components of the Western Australian fatality rate prediction
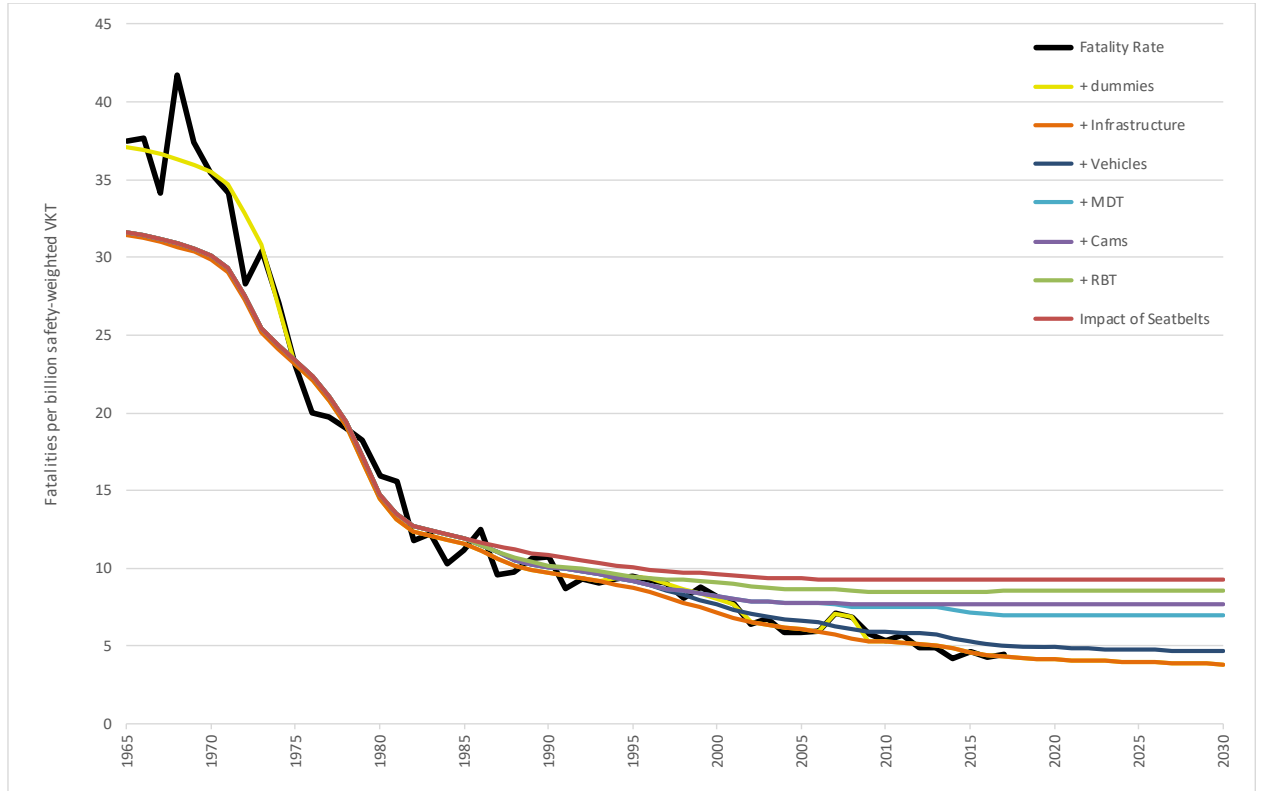
Source: BITRE estimates.

Figure 21: Actual/predicted Western Australian road deaths
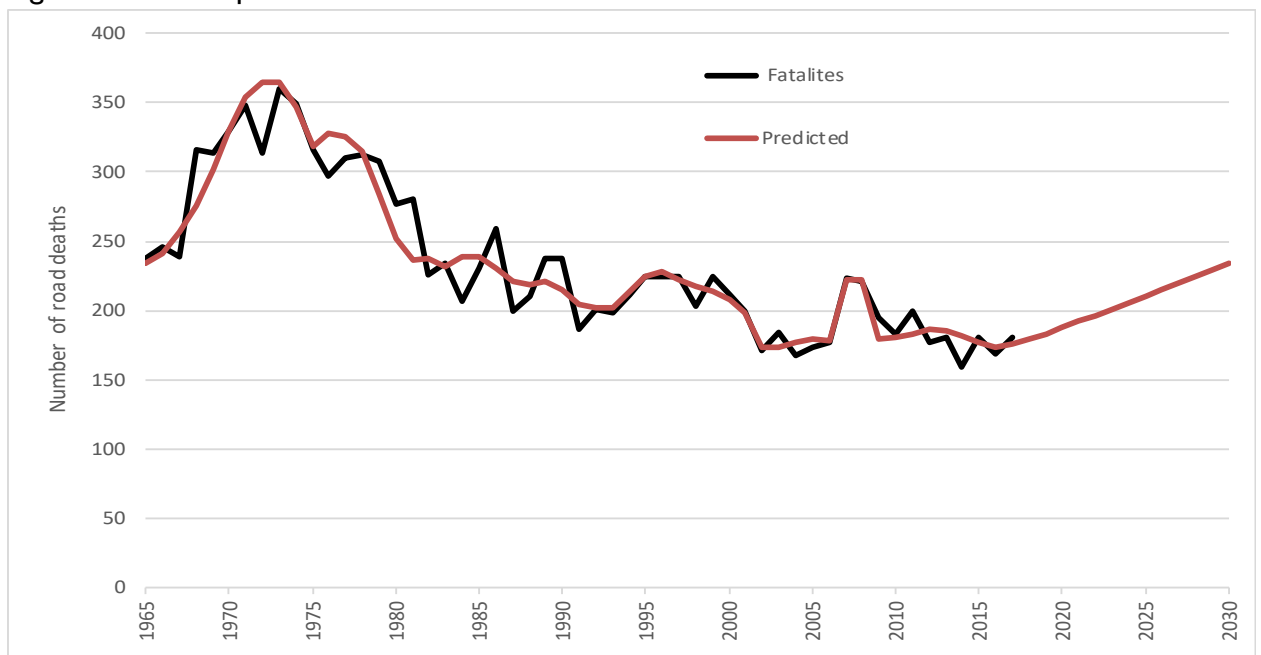
Source: BITRE estimates.

Tasmanian fatalities

For Tasmania, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, random breath testing (RBT), speed cameras and mobile drug testing (MDT) (see Table A7). The results are shown in Table 4. Figure 22 shows the pattern of the fatality rate is accurately predicted by the model.

Figure 23 shows the components of the Tasmanian fatality prediction/forecast. The major influence is the increase in seat belt wearing. From the early 1980s, random breath testing starts to have an effect, as does speed enforcement from the early 1990s, and mobile drug testing in the 2010s.

Figure 24 shows that the modelling also produces an accurate prediction of the level of fatalities over time.
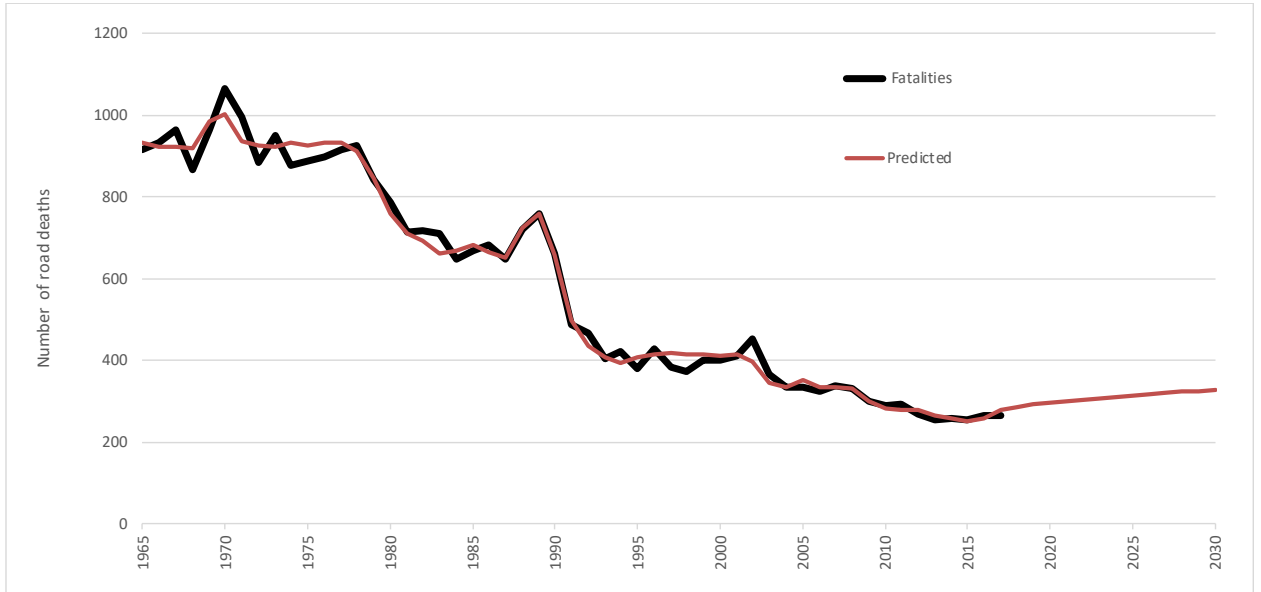
Figure 22: Actual/predicted Tasmanian fatality rate
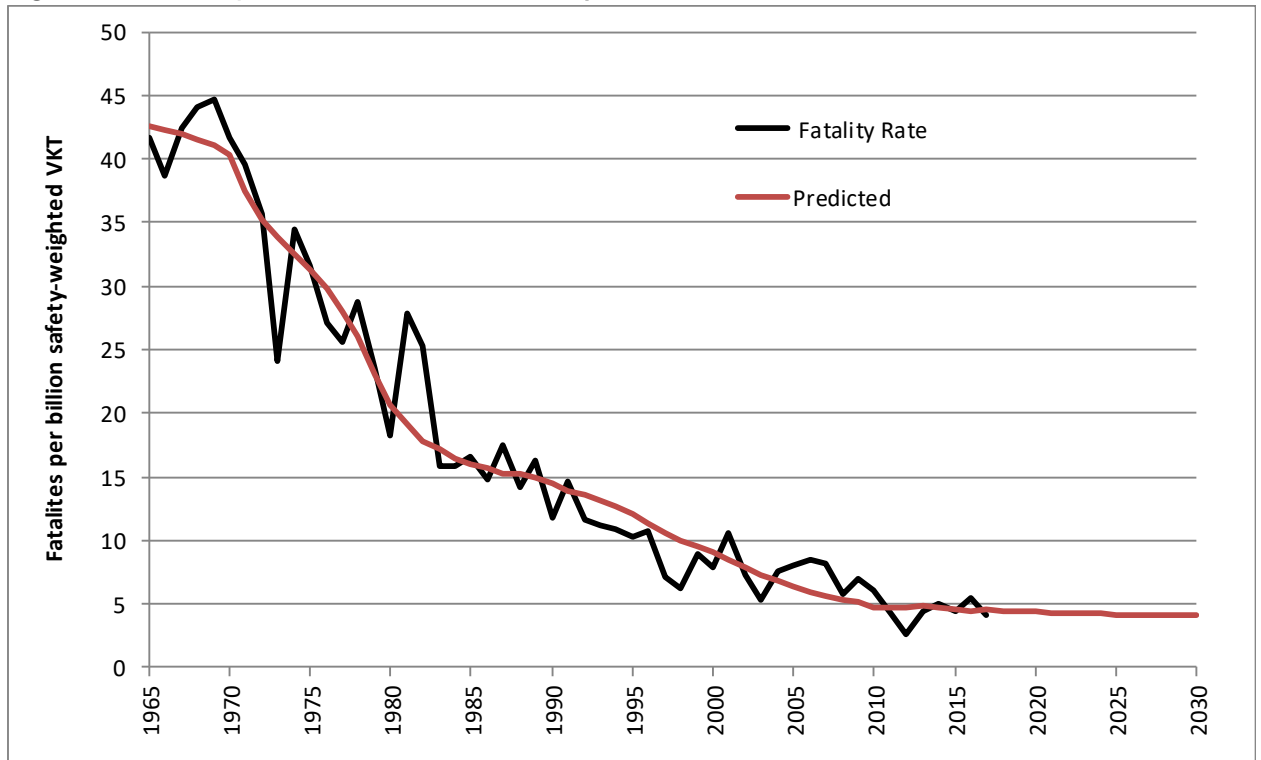
Source: BITRE estimates.

Figure 23: Components of the Tasmanian fatality rate prediction
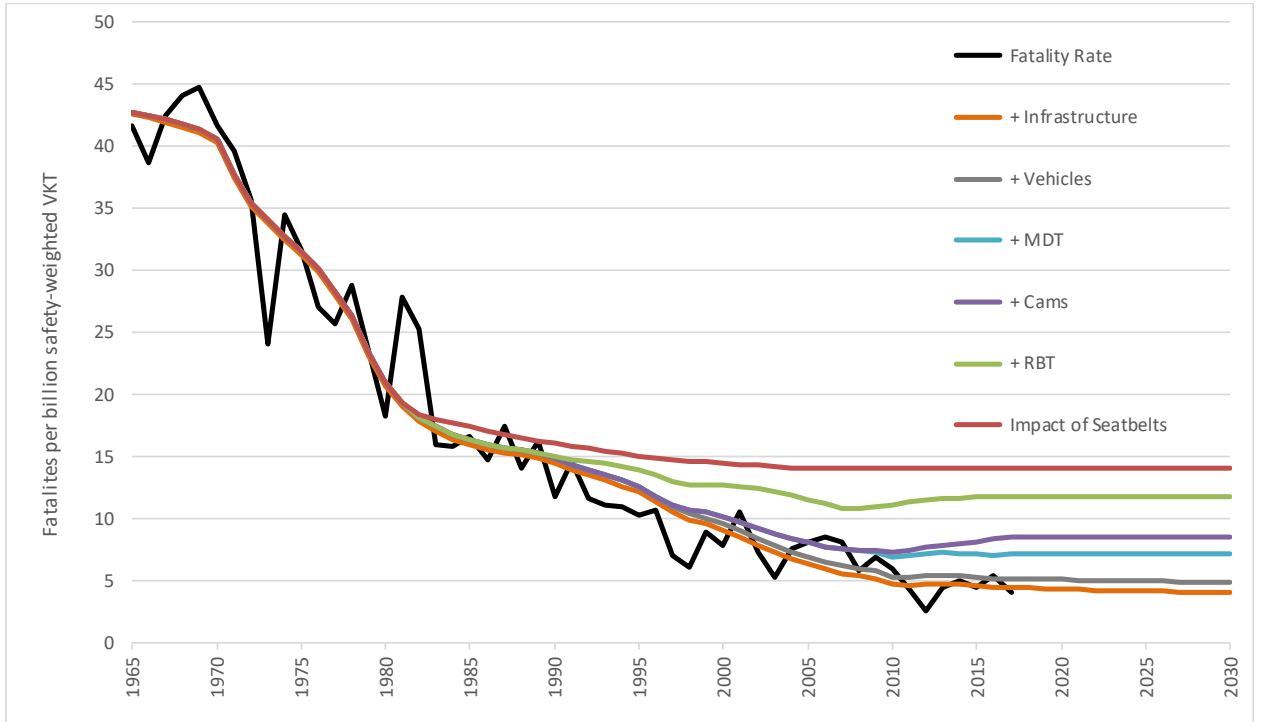
Source: BITRE estimates.
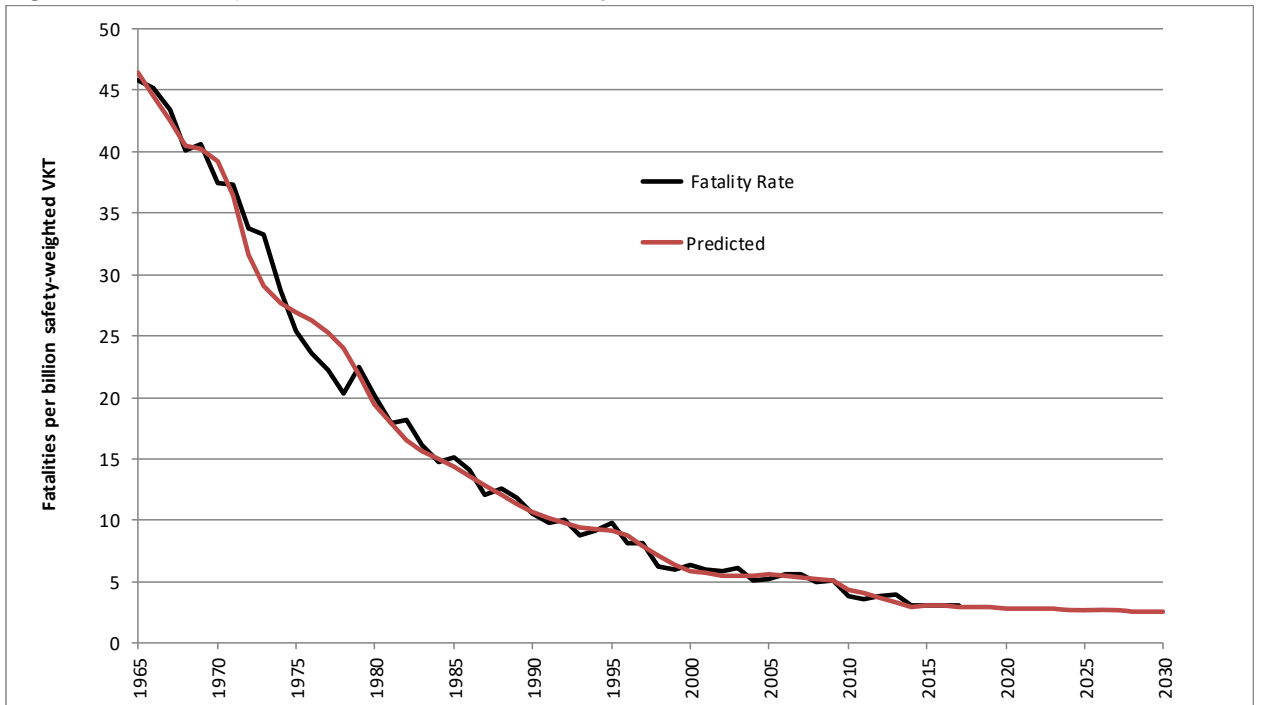
Figure 24: Actual/predicted Tasmanian road deaths
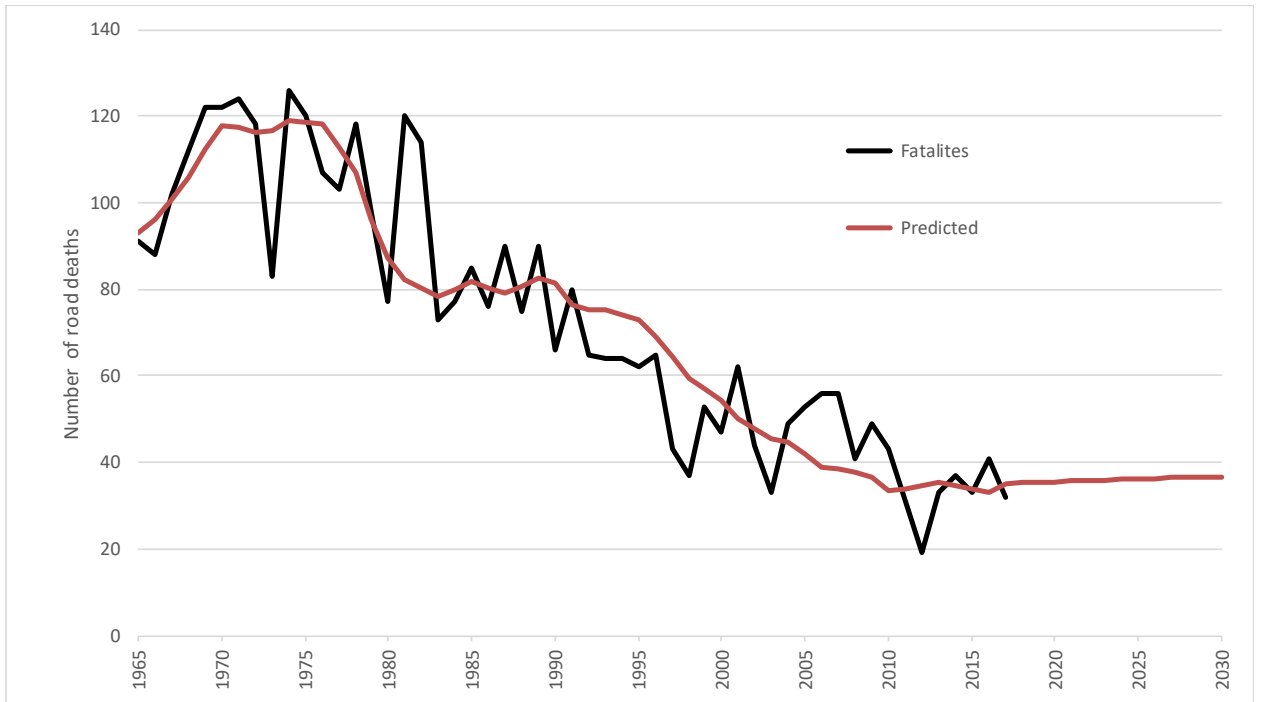
Source: BITRE estimates.

Northern Territory fatalities

For the Northern Territory, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, random breath testing (RBT), speed camera enforcement, reduced alcohol use, as well as dummy variables (see Table A8). The results are shown in Table 4. Figure 25 shows the pattern of the fatality rate is accurately predicted by the model.
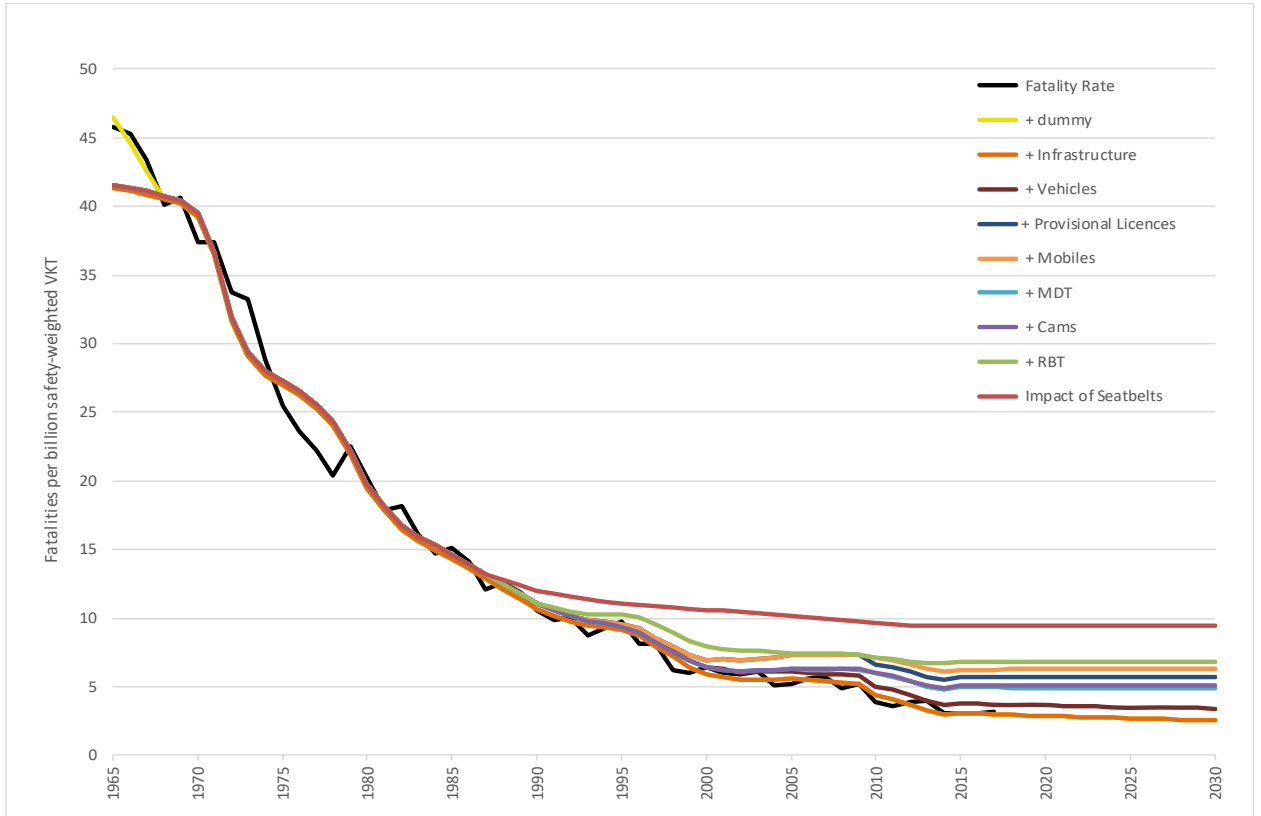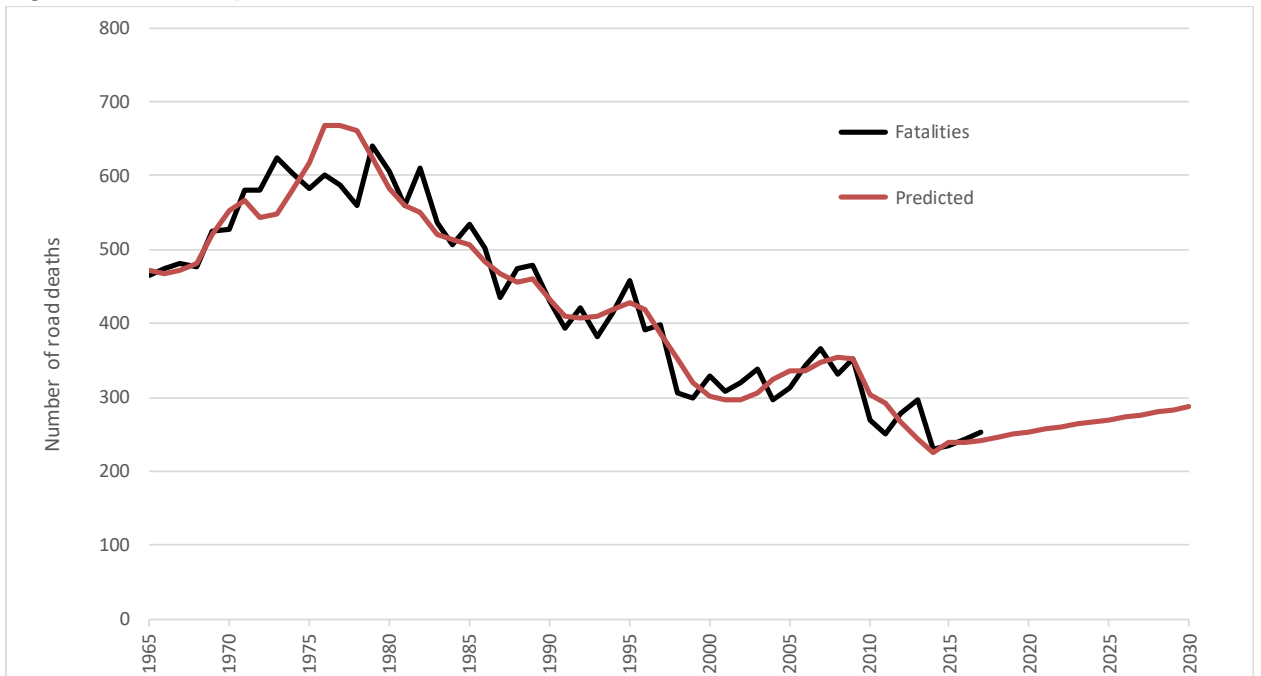
Figure 26 shows the components of the Northern Territory fatality prediction/forecast. The major influence is the increase in seat belt wearing. From early 1990s, random breath testing and speed enforcement start to have an effect. The effect of reduced alcohol use starts in the 2010s. Figure 27 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 25: Actual/predicted Northern Territory fatality rate
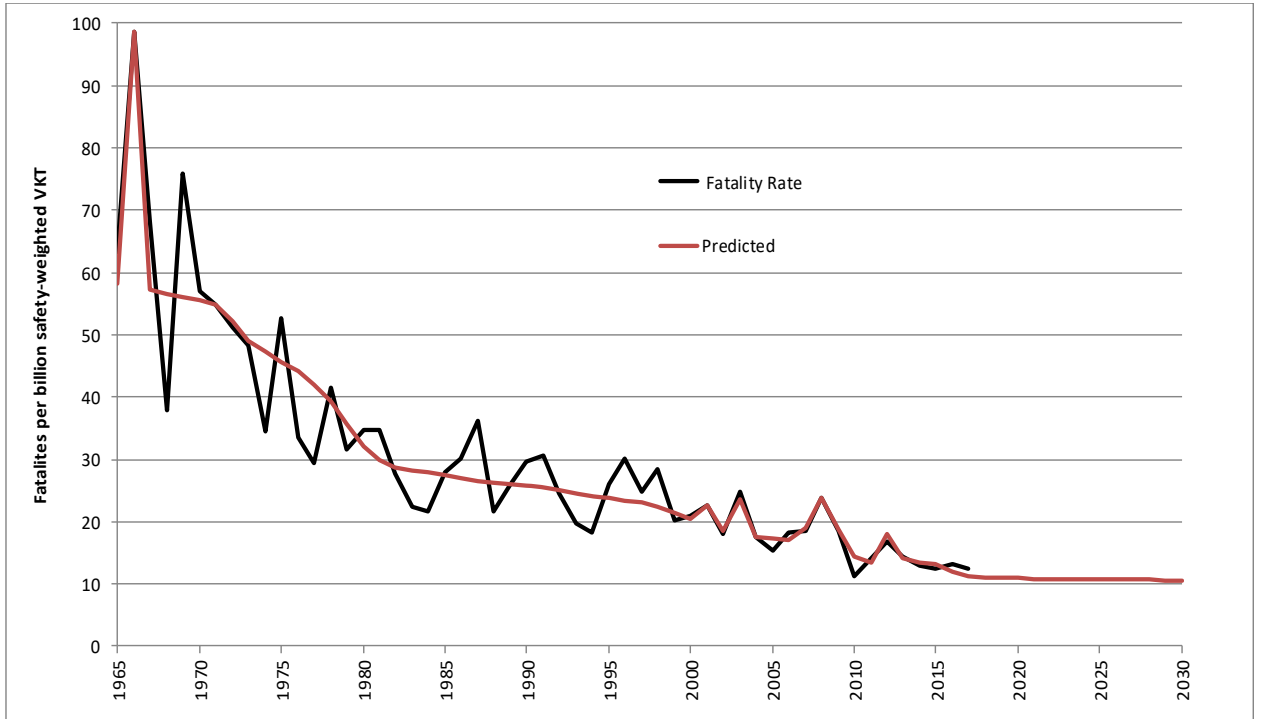
Source: BITRE estimates.

Figure 26 Components of the Northern Territory fatality rate prediction
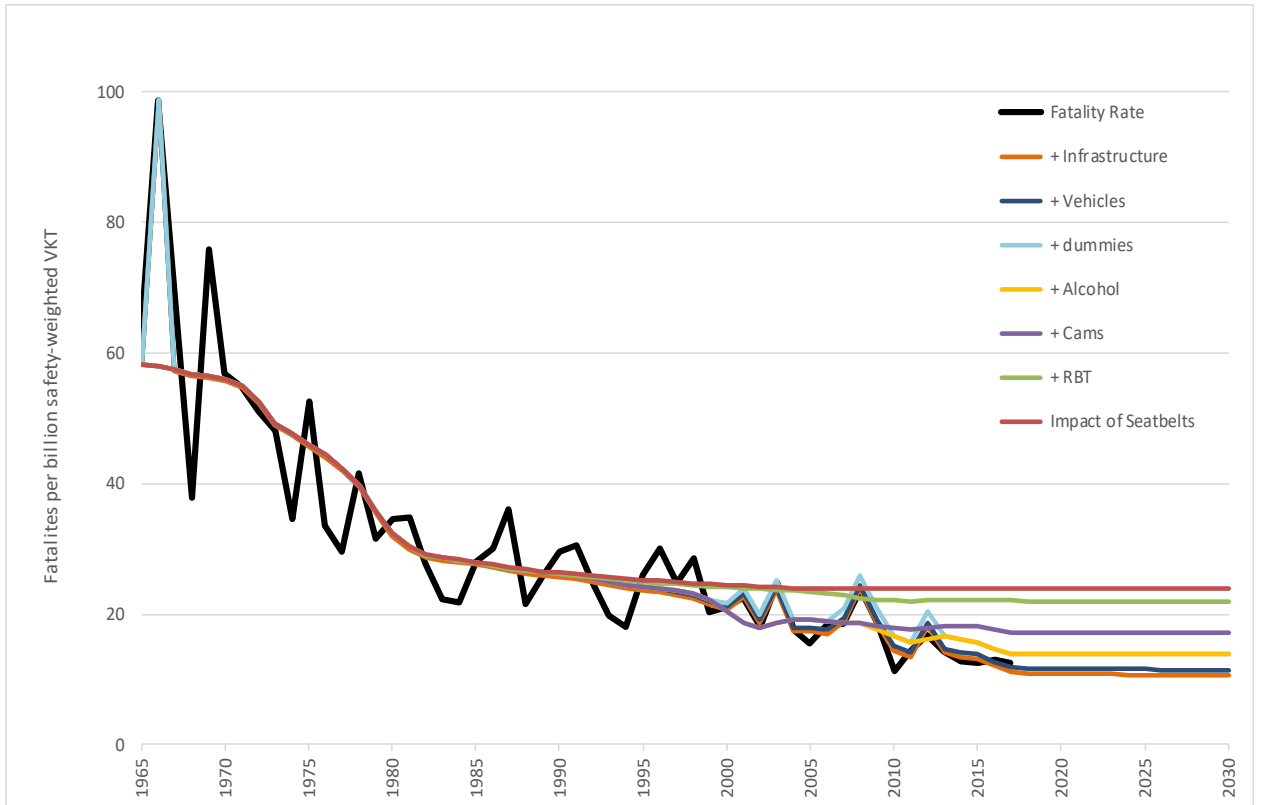
Source: BITRE estimates.

Figure 27: Actual/predicted Northern Territory road deaths
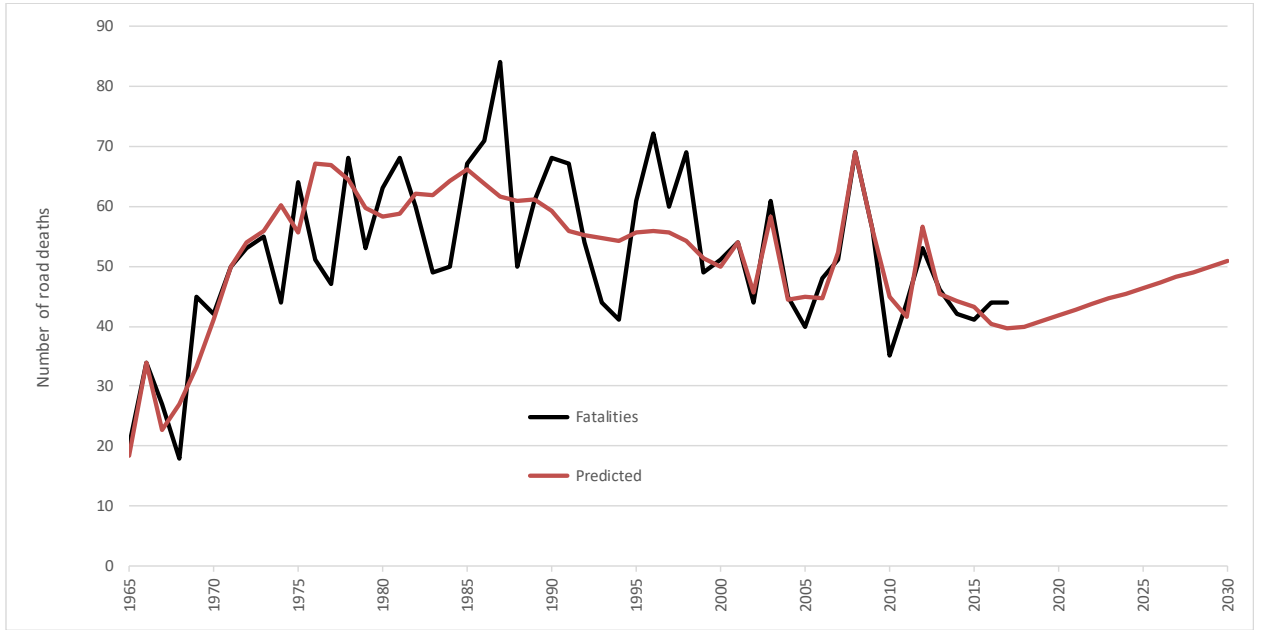
Source: BITRE estimates.

Australian Capital Territory fatalities

For the ACT, a model of the fatality rate was constructed using the all-occupant seat belt wearing rate, random breath testing (RBT), speed cameras, mobile drug testing (MDT) and dummy variables (see Table A9). The results are shown in Table 4. Figure 28 shows the pattern of the fatality rate accurately predicted by the model.

Figure 28: Actual/predicted ACT fatality rate
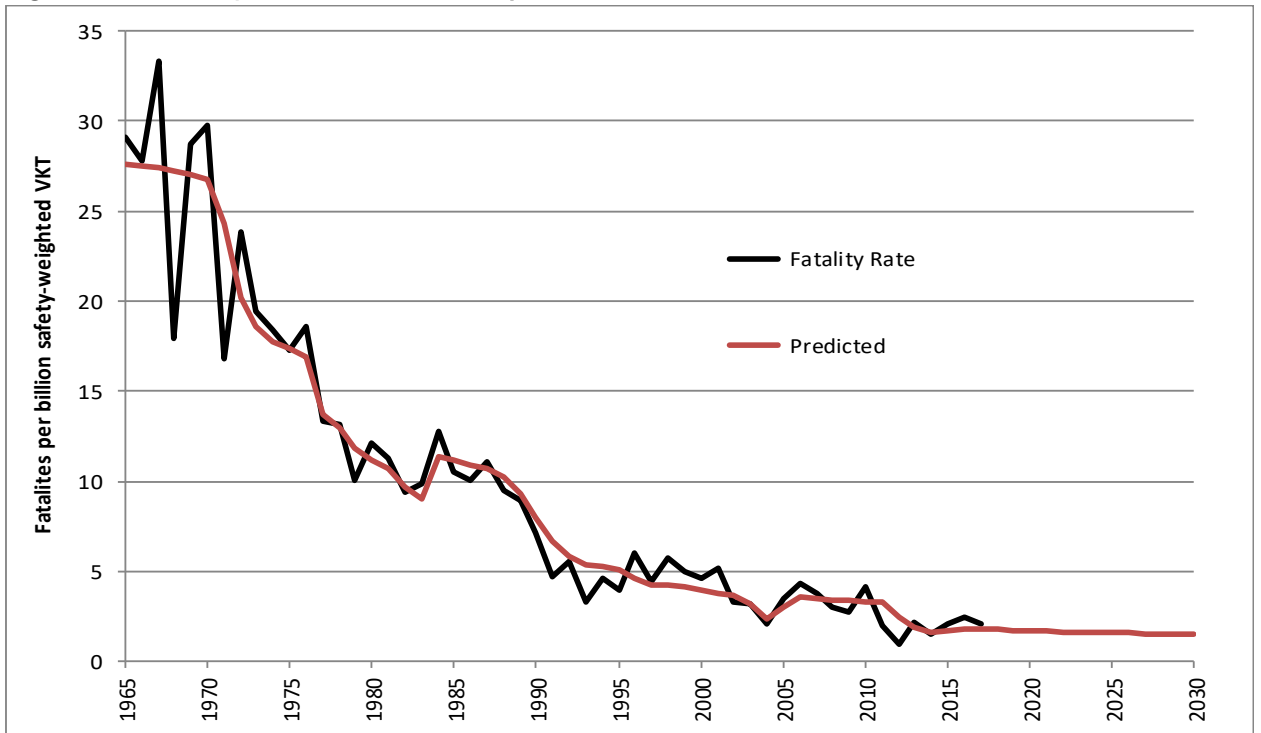
Source: BITRE estimates.

Figure 29 shows the components of the ACT fatality prediction/forecast. The major influence is the increase in seat belt wearing. From 1990, random breath testing starts to have an effect, as does speed enforcement in

the 2000s and mobile drug testing in the 2010s. Figure 30 shows that the modelling also produces an accurate prediction of the level of fatalities over time.

Figure 29 Components of the ACT fatality rate prediction
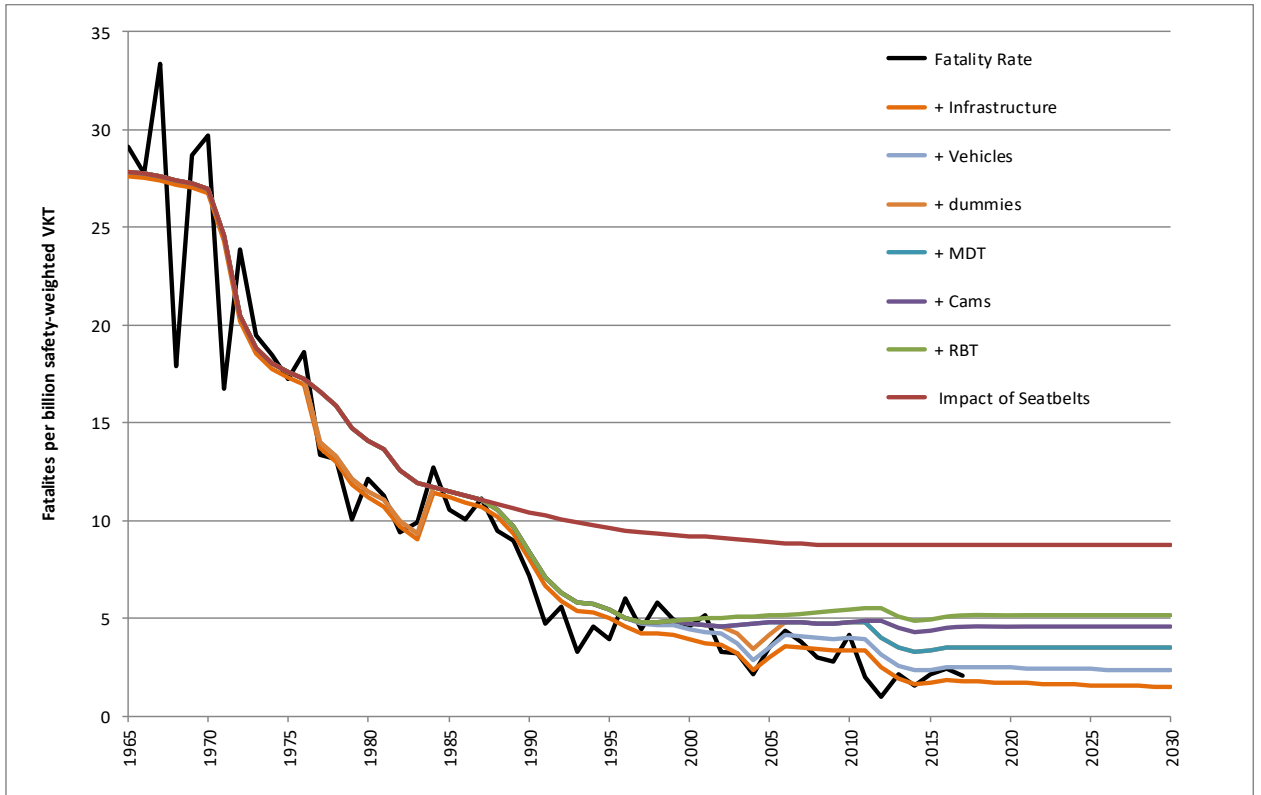
Source: BITRE estimates.
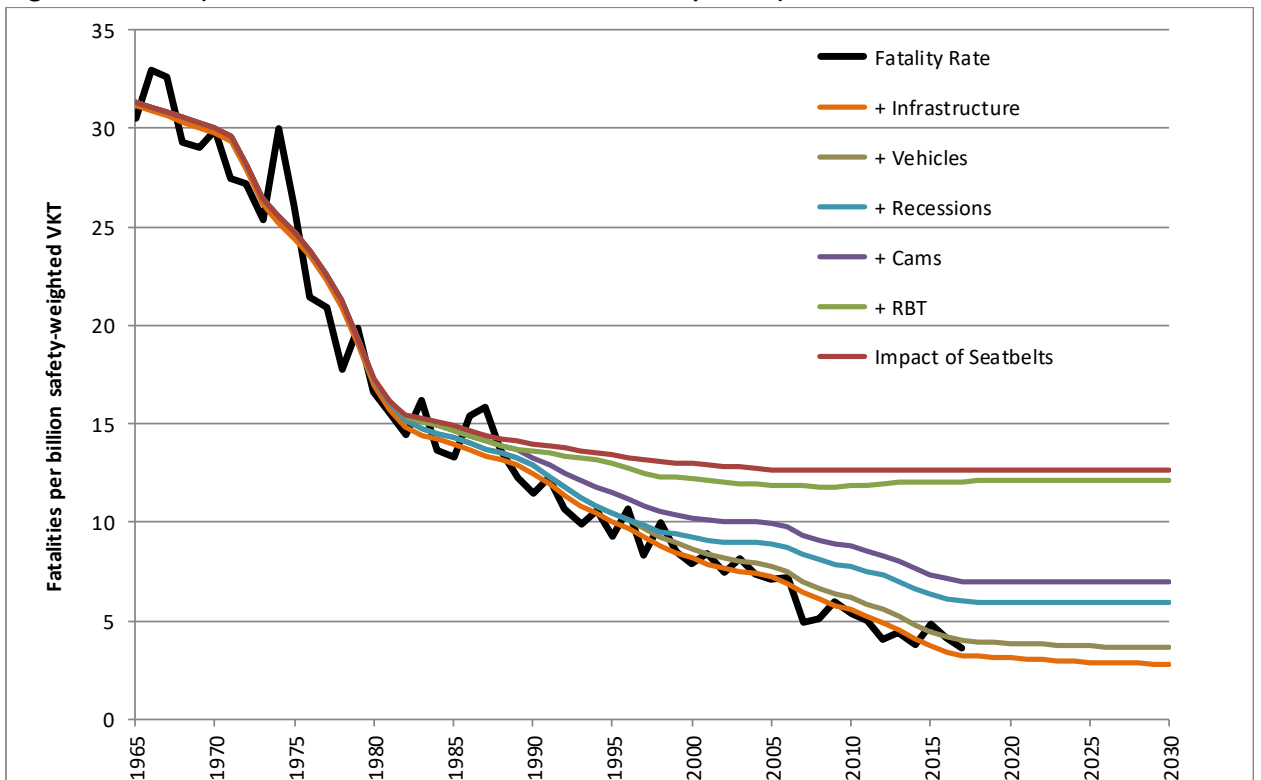
Figure 30 Actual/predicted ACT road deaths
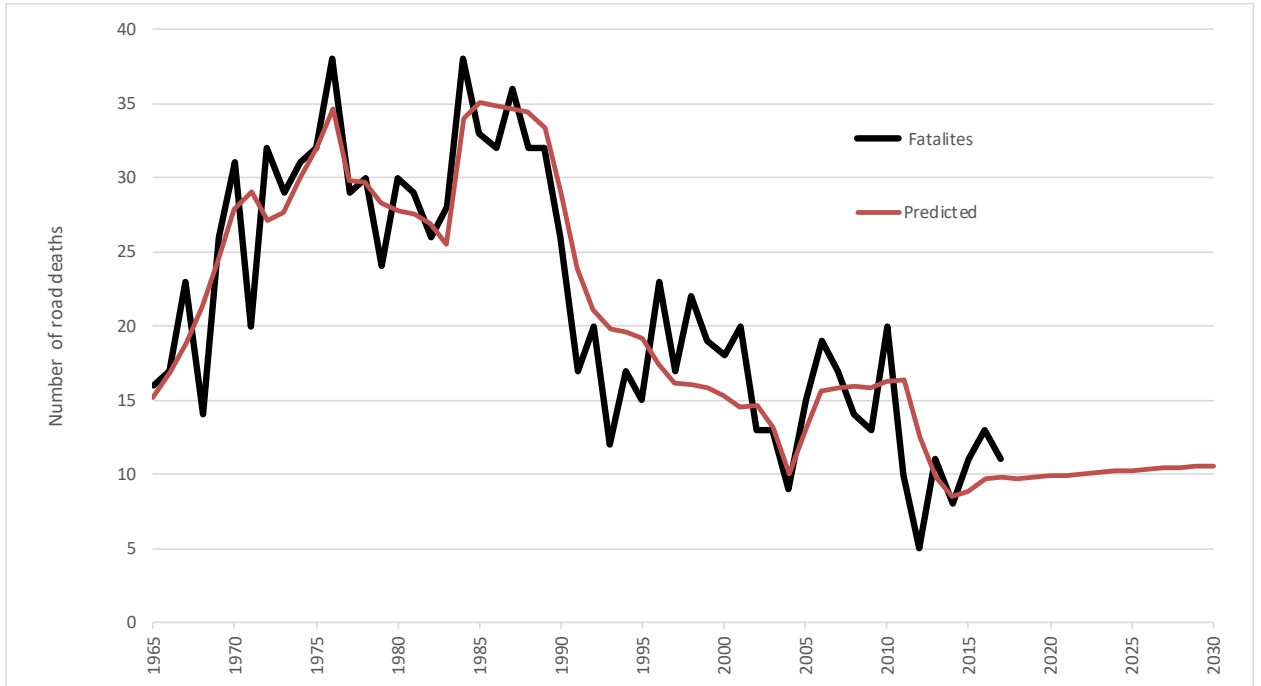
Source: BITRE estimates.

State/territory comparisons

The State/territory model results are compared to the Australian model results in Table 5. The total of the State models will never exactly equal that of the Australian model, as all the models are completely independent. However, it can be seen that the models roughly agree that, over the period to 2030, the increase in fatalities from VKT growth will outstrip the decrease in fatalities from measures, leading to a substantial increase in fatalities (as opposed to the decreases in the periods 2000–2010 and 2010–2017). This is especially so for jurisdictions such as Western Australia and the Northern Territory, where traffic growth is expected to be greater than in the rest of Australia.

Table 5: Comparisons of fatality changes predicted by jurisdiction-specific versus Australian models

Jurisdiction	Predicted fatalities 2018	Measures impact 2018–2030	VKT growth 2018–2030	Predicted change 2018–2030	Predicted fatalities 2030	Change in fatalities 2018–2030
	(*Number*)	(*Change in number fatalities*)			(*Number*)	(*per cent*)
NSW	349	-48	85	37	386	11
Victoria	286	-43	86	42	329	15
Queensland	246	-43	84	41	287	17
South Australia	78	-12	16	5	83	6
Western Australia	179	-25	79	55	234	31
Tasmania	35	-3.7	5.1	1.4	37	4
Northern Territory	40	-1.9	12.9	11.0	51	28
ACT	10	-1.8	2.7	0.9	11	9
Total – State models	1223	-178	371	193	1416	17
Australian model	1153	-181	346	166	1319	14

Source: BITRE estimates.

Conclusions

Looking back over the previous 50-plus years, this Information Sheet has presented models of road fatality rates for the eight Australian states and territories, and fatality and injury rates for Australia as a whole. The models constructed allow an understanding of the forces underlying the fatality rates in jurisdiction covered, and also allow forecasts of future trends in road safety – or rather its obverse, death and injury.

The major influences lowering the road toll have been seat belt fitting and wearing, random breath testing, speed cameras, mobile drug testing and, in Queensland, a graduated licencing system. Other influences are rising deaths as a result of mobile phone use, balanced by the spread of vehicle safety technology and infrastructure improvements and by downward social trends in 'drinking and driving'. However, both fatality and injury rates are forecast to be only very slowly declining to 2030, in the absence of further policy measures. Given expected increases in vehicle kilometres travelled, this results in forecast increases in annual deaths (plus 14 per cent) and hospitalised injuries (plus 25 per cent) from 2018 to 2030.

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Appendix A

Table A1: Australian and common state/territory model data

Fin. Yr	Mobile phones	Population	Mobiles per person	Reduction in fatality rate from vehicle safety	Vehicle safety	Reduction in fatality rate from vehicles	Infrastructure lives saved	Safety-weighted VKT	Reduction in fatality rate from infrastructure	Cumulative recession dummy
	(million)	('000)	(no.)	(per cent)	(Log)	(per cent)	(number)	(billion)	(per cent)	
1965	0	11609	0.00	0.0	0	0	12.9	71.17	0.18	0
1966	0	11834	0.00	0.0	0	0	15.1	74.15	0.20	0
1967	0	12050	0.00	0.0	0	0	17.4	78.61	0.22	0
1968	0	12281	0.00	0.0	0	0	19.9	84.19	0.24	0
1969	0	12554	0.00	0.0	0	0	22.5	92.09	0.24	0
1970	0	12810	0.00	0.0	0	0	25.1	100.74	0.25	0
1971	0	13068	0.00	0.0	0	0	27.8	110.65	0.25	0
1972	0	13304	0.00	0.0	0	0	30.5	117.71	0.26	0
1973	0	13505	0.00	0.0	0	0	33.5	123.57	0.27	0
1974	0	13723	0.00	0.0	0	0	36.3	132.37	0.27	0
1975	0	13893	0.00	0.0	0	0	39.2	139.47	0.28	0
1976	0	14033	0.00	0.0	0	0	42.2	149.75	0.28	0
1977	0	14193	0.00	0.0	0	0	45.2	156.35	0.29	0
1978	0	14360	0.00	0.0	0	0	48.4	161.83	0.30	0
1979	0	14516	0.00	0.0	0	0	51.5	166.81	0.31	0
1980	0	14696	0.00	0.0	0	0	54.3	172.30	0.31	0
1981	0	14923	0.00	0.0	0	0	57.0	178.16	0.32	0.4
1982	0	15184	0.00	0.0	0	0	59.6	190.02	0.31	1.4
1983	0	15393	0.00	0.0	0	0	62.3	189.67	0.33	2.1
1984	0	15579	0.00	0.0	0	0	65.3	197.67	0.33	2.3
1985	0	15788	0.00	0.0	0	0	68.5	204.45	0.33	2.3
1986	0	16018	0.00	0.0	0	0	71.6	203.91	0.35	2.3
1987	0	16264	0.00	0.0	0	0	74.7	204.62	0.36	2.3
1988	0	16532	0.00	0.0	0	0	77.5	210.63	0.37	2.3
1989	0	16814	0.00	0.0	0	0	80.5	219.78	0.37	2.3
1990	0.1	17065	0.01	0.0	0	0	84.0	217.40	0.39	2.3
1991	0.2	17284	0.01	0.0	0	0	87.3	213.94	0.41	3.3
1992	0.3	17478	0.02	0.0	0	0	90.5	215.55	0.42	4.3
1993	0.6	17635	0.03	0.0	0	0	94.2	220.95	0.43	5.3
1994	0.9	17803	0.05	0.2	0	0	98.3	225.45	0.44	5.8
1995	2.2	18002	0.12	0.5	0	0	102.1	232.25	0.44	6.3
1996	2.9	18222	0.16	0.9	0	0	106.0	235.32	0.45	6.3
1997	3.7	18421	0.20	1.2	0.22	0.1	110.1	238.22	0.46	6.3
1998	4.5	18605	0.24	1.6	0.49	0.3	114.9	240.25	0.48	6.3
1999	5.3	18810	0.28	2.1	0.73	0.4	120.4	243.74	0.49	6.3
2000	6.4	19027	0.34	2.6	0.94	0.6	125.5	247.24	0.51	6.3
2001	8.5	19272	0.44	3.3	1.18	0.7	129.9	248.20	0.52	6.3
2002	9.3	19493	0.48	4.1	1.42	0.8	134.1	256.15	0.52	6.3
2003	10.2	19719	0.51	5.1	1.62	1.0	139.0	261.45	0.53	6.3
2004	11.6	19931	0.58	6.1	1.81	1.1	144.7	274.24	0.53	6.3
2005	12.5	20175	0.62	7.3	1.99	1.2	151.4	282.62	0.54	6.3
2006	13.1	20449	0.64	8.5	2.14	1.3	158.7	282.37	0.56	6.3
2007	13.4	20825	0.64	9.9	2.29	1.4	166.2	292.50	0.57	6.3
2008	13.6	21247	0.64	11.4	2.44	1.4	173.9	301.77	0.58	6.3
2009	14.0	21689	0.65	13.1	2.57	1.5	183.3	298.39	0.61	6.3
2010	15.2	22029	0.69	15.0	2.71	1.6	191.9	303.35	0.63	6.3
2011	16.6	22337	0.74	16.7	2.82	1.7	201.2	317.06	0.63	6.3
2012	17.5	22726	0.77	18.5	2.92	1.7	211.1	323.47	0.65	6.3
2013	17.5	23123	0.76	20.5	3.02	1.8	220.4	329.66	0.67	6.3
2014	18.2	23488	0.77	22.7	3.12	1.9	228.1	334.85	0.68	6.3
2015	18.6	23866	0.78	24.7	3.21	1.9	236.1	340.53	0.69	6.3
2016	19.0	24270	0.78	26.9	3.29	2.0	247.3	347.32	0.71	6.3
2017	19.8	24674	0.80	28.9	3.36	2.0	259.5	356.29	0.73	6.3
2018	20.4	25077	0.81	30.9	3.43	2.0	270.8	365.53	0.74	6.3
2019	20.8	25481	0.82	32.9	3.49	2.1	281.9	375.08	0.75	6.3
2020	21.2	25885	0.82	34.8	3.55	2.1	292.7	384.74	0.76	6.3
2021	21.6	26288	0.82	36.8	3.61	2.1	303.5	394.38	0.77	6.3
2022	21.9	26692	0.82	38.7	3.66	2.2	314.5	404.08	0.78	6.3
2023	22.2	27096	0.82	40.4	3.70	2.2	325.5	413.63	0.79	6.3
2024	22.6	27499	0.82	42.2	3.74	2.2	336.3	423.07	0.79	6.3
2025	22.9	27903	0.82	44.0	3.78	2.2	347.1	432.41	0.80	6.3
2026	23.2	28307	0.82	45.4	3.82	2.3	358.1	441.47	0.81	6.3
2027	23.6	28710	0.82	46.9	3.85	2.3	369.3	450.19	0.82	6.3
2028	23.9	29114	0.82	48.3	3.88	2.3	380.5	458.67	0.83	6.3
2029	24.2	29517	0.82	49.6	3.90	2.3	391.6	467.01	0.84	6.3
2030	24.6	29921	0.82	50.7	3.93	2.3	402.6	475.26	0.85	6.3

Source: BITRE estimates.

Table A1: Australian and common state/territory model data (continued)

Fin. Yr	Fatalities	Injuries	Seat belt wearing	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests	Dummy 1965–1967	Time trend 1997–2015
	(number)	(number)	(per cent)	(number)	(number)	(number)	(per cent)		
1965	3 065	34000	2.3	0	0	0		1	0
1966	3 193	34681	3.0	0	0	0		1	0
1967	3 204	35838	3.9	0	0	0		0.5	0
1968	3 235	36583	4.9	0	0	0		0	0
1969	3 475	37873	6.0	0	0	0		0	0
1970	3 685	41128	9.1	0	0	0		0	0
1971	3 681	40081	19.6	0	0	0		0	0
1972	3 430	40798	33.0	0	0	0		0	0
1973	3 588	41434	40.1	0	0	0		0	0
1974	3 676	42291	44.6	0	0	0		0	0
1975	3 671	39629	47.9	0	0	0		0	0
1976	3 550	39875	51.1	1 282	0	0		0	0
1977	3 591	39358	54.9	5 126	0	0		0	0
1978	3 629	41692	59.3	9 569	0	0		0	0
1979	3 591	41294	66.2	23 239	0	0		0	0
1980	3 379	39217	72.5	20 505	0	0		0	0
1981	3 329	38106	76.4	29 850	0	0		0	0.4
1982	3 333	37838	80.6	100 438	0	0		0	1.4
1983	2 970	33675	82.9	336 041	0	0		0	2.1
1984	2 788	35069	84.1	444 127	0	0		0	2.3
1985	2 856	32781	85.1	457 887	0	0		0	2.3
1986	3 013	34544	86.4	531 885	1 280	0		0	2.3
1987	2 734	34568	87.7	563 424	4 699	0		0	2.3
1988	2 797	34918	88.7	592 076	8 148	0		0	2.3
1989	2 870	33686	89.7	883 611	6 224	0		0	2.3
1990	2 598	31114	90.6	1 075 160	53 180	0		0	2.3
1991	2 195	28006	91.4	1 223 443	236 083	0		0	3.3
1992	2 066	25384	92.2	1 337 195	255 449	0		0	4.3
1993	1 878	24836	93.0	1 433 269	260 498	0		0	5.3
1994	1 988	25555	93.7	1 467 918	276 045	0		0	5.8
1995	2 004	25430	94.1	1 466 403	248 568	0		0	6.3
1996	2 002	25938	94.5	1 591 020	329 602	0		0	6.3
1997	1 860	24489	95.0	1 808 345	340 912	0		0	6.3
1998	1 775	25489	95.3	1 810 927	353 527	0		0	6.3
1999	1 763	25459	95.6	1 878 935	385 635	0		0	6.3
2000	1 788	26698	95.9	2 040 719	418 663	0		0	6.3
2001	1 761	26694	96.1	2 243 840	422 930	0		0	6.3
2002	1 751	28440	96.4	2 384 259	476 445	0		0	6.3
2003	1 677	27526	96.6	2 602 685	597 288	0		0	6.3
2004	1 595	28782	96.8	2 639 566	623 841	1 788		0	6.3
2005	1 577	29850	97.0	2 777 977	594 752	4 865		0	6.3
2006	1 647	31204	97.2	2 807 147	601 030	7 943		0	6.3
2007	1 596	32777	97.4	2 899 444	612 099	11 140		0	6.3
2008	1 489	32543	97.5	3 008 827	607 391	14 404	0.84	0	6.3
2009	1 526	34116	97.5	3 165 939	587 536	16 945	0.84	0	6.3
2010	1 401	32981	97.6	3 285 929	555 409	24 556	0.76	0	6.3
2011	1 295	33240	97.7	3 178 972	581 081	25 699	0.68	0	6.3
2012	1 276	34550	97.8	3 339 597	610 788	25 427	0.60	0	6.3
2013	1 263	34011	97.8	3 386 182	594 499	26 487	0.56	0	6.3
2014	1 155	35646	97.8	3 724 686	743 032	29 798	0.48	0	6.3
2015	1 171	36283	97.8	3 479 191	763 254	53 150	0.46	0	6.3
2016	1 260		97.8	3 122 487	686 840	59 737	0.42	0	6.3
2017	1 220		97.8	2 939 448	676 964	73 874	0.43	0	6.3
2018			97.8	3 316 453	708 361	75 717	0.43	0	6.3
2019			97.8	3 403 114	726 572	77 591	0.43	0	6.3
2020			97.8	3 490 725	744 943	79 483	0.43	0	6.3
2021			97.8	3 578 251	763 264	81 371	0.43	0	6.3
2022			97.8	3 666 230	781 624	83 262	0.43	0	6.3
2023			97.8	3 752 925	799 624	85 116	0.43	0	6.3
2024			97.8	3 838 567	817 258	86 937	0.43	0	6.3
2025			97.8	3 923 261	834 549	88 732	0.43	0	6.3
2026			97.8	4 005 434	851 255	90 468	0.43	0	6.3
2027			97.8	4 084 568	867 257	92 115	0.43	0	6.3
2028			97.8	4 161 556	882 866	93 708	0.43	0	6.3
2029			97.8	4 237 231	898 224	95 257	0.43	0	6.3
2030			97.8	4 312 050	913 408	96 780	0.43	0	6.3

Source: BITRE estimates.

Table A2: New South Wales model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests	Time trend Pre-1969	Dummy variable 1973–1982
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)		
1965	1 080	1.7	24.68	0	0	0		5	0
1966	1 134	2.1	25.99	0	0	0		4	0
1967	1 096	2.8	27.77	0	0	0		3	0
1968	1 174	3.6	30.04	0	0	0		2	0
1969	1 206	4.4	33.21	0	0	0		1	0
1970	1 267	5.8	36.74	0	0	0		0	0
1971	1 264	18.0	40.97	0	0	0		0	0
1972	1 137	38.7	42.55	0	0	0		0	0
1973	1 181	47.0	43.56	0	0	0		0	0.6
1974	1 257	51.0	45.38	0	0	0		0	1.5
1975	1 311	53.2	46.88	0	0	0		0	1.5
1976	1 242	55.2	49.30	0	0	0		0	1
1977	1 279	58.4	51.35	0	0	0		0	1
1978	1 336	62.0	53.16	0	0	0		0	1
1979	1 312	67.7	55.40	0	0	0		0	1
1980	1 276	70.9	57.93	0	0	0		0	1
1981	1 309	73.3	60.57	5 343	0	0		0	1
1982	1 337	78.5	64.91	61 174	0	0		0	1
1983	1 067	81.8	64.52	219 152	0	0		0	0
1984	1 024	82.9	67.29	298 844	0	0		0	0
1985	995	84.0	69.59	291 214	0	0		0	0
1986	1 115	85.2	68.61	317 182	0	0		0	0
1987	960	86.3	67.95	318 549	0	0		0	0
1988	988	87.4	68.90	342 592	0	0		0	0
1989	985	88.5	70.89	385 081	0	0		0	0
1990	898	89.5	69.89	436 784	0	0		0	0
1991	746	90.4	67.21	499 302	100 000	0		0	0
1992	651	91.3	67.73	527 845	100 000	0		0	0
1993	596	92.2	69.26	545 516	100 000	0		0	0
1994	629	93.0	70.50	535 122	92 500	0		0	0
1995	638	93.6	72.38	575 081	90 495	0		0	0
1996	607	94.2	72.81	581 250	102 824	0		0	0
1997	584	94.7	73.23	577 961	115 977	0		0	0
1998	585	95.0	73.90	500 215	114 608	0		0	0
1999	558	95.3	74.89	451 648	139 907	0		0	0
2000	582	95.6	76.47	473 087	161 572	0		0	0
2001	549	95.9	76.37	589 175	154 689	0		0	0
2002	565	96.2	78.32	661 623	187 146	0		0	0
2003	520	96.5	79.25	751 296	200 318	0		0	0
2004	545	96.8	82.44	766 263	223 891	0		0	0
2005	503	97.1	83.72	861 893	176 999	1 271		0	0
2006	536	97.4	84.05	842 931	176 999	2 542		0	0
2007	442	97.7	86.42	927 472	175 620	3 812		0	0
2008	376	97.8	88.59	1 051 131	147 602	5 083	0.67	0	0
2009	433	97.8	89.77	1 110 216	128 404	6 221	0.61	0	0
2010	445	97.9	92.23	1 159 258	97 687	8 114	0.53	0	0
2011	355	97.9	94.28	1 130 003	97 412	8 382	0.49	0	0
2012	386	97.9	95.78	1 183 866	108 147	7 862	0.43	0	0
2013	341	97.9	97.57	1 288 284	106 726	8 570	0.40	0	0
2014	337	97.9	98.82	1 479 085	117 116	9 708	0.33	0	0
2015	304	97.9	100.41	1 529 471	121 643	15 562	0.31	0	0
2016	387	97.9	102.36	1 227 146	122 803	22 275	0.29	0	0
2017	355	97.9	104.26	1 187 994	106 376	34 672	0.34	0	0
2018		97.9	106.54	1 213 994	122 803	35 430	0.34	0	0
2019		97.9	108.89	1 240 797	125 514	36 213	0.34	0	0
2020		97.9	111.28	1 267 963	128 262	37 005	0.34	0	0
2021		97.9	113.66	1 295 062	131 004	37 796	0.34	0	0
2022		97.9	116.04	1 322 187	133 747	38 588	0.34	0	0
2023		97.9	118.36	1 348 618	136 421	39 359	0.34	0	0
2024		97.9	120.64	1 374 636	139 053	40 119	0.34	0	0
2025		97.9	122.91	1 400 519	141 671	40 874	0.34	0	0
2026		97.9	125.09	1 425 376	144 186	41 599	0.34	0	0
2027		97.9	127.11	1 448 380	146 513	42 271	0.34	0	0
2028		97.9	129.01	1 469 993	148 699	42 902	0.34	0	0
2029		97.9	130.79	1 490 284	150 752	43 494	0.34	0	0
2030		97.9	132.51	1 509 920	152 738	44 067	0.34	0	0

Source: BITRE estimates.

Table A3: Victoria model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests	Time trend Pre-1967	Dummy variable 110km/h
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)		
1965	916	2.6	19.08	0	0	0		3	0
1966	933	3.3	19.83	0	0	0		2	0
1967	963	4.4	20.90	0	0	0		1	0
1968	868	5.6	22.14	0	0	0		0	0
1969	964	6.9	23.93	0	0	0		0	0
1970	1 065	13.8	25.84	0	0	0		0	0
1971	996	29.4	27.81	0	0	0		0	0
1972	884	36.9	29.70	0	0	0		0	0
1973	949	41.8	31.21	0	0	0		0	0
1974	877	47.2	33.54	0	0	0		0	0
1975	887	52.0	35.35	0	0	0		0	0
1976	898	56.7	37.88	1 282	0	0		0	0
1977	915	60.0	39.73	5 126	0	0		0	0
1978	926	63.9	41.09	9 569	0	0		0	0
1979	842	70.0	42.01	23 239	0	0		0	0
1980	785	76.9	42.58	20 505	0	0		0	0
1981	714	81.3	43.38	17 451	0	0		0	0
1982	717	84.9	46.06	18 239	0	0		0	0
1983	709	86.4	46.23	59 721	0	0		0	0
1984	647	87.3	48.23	72 333	0	0		0	0
1985	669	87.8	50.01	88 283	0	0		0	0
1986	683	88.6	50.37	128 344	1 280	0		0	0
1987	648	89.7	51.14	149 858	4 694	0		0	0
1988	722	90.6	53.37	143 182	8 108	0		0	0.75
1989	758	91.5	56.07	193 703	5 633	0		0	1
1990	662	92.2	54.79	342 189	50 073	0		0	1
1991	489	93.1	56.28	411 925	120 896	0		0	0
1992	466	94.0	55.49	441 041	122 076	0		0	0
1993	405	94.9	56.57	562 154	108 650	0		0	0
1994	422	95.6	57.59	611 255	120 406	0		0	0
1995	378	95.9	59.10	583 298	92 954	0		0	0
1996	427	96.2	60.09	660 904	101 214	0		0	0
1997	384	96.5	61.29	676 932	97 964	0		0	0
1998	373	96.8	61.65	625 556	97 964	0		0	0
1999	402	97.1	62.94	626 814	97 964	0		0	0
2000	399	97.4	62.50	671 249	97 964	0		0	0
2001	409	97.7	63.34	732 742	97 964	0		0	0
2002	451	97.8	65.44	774 867	129 205	0		0	0
2003	366	97.8	67.07	853 794	222 930	0		0	0
2004	333	97.9	71.06	868 553	239 997	1 250		0	0
2005	335	97.9	75.47	874 626	268 442	2 501		0	0
2006	323	97.9	72.82	853 902	268 442	3 751		0	0
2007	337	97.9	74.97	834 927	268 442	5 001		0	0
2008	330	97.9	77.86	879 225	278 509	6 252	0.55	0	0
2009	301	97.9	78.44	910 375	284 148	7 021	0.50	0	0
2010	288	97.9	79.02	966 074	293 115	10 411	0.42	0	0
2011	294	97.9	79.60	878 488	287 889	10 411	0.40	0	0
2012	269	97.9	81.42	985 830	296 259	11 936	0.33	0	0
2013	255	97.9	82.62	870 725	253 997	11 936	0.33	0	0
2014	256	97.9	84.05	959 354	326 981	13 977	0.31	0	0
2015	254	97.9	85.52	765 958	326 550	26 626	0.30	0	0
2016	265	97.9	87.18	763 558	316 661	23 776	0.34	0	0
2017	264	97.9	89.16	763 558	316 661	23 776	0.34	0	0
2018		97.9	91.50	783 641	324 989	24 401	0.34	0	0
2019		97.9	93.94	804 562	333 665	25 053	0.34	0	0
2020		97.9	96.42	825 751	342 453	25 713	0.34	0	0
2021		97.9	98.91	847 081	351 299	26 377	0.34	0	0
2022		97.9	101.40	868 432	360 154	27 042	0.34	0	0
2023		97.9	103.85	889 428	368 861	27 695	0.34	0	0
2024		97.9	106.24	909 838	377 325	28 331	0.34	0	0
2025		97.9	108.52	929 376	385 428	28 939	0.34	0	0
2026		97.9	110.71	948 162	393 219	29 524	0.34	0	0
2027		97.9	112.81	966 147	400 677	30 084	0.34	0	0
2028		97.9	114.87	983 823	408 008	30 635	0.34	0	0
2029		97.9	116.90	1 001 169	415 202	31 175	0.34	0	0
2030		97.9	118.90	1 018 344	422 324	31 710	0.34	0	0

Source: BITRE estimates.

Table A4: Queensland model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests	Time trend Pre-1967	Dummy variable 110km/h
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)		
1965	464	2.1	10.14	0	0	0		0	3
1966	475	2.6	10.50	0	0	0		0	2
1967	481	3.4	11.09	0	0	0		0	1
1968	476	4.4	11.85	0	0	0		0	0
1969	525	5.4	12.93	0	0	0		0	0
1970	527	8.1	14.10	0	0	0		0	0
1971	580	16.4	15.53	0	0	0		0	0
1972	579	30.6	17.17	0	0	0		0	0
1973	625	38.1	18.83	0	0	0		0	0
1974	603	42.3	20.98	0	0	0		0	0
1975	583	44.5	22.91	0	0	0		0	0
1976	600	46.5	25.41	0	0	0		0	0
1977	588	49.6	26.45	0	0	0		0	0
1978	560	53.2	27.48	0	0	0		0	0
1979	641	59.5	28.51	0	0	0		0	0
1980	605	66.5	29.90	0	0	0		0	0
1981	559	71.3	31.30	0	0	0		0	0
1982	609	75.5	33.46	0	0	0		0	0
1983	537	77.9	33.29	0	0	0		0	0
1984	506	80.0	34.37	0	0	0		0	0
1985	535	81.8	35.45	0	0	0		0	0
1986	502	84.0	35.62	0	0	0		0	0
1987	436	86.0	36.23	0	0	0		0	0
1988	474	87.3	37.80	0	0	0		0	0
1989	478	88.6	40.40	192 848	0	0		0	0
1990	430	89.6	40.64	165 685	0	0		0	0
1991	394	90.5	40.12	172 858	9 087	0		0	0
1992	420	91.1	41.71	229 612	23 625	0		0	0
1993	382	91.7	43.58	200 535	38 163	0		0	0
1994	414	92.2	44.97	193 265	47 250	0		0	0
1995	457	92.5	46.88	174 150	47 250	0		0	0
1996	391	92.7	47.93	172 744	105 919	0		0	0
1997	397	93.0	48.63	280 593	105 919	0		0	0
1998	305	93.3	49.26	421 407	119 229	0		0	0
1999	300	93.5	49.80	551 135	123 134	0		0	0
2000	329	93.8	51.18	655 689	128 629	0		0	0
2001	309	94.0	51.62	689 357	133 767	0		0	0
2002	319	94.3	53.89	680 999	124 785	0		0	0
2003	339	94.6	55.19	729 677	142 226	0		0	0
2004	297	94.9	58.50	723 673	124 597	537		0	0
2005	312	95.2	60.17	746 813	114 180	1 075		0	0
2006	342	95.5	61.61	767 945	116 964	1 612		0	0
2007	366	95.8	64.67	771 768	120 664	2 149		0	0
2008	331	96.1	67.30	720 764	125 722	2 687	0.94	0	0
2009	351	96.4	68.09	774 666	118 968	3 122	1.06	0	0
2010	269	96.7	70.00	799 796	110 156	5 414	1.05	1	0
2011	251	97.0	70.76	842 499	147 179	6 293	0.81	1	0
2012	278	97.4	72.45	870 929	163 420	4 922	0.73	1	0
2013	297	97.4	74.29	924 172	190 726	5 197	0.68	1	0
2014	229	97.4	75.43	971 942	251 023	5 306	0.59	1	0
2015	235	97.4	76.88	893 725	269 156	9 988	0.57	1	0
2016	244	97.4	78.61	852 779	164 826	12 703	0.55	1	0
2017	252	97.4	80.94	703 259	169 080	14 499	0.58	1	0
2018		97.4	83.36	724 228	174 121	14 931	0.58	1	0
2019		97.4	85.81	745 579	179 254	15 371	0.58	1	0
2020		97.4	88.27	766 891	184 378	15 810	0.58	1	0
2021		97.4	90.68	787 861	189 420	16 243	0.58	1	0
2022		97.4	93.11	808 972	194 495	16 678	0.58	1	0
2023		97.4	95.51	829 780	199 498	17 107	0.58	1	0
2024		97.4	97.88	850 425	204 462	17 533	0.58	1	0
2025		97.4	100.29	871 372	209 498	17 964	0.58	1	0
2026		97.4	102.67	891 985	214 454	18 389	0.58	1	0
2027		97.4	104.98	912 128	219 296	18 805	0.58	1	0
2028		97.4	107.29	932 127	224 105	19 217	0.58	1	0
2029		97.4	109.61	952 318	228 959	19 633	0.58	1	0
2030		97.4	111.93	972 461	233 802	20 048	0.58	1	0

Source: BITRE estimates.

Table A5: South Australia model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)
1965	241	3.1	7.90	0	0	0	
1966	266	4.4	8.06	0	0	0	
1967	273	5.8	8.37	0	0	0	
1968	257	7.4	8.78	0	0	0	
1969	273	8.6	9.40	0	0	0	
1970	302	9.8	10.09	0	0	0	
1971	299	12.1	10.90	0	0	0	
1972	313	19.5	11.51	0	0	0	
1973	306	28.0	12.05	0	0	0	
1974	389	32.6	12.98	0	0	0	
1975	358	37.0	13.72	0	0	0	
1976	317	41.6	14.77	0	0	0	
1977	320	47.3	15.32	0	0	0	
1978	279	54.2	15.68	0	0	0	
1979	314	64.6	15.80	0	0	0	
1980	266	74.6	15.96	0	0	0	
1981	250	80.1	16.12	7 056	0	0	
1982	244	83.5	16.94	21 025	0	0	
1983	273	84.6	16.86	29 410	0	0	
1984	239	85.6	17.53	33 420	0	0	
1985	241	86.5	18.06	33 595	0	0	
1986	275	87.7	17.86	37 838	0	0	
1987	281	89.0	17.75	54 736	0	0	
1988	246	89.8	18.05	68 941	0	0	
1989	228	90.5	18.63	70 156	487	0	
1990	210	91.0	18.35	70 585	2 855	0	
1991	216	91.6	17.64	69 015	5 054	0	
1992	189	92.3	17.68	64 549	7 326	0	
1993	177	92.9	17.90	59 585	10 382	0	
1994	189	93.5	17.86	58 476	11 652	0	
1995	168	94.0	18.02	59 239	12 667	0	
1996	192	94.5	17.95	91 524	13 457	0	
1997	151	95.0	18.04	145 735	13 898	0	
1998	181	95.5	18.14	142 640	14 502	0	
1999	157	95.8	18.44	137 325	15 997	0	
2000	150	96.1	18.90	132 266	18 251	0	
2001	159	96.5	18.88	139 575	18 364	0	
2002	144	96.8	19.37	162 366	15 595	0	
2003	161	97.1	19.85	152 967	12 789	0	
2004	149	97.4	20.25	159 547	14 657	0	
2005	145	97.7	20.29	160 375	14 003	0	
2006	146	97.8	20.36	168 670	18 429	0	
2007	104	97.8	21.00	166 309	24 000	120	
2008	107	97.9	21.16	165 460	29 875	306	1.58
2009	128	97.9	21.39	179 047	26 919	511	1.53
2010	118	97.9	21.90	182 911	22 834	515	1.39
2011	111	97.9	22.04	151 181	15 465	501	1.66
2012	89	97.9	22.21	135 555	13 693	490	1.71
2013	100	97.9	22.54	131 251	18 598	568	1.69
2014	87	97.9	22.90	138 721	25 141	543	1.47
2015	113	97.9	23.18	140 806	21 321	579	1.46
2016	97	97.9	23.46	132 360	55 195	519	0.97
2017	82	97.9	24.09	129 035	57 638	484	1.01
2018		97.9	24.56	131 507	58 742	484	1.01
2019		97.9	25.04	134 100	59 900	484	1.01
2020		97.9	25.53	136 703	61 063	484	1.01
2021		97.9	26.01	139 275	62 212	484	1.01
2022		97.9	26.49	141 861	63 367	484	1.01
2023		97.9	26.95	144 339	64 474	484	1.01
2024		97.9	27.40	146 746	65 549	484	1.01
2025		97.9	27.84	149 097	66 599	484	1.01
2026		97.9	28.26	151 319	67 592	484	1.01
2027		97.9	28.65	153 404	68 523	484	1.01
2028		97.9	29.01	155 349	69 392	484	1.01
2029		97.9	29.37	157 269	70 250	484	1.01
2030		97.9	29.72	159 147	71 088	484	1.01

Source: BITRE estimates.

Table A6: Western Australia model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests	Dummy variable Pre-1974	Dummy variable 2007–2008	Dummy variable 1994–2001
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)			
1965	237	2.8	6.32	0	0	0		1	0	0
1966	246	3.6	6.54	0	0	0		1	0	0
1967	239	4.7	7.00	0	0	0		1	0	0
1968	316	5.9	7.57	0	0	0		1	0	0
1969	314	7.3	8.39	0	0	0		1	0	0
1970	329	9.3	9.28	0	0	0		1	0	0
1971	348	12.9	10.20	0	0	0		1	0	0
1972	314	20.4	11.09	0	0	0		1	0	0
1973	360	29.2	11.84	0	0	0		1	0	0
1974	349	33.8	12.88	0	0	0		0.5	0	0
1975	316	37.9	13.75	0	0	0		0	0	0
1976	297	42.3	14.87	0	0	0		0	0	0
1977	310	48.0	15.71	0	0	0		0	0	0
1978	312	54.6	16.40	0	0	0		0	0	0
1979	307	64.6	16.87	0	0	0		0	0	0
1980	277	74.6	17.41	0	0	0		0	0	0
1981	280	80.1	17.96	0	0	0		0	0	0
1982	226	83.5	19.20	0	0	0		0	0	0
1983	234	84.6	19.18	0	0	0		0	0	0
1984	207	85.5	20.09	0	0	0		0	0	0
1985	231	86.7	20.70	0	0	0		0	0	0
1986	259	87.9	20.76	168	0	0		0	0	0
1987	199	89.1	20.83	449	2 609	0		0	0	0
1988	210	89.9	21.52	613	13 184	0		0	0	0
1989	238	90.7	22.33	866	14 761	0		0	0	0
1990	238	91.3	22.20	803	15 515	0		0	0	0
1991	186	92.0	21.43	737	16 269	0		0	0	0
1992	201	92.6	21.56	691	16 920	0		0	0	0
1993	198	93.3	21.99	771	18 895	0		0	0	0
1994	212	94.1	22.68	804	26 821	0		0	0	0.5
1995	225	94.6	23.74	597	36 705	0		0	0	0.8
1996	225	95.2	24.28	641	61 990	0		0	0	1
1997	224	95.6	24.70	619	75 098	0		0	0	1
1998	203	95.9	25.08	611	105 221	0		0	0	1
1999	225	96.2	25.49	652	104 959	0		0	0	1
2000	212	96.5	25.91	764	118 751	0		0	0	1
2001	199	96.8	25.86	839	164 322	0		0	0	1
2002	171	97.1	26.66	959	137 854	0		0	0	0
2003	184	97.4	27.34	1 007	132 351	0		0	0	0
2004	168	97.7	28.68	1 041	147 016	0		0	0	0
2005	174	97.8	29.53	1 094	155 084	19		0	0	0
2006	177	97.8	29.94	1 067	138 850	38		0	0	0
2007	223	97.9	31.30	1 176	121 018	57		0	1	0
2008	221	97.9	32.34	1 430	115 699	76	2.20	0	1	0
2009	195	97.9	33.59	1 548	122 265	56	2.54	0	0	0
2010	183	97.9	34.36	1 585	135 730	71	2.10	0	0	0
2011	199	97.9	35.13	1 647	224 568	54	1.76	0	0	0
2012	177	97.9	36.12	1 702	224 558	63	1.32	0	0	0
2013	180	97.9	36.94	1 741	209 946	49	0.96	0	0	0
2014	159	97.9	37.81	1 782	228 273	80	0.89	0	0	0
2015	180	97.9	38.58	1 819	226 836	181	0.59	0	0	0
2016	169	97.9	39.56	1 638	184 641	212	0.44	0	0	0
2017	180	97.9	41.02	1 626	190 071	222	0.40	0	0	0
2018		97.9	42.42	1 681	196 539	222	0.40	0	0	0
2019		97.9	43.87	1 739	203 297	222	0.40	0	0	0
2020		97.9	45.37	1 798	210 220	222	0.40	0	0	0
2021		97.9	46.89	1 859	217 283	222	0.40	0	0	0
2022		97.9	48.45	1 921	224 512	222	0.40	0	0	0
2023		97.9	50.04	1 984	231 874	222	0.40	0	0	0
2024		97.9	51.66	2 048	239 357	222	0.40	0	0	0
2025		97.9	53.26	2 111	246 803	222	0.40	0	0	0
2026		97.9	54.85	2 174	254 151	222	0.40	0	0	0
2027		97.9	56.44	2 237	261 527	222	0.40	0	0	0
2028		97.9	58.01	2 300	268 810	222	0.40	0	0	0
2029		97.9	59.58	2 362	276 090	222	0.40	0	0	0
2030		97.9	61.16	2 424	283 372	222	0.40	0	0	0

Source: BITRE estimates.

Table A7: Tasmania model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)
1965	91	2.8	2.18	0	0		
1966	88	3.6	2.27	0	0		
1967	102	4.7	2.40	0	0		
1968	112	5.9	2.54	0	0		
1969	122	7.3	2.73	0	0		
1970	122	10.1	2.93	0	0		
1971	124	19.2	3.13	0	0		
1972	118	27.0	3.31	0	0		
1973	83	31.3	3.45	0	0		
1974	126	35.7	3.66	0	0		
1975	120	40.0	3.79	0	0		
1976	107	44.5	3.96	0	0		
1977	103	50.5	4.02	0	0		
1978	118	56.9	4.10	0	0		
1979	98	66.9	4.17	0	0		
1980	77	74.9	4.23	0	0		
1981	120	80.1	4.30	0	0		
1982	114	83.6	4.51	0	0		
1983	73	84.6	4.59	27 758	0		
1984	77	85.7	4.86	39 530	0		
1985	85	86.6	5.11	44 796	0		
1986	76	87.8	5.15	48 520	0		
1987	90	89.1	5.16	40 280	5		
1988	75	89.9	5.31	37 361	40		
1989	90	90.6	5.54	37 060	103		
1990	66	91.3	5.61	47 580	253		
1991	80	91.9	5.49	50 341	1 046		
1992	65	92.5	5.57	48 606	2 422		
1993	64	93.2	5.75	41 444	3 303		
1994	64	94.0	5.86	43 745	4 278		
1995	62	94.5	6.01	48 701	5 203		
1996	65	95.0	6.06	57 253	6 188		
1997	43	95.5	6.09	93 718	7 155		
1998	37	95.8	6.00	92 115	7 224		
1999	53	96.1	5.93	87 071	7 857		
2000	47	96.5	5.95	82 658	8 558		
2001	62	96.8	5.86	72 031	11 004		
2002	44	97.1	6.04	85 491	11 860		
2003	33	97.4	6.22	98 473	12 478		
2004	49	97.7	6.50	109 582	14 291		
2005	53	97.8	6.55	119 668	14 015		
2006	56	97.8	6.61	152 118	13 064		
2007	56	97.9	6.87	175 591	14 785		
2008	41	97.9	7.01	169 908	14 088		
2009	49	97.9	7.06	169 535	14 991	103	0.67
2010	43	97.9	7.15	153 486	16 942	230	0.83
2011	31	97.9	7.22	151 748	18 957	357	0.64
2012	19	97.9	7.31	139 964	15 719	420	0.63
2013	33	97.9	7.36	137 589	11 465	425	0.53
2014	37	97.9	7.40	137 861	11 492	455	0.50
2015	33	97.9	7.44	118 878	11 925	858	0.54
2016	41	97.9	7.49	117 403	13 418	935	0.50
2017	32	97.9	7.81	126 361	13 987	932	0.43
2018		97.9	7.93	128 274	14 198	946	0.43
2019		97.9	8.04	130 198	14 411	960	0.43
2020		97.9	8.16	132 064	14 618	974	0.43
2021		97.9	8.27	133 843	14 815	987	0.43
2022		97.9	8.38	135 583	15 007	999	0.43
2023		97.9	8.48	137 244	15 191	1 012	0.43
2024		97.9	8.58	138 820	15 366	1 023	0.43
2025		97.9	8.67	140 374	15 538	1 035	0.43
2026		97.9	8.76	141 792	15 695	1 045	0.43
2027		97.9	8.84	143 125	15 842	1 055	0.43
2028		97.9	8.92	144 359	15 979	1 064	0.43
2029		97.9	8.99	145 536	16 109	1 073	0.43
2030		97.9	9.06	146 664	16 234	1 081	0.43

Source: BITRE estimates.

Information sheet

Table A8: Northern Territory model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Positive RBT tests	Dummy variable 1966	Dummy variable HI
	(number)	(per cent)	(billion)	(number)	(number)	(per cent)		
1965	20	3.1	0.32	0	0		0	0
1966	34	4.4	0.34	0	0		1	0
1967	27	5.8	0.40	0	0		0	0
1968	18	7.4	0.48	0	0		0	0
1969	45	8.6	0.59	0	0		0	0
1970	42	9.8	0.74	0	0		0	0
1971	50	12.1	0.91	0	0		0	0
1972	53	19.5	1.04	0	0		0	0
1973	55	28.0	1.14	0	0		0	0
1974	44	32.6	1.27	0	0		0	0
1975	64	37.0	1.22	0	0		0	0
1976	51	41.6	1.52	0	0		0	0
1977	47	47.3	1.59	0	0		0	0
1978	68	54.2	1.63	0	0		0	0
1979	53	64.6	1.68	0	0		0	0
1980	63	74.6	1.82	134	0		0	0
1981	68	80.1	1.96	492	0		0	0
1982	60	83.5	2.16	851	0		0	0
1983	49	84.6	2.19	1 209	0		0	0
1984	50	85.6	2.31	1 567	0		0	0
1985	67	86.5	2.40	1 925	0		0	0
1986	71	87.7	2.36	2 283	0		0	0
1987	84	89.0	2.32	2 641	0		0	0
1988	50	89.8	2.32	3 000	0		0	0
1989	61	90.5	2.36	3 358	0		0	0
1990	68	91.0	2.30	3 716	0		0	0
1991	67	91.6	2.20	4 074	0		0	0
1992	54	92.3	2.21	4 432	49		0	0
1993	44	92.9	2.24	4 790	794		0	0
1994	41	93.5	2.26	5 109	780		0	0
1995	61	94.0	2.34	5 363	810		0	0
1996	72	94.5	2.39	5 617	1 091		0	0
1997	60	95.0	2.41	5 870	1 063		0	0
1998	69	95.5	2.42	6 124	1 084		0	0
1999	49	95.8	2.41	6 378	2 061		0	0
2000	51	96.1	2.43	6 631	3 809		0	0.2
2001	54	96.5	2.39	6 885	7 243		0	0.8
2002	44	96.8	2.45	7 139	7 529		0	0.33
2003	61	97.1	2.47	7 392	6 373		0	1
2004	45	97.4	2.55	7 646	4 415		0	0
2005	40	97.7	2.59	7 899	5 882		0	0
2006	48	97.8	2.63	10 213	6 276		0	0
2007	51	97.8	2.77	24 950	4 484		0	0.33
2008	69	97.9	2.90	27 911	5 966	2.28	0	1.1
2009	56	97.9	3.01	39 518	4 973	2.04	0	0.5
2010	35	97.9	3.10	44 657	6 694	1.72	0	0
2011	44	97.9	3.10	44 088	6 158	1.43	0	0
2012	53	97.9	3.14	41 855	6 933	1.48	0	0.67
2013	46	97.9	3.22	39 171	6 134	1.60	0	0
2014	42	97.9	3.26	43 978	5 718	1.28	0	0
2015	41	97.9	3.30	45 059	6 232	1.23	0	0
2016	44	97.9	3.35	42 905	7 415	0.98	0	0
2017	44	97.9	3.52	50 624	8 320	0.80	0	0
2018		97.9	3.62	52 042	8 553	0.80	0	0
2019		97.9	3.72	53 500	8 793	0.80	0	0
2020		97.9	3.83	55 004	9 040	0.80	0	0
2021		97.9	3.93	56 462	9 279	0.80	0	0
2022		97.9	4.03	57 898	9 516	0.80	0	0
2023		97.9	4.13	59 296	9 745	0.80	0	0
2024		97.9	4.22	60 691	9 975	0.80	0	0
2025		97.9	4.32	62 083	10 203	0.80	0	0
2026		97.9	4.42	63 462	10 430	0.80	0	0
2027		97.9	4.51	64 841	10 656	0.80	0	0
2028		97.9	4.61	66 185	10 877	0.80	0	0
2029		97.9	4.70	67 535	11 099	0.80	0	0
2030		97.9	4.79	68 878	11 320	0.80	0	0

Source: BITRE estimates.

Information sheet

Table A9: Australian Capital Territory model data

Fin. Yr	Fatalities	Seat belt wearing	Safety-weighted VKT	Random Breath Tests (RBT)	Speed camera fines	Mobile Drug Tests (MDT)	Positive RBT tests	Dummy variable 2003–2005	Dummy variable 1977–1983
	(number)	(per cent)	(billion)	(number)	(number)	(number)	(per cent)		
1965	16	1.7	0.55	0	0			0	0
1966	17	2.1	0.61	0	0			0	0
1967	23	2.8	0.69	0	0			0	0
1968	14	3.6	0.78	0	0			0	0
1969	26	4.4	0.90	0	0			0	0
1970	31	5.8	1.04	0	0			0	0
1971	20	18.0	1.19	0	0			0	0
1972	32	38.7	1.34	0	0			0	0
1973	29	47.0	1.49	0	0			0	0
1974	31	51.0	1.68	0	0			0	0
1975	32	53.2	1.85	0	0			0	0
1976	38	55.2	2.04	0	0			0	0
1977	29	58.4	2.17	0	0			0	1
1978	30	62.0	2.29	0	0			0	1
1979	24	67.7	2.38	0	0			0	1
1980	30	70.9	2.48	0	0			0	1
1981	29	73.3	2.57	0	0			0	1
1982	26	78.5	2.77	0	0			0	1
1983	28	81.8	2.82	0	0			0	1
1984	38	82.9	2.98	0	0			0	0
1985	33	84.0	3.14	0	0			0	0
1986	32	85.2	3.18	0	0			0	0
1987	36	86.3	3.23	0	0			0	0
1988	32	87.4	3.37	0	0			0	0
1989	32	88.5	3.57	4 763	0			0	0
1990	26	89.5	3.61	12 337	0			0	0
1991	17	90.4	3.58	20 002	0			0	0
1992	20	91.3	3.59	25 542	0			0	0
1993	12	92.2	3.66	24 002	0			0	0
1994	17	93.0	3.71	26 056	0			0	0
1995	15	93.6	3.79	25 935	0			0	0
1996	23	94.2	3.81	27 345	0			0	0
1997	17	94.7	3.82	33 406	0			0	0
1998	22	95.0	3.80	28 994	0			0	0
1999	19	95.3	3.84	24 942	776			0	0
2000	18	95.6	3.90	25 771	3 689			0	0
2001	20	95.9	3.87	20 961	7 143			0	0
2002	13	96.2	3.98	18 914	7 853			0	0
2003	13	96.5	4.08	16 478	6 547			0.35	0
2004	9	96.8	4.25	11 949	6 408			1	0
2005	15	97.1	4.31	14 602	7 113			0.5	0
2006	19	97.4	4.35	21 582	7 132			0	0
2007	17	97.7	4.50	23 377	8 587			0	0
2008	14	97.8	4.62	22 339	11 596	0	2.06	0	0
2009	13	97.8	4.71	22 101	14 108	0	1.79	0	0
2010	20	97.9	4.85	24 403	14 676	0	1.44	0	0
2011	10	97.9	4.93	25 054	14 180	41	1.41	0	0
2012	5	97.9	5.04	23 454	13 550	486	1.47	0	0
2013	11	97.9	5.12	34 162	12 987	561	0.99	0	0
2014	8	97.9	5.17	37 724	11 280	632	0.82	0	0
2015	11	97.9	5.23	30 354	12 660	524	0.90	0	0
2016	13	97.9	5.30	29 242	13 938	674	0.86	0	0
2017	11	97.9	5.40	29 242	13 224	555	0.78	0	0
2018		97.9	5.52	32 375	13 508	566	0.78	0	0
2019		97.9	5.65	33 138	13 827	580	0.78	0	0
2020		97.9	5.79	33 958	14 169	594	0.78	0	0
2021		97.9	5.93	34 789	14 515	609	0.78	0	0
2022		97.9	6.07	35 598	14 853	623	0.78	0	0
2023		97.9	6.20	36 379	15 179	636	0.78	0	0
2024		97.9	6.33	37 157	15 503	650	0.78	0	0
2025		97.9	6.46	37 904	15 815	663	0.78	0	0
2026		97.9	6.58	38 612	16 110	676	0.78	0	0
2027		97.9	6.70	39 319	16 406	688	0.78	0	0
2028		97.9	6.81	39 986	16 684	700	0.78	0	0
2029		97.9	6.92	40 632	16 953	711	0.78	0	0
2030		97.9	7.03	41 275	17 222	722	0.78	0	0

Source: BITRE estimates.

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