



## Understanding international road safety disparities: Why is Australia so much safer than the United States?

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### ABSTRACT

Despite similarities to the US in terms of transportation, land use, and culture, Australia kills 5.3 people per 100,000 population on the roads each year, as compared to the US rate of 12.4. Similar trends hold when accounting for distance driven and the number of registered cars. This paper seeks to understand what is behind the road safety disparities between these two countries.

The results suggest that a number of inter-related factors seem to play a role in the better road safety outcomes of Australia as compared to the US. This includes Australia's strategies related to seat belt usage and impaired driving as well as their efforts to help curb vehicle speeds and reduce exposure. Design-related differences include a much greater reliance on roundabouts and narrower street cross-sections as well as guidelines that encourage self-enforcing roads. Policy-related differences include stronger and more extensive enforcement programs, restrictive licensing programs, and higher driving costs.

Combined with a more urban population and multimodal infrastructure, Australia tends to discourage driving mileage and exposure while encouraging safer modes of transportation such as transit, at least more so than in most of the US. Australia also enacted their version of Vision Zero – called the Safe System Approach – more than a decade before similar policies began cropping up in US cities. While it is difficult to attribute recent road safety successes to any specific policy, Australia continues to expand their lead on the US in terms of safety outcomes and is a road safety example worthy of consideration.

### 1. Introduction

Road crashes take the lives of more than 1.2M people worldwide each year and purge more productive years of life than any other disease, including cancer and heart disease combined. Road safety engineers look to the safest motorized countries in the world – such as the Netherlands – but often make the argument that culturally, their approaches would never work in countries such as the US. While many of the Dutch approaches to transportation may work well in the US, we rarely get the chance to find out. This paper focuses on critically analyzing the transportation system of a country that is much safer than the US but also more similar in terms of transportation, land use, and culture than most European countries. Australia – with 5.3 road fatalities per 100,000 population as compared to the US rate of 12.4 – stands out as an ideal candidate.

In 1970, Australia's road fatality rate greatly exceeded that of the US, as shown in Fig. 1. By 1980, the two countries were dead even. Since

then, Australia has seen remarkable safety gains, far exceeding those of the US. Having adopted their version of Vision Zero in 2003 – and cut their road fatality rate by more than one-third since then – there seems to be much the US can learn from Australia. This paper seeks to figure out what those lessons might be. After a brief background section comparing the various historical road fatality rates back to 1925, I systematically analyze reasons why Australia might be safer and attempt to use data to substantiate or refute each supposition. This includes engineering, enforcement, education, and exposure. More specifically, this comparison includes differences in: vehicles with respect to issues such as seat belt legislation; roadway designs in terms of built environment, intersection, and street designs; and road users in terms of differences in travel behaviors, licensure, enforcement, and impaired driving. The discussion section then considers differences regarding the overarching road safety policies between Australia and the United States as well as some of the structural differences in governance in order to determine where Australia is finding their road safety gains.

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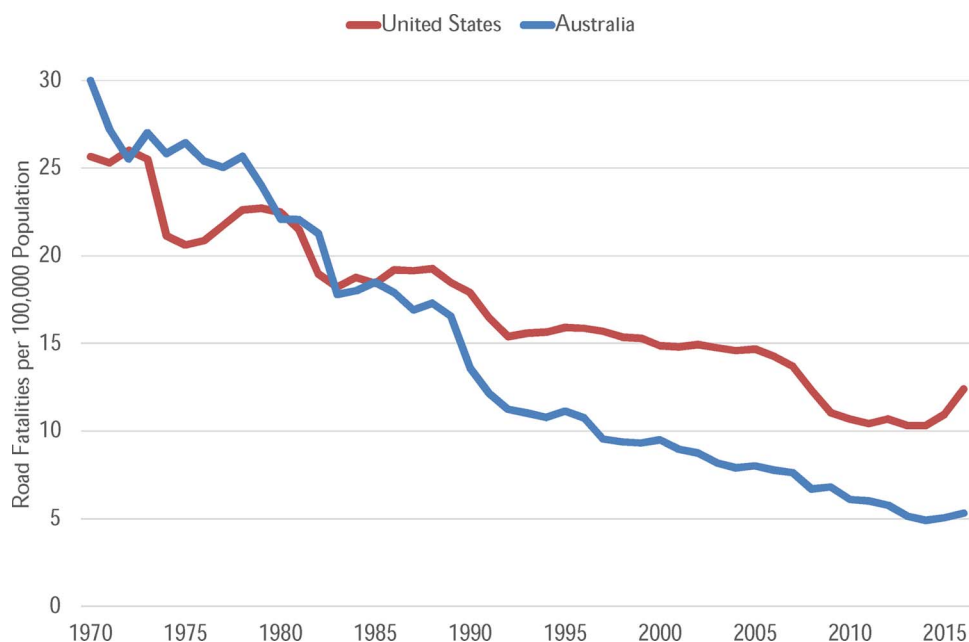


Fig. 1. Road Fatalities per 100,000 Population: US vs. Australia (1970–2016).

2. Background

2.1. Viability of Australia as a comparison to the US

Before trying to assess Australia’s current road safety successes, it seems worthwhile to further gauge its viability as a comparison to the US. The US and Australia share a common heritage in terms of being relatively young countries that were both colonized by the British. Both are now democratic societies with a federal system of government and somewhat similar divisions of power divvied to the state level (Williams and Haworth, 2007). English is the primary language in both the US and Australia even though both countries grew via historically high levels of immigration.

Some of the more prominent work on international road safety comparisons originated in Europe and focused on the SUN countries (i.e. Sweden, the United Kingdom, and the Netherlands) (Koornstra et al., 2002; Luoma and Sivak, 2014). Such papers pointed out the appropriateness of the SUN countries as comparisons to the US on the basis of similarities in economic situations and demographics (Luoma and Sivak, 2014). To assist with this overview, Table 1 compares Australia to the US and the SUN countries (IndexMundi, 2017). GDP per capita for the SUN countries, for instance, ranges from between 69% and 89% of that in the US; Australia has a GDP per capita that is just over that of the US. The Australian populations are also more similar to the US in terms of median age, the percent of the population that is elderly, and the percent of the population between the ages of 15 and 24. These latter percentages related to older and younger populations are particularly important when it comes to road safety outcomes. Both the US and Australia also have the same percentages of couples with children and relatively similar rates of adult

obesity. In terms of total area, Australia is also much closer to the US than any of the SUN counterparts. While the US population is larger, thus resulting in a much higher population density than Australia, the UK and the Netherlands have population densities that dwarf both the US and Australia. Since it is important to also recognize that population density is potentially endogenous to road safety outcomes, Section 3.2.1 on the built environment delves deeper into population density differences between the US and Australia. The same can be said regarding levels of motorization even though the US and Australia have been cited as being “sufficiently similar on these dimensions to allow reasonably valid comparisons” (Williams and Haworth, 2007). While Section 3.3.1 considers the impact of motorization in terms of travel behavior and exposure on road safety outcomes, this next section compares safety outcomes while controlling for these potential differences.

2.2. Historical comparison of US/Australia road safety outcomes via exposure metrics that control for the level of motorization

Fig. 2 depicts Australia’s road fatality rate per 100,000 population against US outcomes back to 1925. In this figure, we see that the US was generally more dangerous between 1925 and 1950, followed by Australia becoming more dangerous until 1980, and then both countries experienced remarkable safety improvements – to what might be considered historic levels of road safety during the automobile era – over the last few decades. The difference is that the road safety improvements in Australia were an order of magnitude better. If the US had the same population-based fatality rate as Australia, 23,000 lives would have been saved in just 2016 alone and over 294,000 lives in total since 2000.

Table 1 Comparison of US to Australia and SUN Countries.

Country	GDP (per capita)	Age (median)	Percent Elderly	Percent Age 15–24	Percent of Couples with Children	Percent Obesity	Total Area	Pop. Density (people per mi <sup>2</sup> )
United States	\$57,771	37.9	12.4%	13.5%	28.0%	33.0%	36,77,647 mi <sup>2</sup> (95,25,067 km <sup>2</sup> )	87.4
Australia	\$58,961	38.6	12.9%	13.0%	28.0%	26.8%	29,69,906 mi <sup>2</sup> (76,92,024 km <sup>2</sup> )	7.2
Sweden	\$51,549	41.2	17.3%	11.6%	31.0%	12.0%	1,73,732 mi <sup>2</sup> (4,49,964 km <sup>2</sup> )	57.1
UK	\$40,055	40.5	16.0%	12.2%	52.0%	26.9%	94,058 mi <sup>2</sup> (2,43,610 km <sup>2</sup> )	697.9
Netherlands	\$45,275	42.5	14.0%	12.1%	56.0%	18.8%	16,033 mi <sup>2</sup> (41,526 km <sup>2</sup> )	1,062.3

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