THE UNIVERSITY of EDINBURGH
Centre for Future Infrastructure

January 2018

Road Safety - A Sustainable Development Own Goal for the UK?

Most of the Goals and Targets of the Sustainable Development Goals (SDGs) are directed towards 2030. But a few, including road safety, have targets set at 2020 for the delivery of meaningful improvements.

The 17 SDGs and 169 supporting targets were agreed by 193 member states of the United Nations on 25 September 2015 as the defining set of objectives for the wellbeing of humankind. The SDGs officially came into force on 1 January 2016[1].

Goal 3 is "Ensure healthy lives and promote well-being for all at all ages." Target 3.6 is that "By 2020, halve the number of global deaths and injuries from road traffic accidents" – a key indicator of infrastructure performance[2]. We're now two years on from the time the commitment was made. How are we doing so far?

Let's try to unpick what was promised. The first problem is that neither the starting point from which to measure improvement nor the block of time for data to be compared was defined. The target year is 2020. Road safety data are more commonly published annually rather than quarterly, monthly or daily, so let's make our first pragmatic assumption: that the time block between successive measurements to decide whether 'halving' has been achieved, should be a year's worth of reliable data.

The United Nations made its announcement in 2015 that improvements would be made by 2020, and so the second pragmatic assumption is that the baseline year should be 2015, despite the actual data not being known at the time of the commitment, and that the comparison year should be 2020, accepting that we will be unable to judge global success until around 2022.

The target is for 'deaths and injuries' to be halved by 2020. Does that mean both deaths and injuries? Or does it mean the sum of deaths and injuries, irrespective of how much each category contributes to the total? What's the definition of an injury? Is it to be interpreted as a serious life changing injury, or any injury requiring first aid? Imprecision allows for interpretation, but let's make a third assumption: that the underlying intent is for both deaths and injuries to be halved. Given that deaths are a more clear-cut measure than injuries, tracking progress using data on road deaths should be more reliable, especially for international benchmarking purposes.

Accepting that, the target requires deaths to be halved, not death rate. It follows that countries with higher population growth rates will have a tougher job than those with a stable or declining population. Confusingly, the associated indicator 3.6.1 in the SDG system is "death rate due to road traffic injuries". No mention of injuries and death *rate* is stated rather than the absolute number of deaths (without stating how *rate* is defined – it could be deaths/accident; deaths/population; deaths/licensed vehicles or some other rate).

[1]United Nations, Sustainable Development Goals. http://www.un.org/sustainabledevelopment/sustainable-development-goals/. Accessed 30 March 2017.

[2] Infrastructure performance indicators – a new approach based on the Sustainable Development Goals. Masterton, G.G.T., Findlay, T., Wright, M. and Smith, S.D. International Symposium for Next Generation Infrastructure, London, 2017. http://isngi.org/wp-content/uploads/2017/10/ISNGI-Conference-Proceedings-v2.pdf

It's possible that behind the publicly available information on SDG progress, there is a crack team of UN statisticians that has already debated these points and made the basis of comparison crystal clear. But if that's so, it's not yet readily accessible. The suggested clarifications of definition to allow meaningful progress tracking that are made in this blog, are broadly consistent with those in Global Mobility Report 2017[3].

So, how *are* we doing against SDG Target 3.6?

The UK is one of the better performing nations in gathering accurate statistics, and 2016 data were published by the Department for Transport (DfT)[4] in September 2017. The data for Northern Ireland are less complete and are excluded to reveal progress consistently. Taking a long view, Fig 1 shows Great Britain's road traffic deaths since 1927.

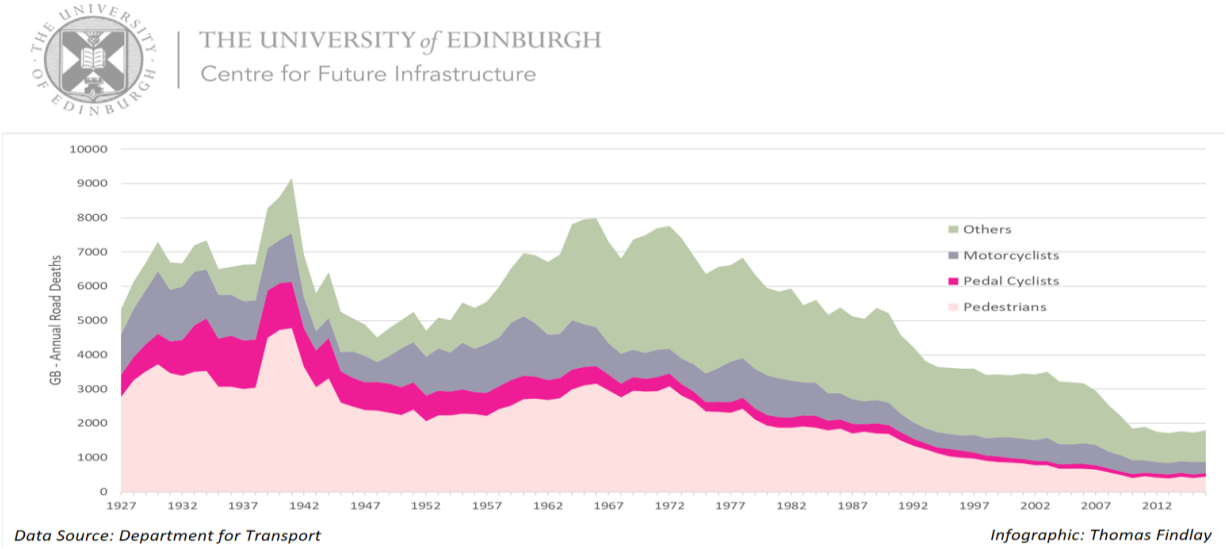


Figure 1: Great Britain - road traffic accident deaths

There have been periods when deaths rose, and others when deaths decreased despite continuing growth in population and much faster growth rate in the numbers of licensed vehicles on the road. Absolute numbers of deaths were trending downwards from the 1970s until 2010. Since then, there has been negligible improvement. The GB 2016 death toll of 1792 is the worst since 2011, as is the total of 1860 for UK including Northern Ireland.

But does a simple graph of road traffic deaths tell us enough about what we should be doing to improve? We know that the rate of improvement has slowed or even reversed since 2010. What needs to change? Vehicle safety features? Speed restrictions? Speed cameras? People attitudes? Public outrage? Policing? Penalties? New legislation? Perhaps all of the above.

Is part of the problem simply that we have more people to be nurtured through their lifespan as drivers and pedestrians? Fig 2 shows the same road death data normalised for GB population. The

[3] Sustainable Mobility for All. 2017. Global Mobility Report 2017: Tracking Sector Performance. Washington DC, License: Creative Commons Attribution CC BY 3.0

[4] https://www.gov.uk/government/collections/road-accidents-and-safety-statistics. Accessed 2 Nov 2017.

pattern is similar. Change in total population is not a dominant factor, nor is recent population growth the underlying reason for the stagnating performance in absolute numbers of deaths since 2010.

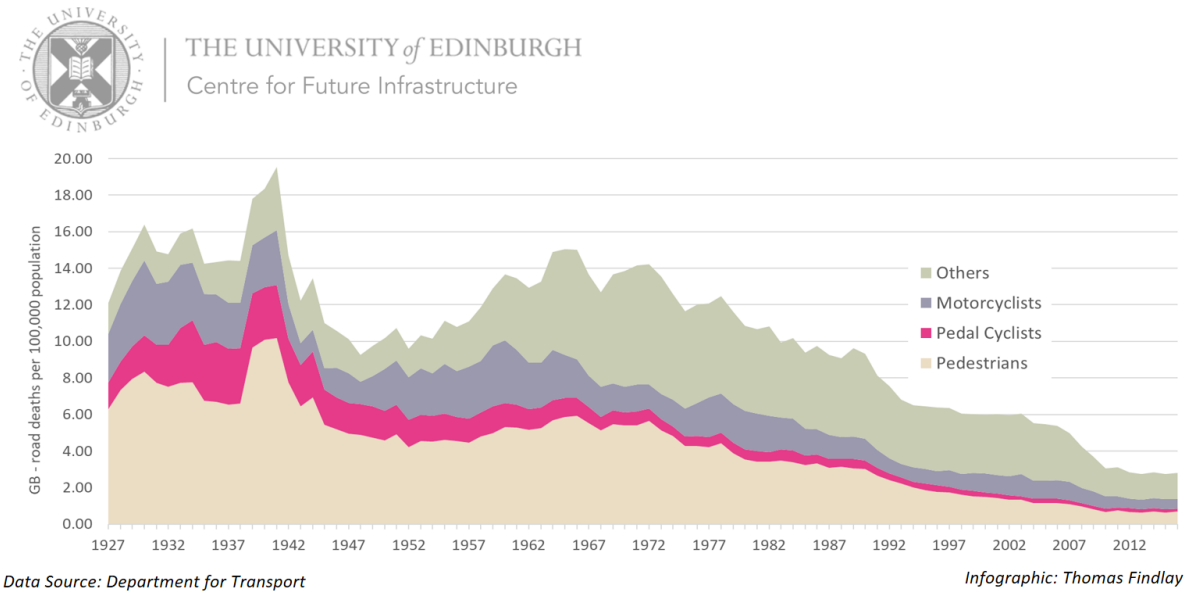


Figure 2: Great Britain - road traffic accident deaths per 100,000 population

Road deaths are the consequence of unplanned catastrophic encounters between people *and* vehicles. Fig 3 normalises for both GB population *and* number of licensed vehicles.

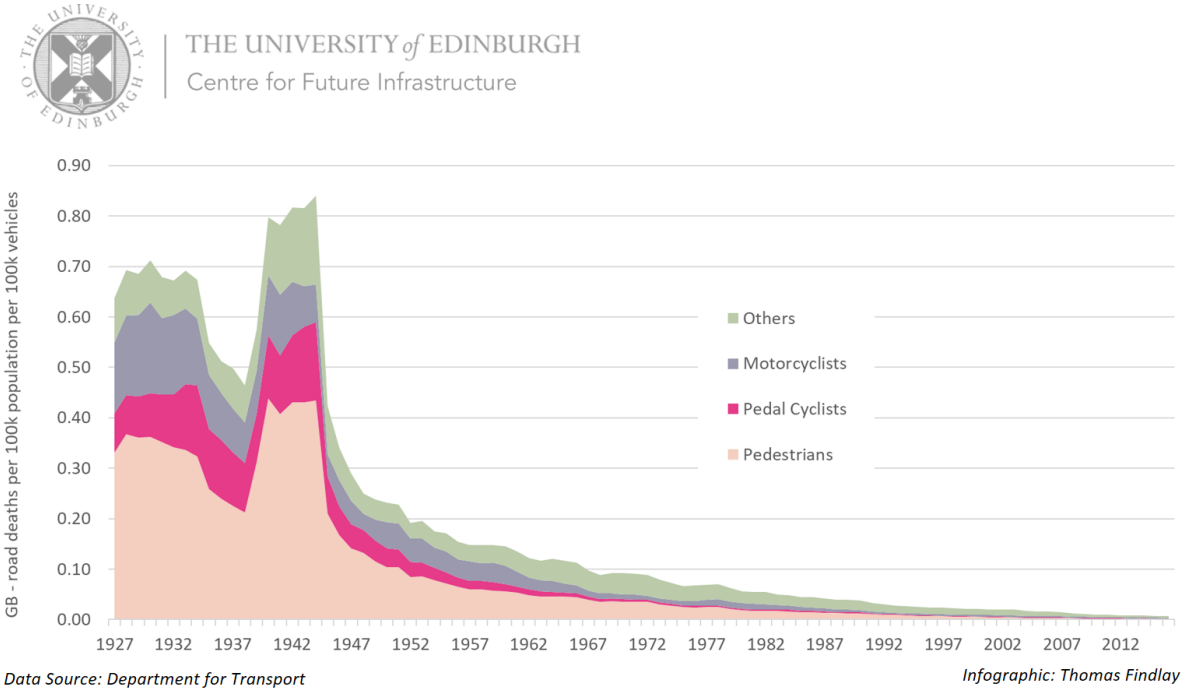
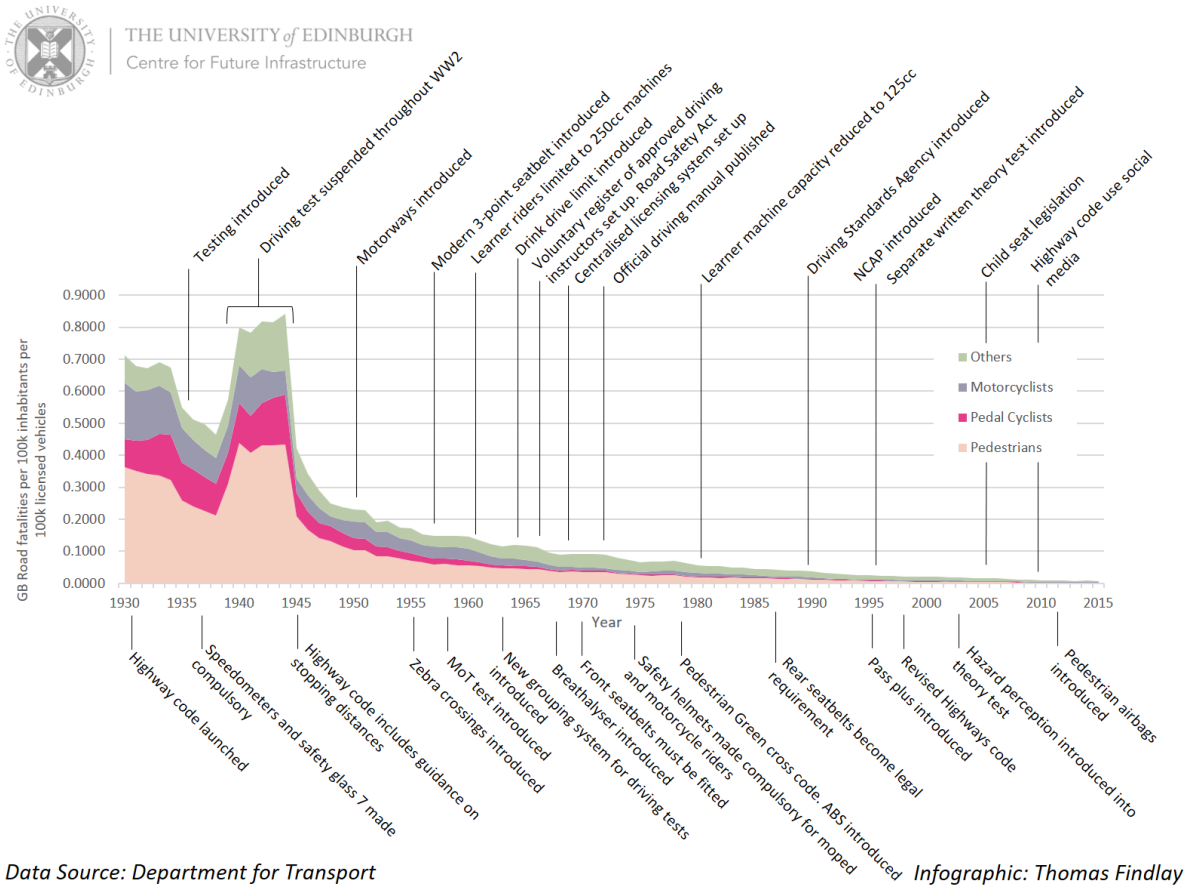


Figure 3: Great Britain - road traffic accident deaths per 100,000 population per 100,000 vehicles

This graph reveals the significant improvement in road deaths rate per head of population per number of licensed vehicle since 1945, despite the post-war surge in vehicle ownership. The dominant factor behind the increase in the absolute number of deaths from 1945-66 was the overwhelming rise in vehicle ownership. Since 1945, there has been, by and large, steady systemic improvement in reducing the rate of those unplanned catastrophic encounters between people and vehicles.

The period that defies the steady improvement trend since 1930 is the sudden surge between 1939 and 1945 - a reflection of wartime emergency measures. Driving tests were suspended, blackouts enforced, and in the drive to produce and transport war materiel, vehicle mileage increased. The data also suggest that vehicle licensing rules, or their observance, were relaxed. By today's standards there was also a different attitude to drinking and driving leading perhaps to young servicemen on home leave being an added hazard. But whether it was the blackout or relatively untrained, fatalistic young men with excess blood alcohol levels in control of less regulated vehicles, 1941 was certainly the most dangerous year in UK history for road users with 9,169 deaths, pedestrians accounting for more than half. It took the restoration of peace and normality to return to steady improvement.

Fig 4 overlays some of the principal road safety measures implemented since 1930.



Data Source: Department for Transport *Infographic: Thomas Findlay*

Figure 4: Great Britain – some road safety initiatives since 1930

Frustratingly for infrastructure researchers, it is very difficult to create laboratory-controlled conditions where bright ideas are tested on a sample population and compared with the business-as-usual dataset; especially when national measures such as changes in legislation are being introduced.

Devolved decision making may offer emerging opportunities for large scale comparisons of policy differences between regional populations but, in general, UK measures to improve road safety, such as legislation, safety campaigns, improving driver competency, vehicle design enhancements and infrastructure developments, have been rolled out nationally. It is virtually impossible to identify the impact of any single measure, but the cumulative effect over the long term has been very positive. The probability of a UK resident being killed in a road traffic accident today is 1/7 of what it was in 1941, despite there being 15 times more licensed vehicles on the roads and a 36% larger population.

And surely it is the reduction of deaths that is the honourable goal. We should continue to try out as many measures as we can conceive, accepting that some may be more successful than others, and that it's difficult to measure an indisputable causal relationship. An outcome of progressively reducing deaths is far more important than establishing confident correlation.

Let's step away from the long view and look more closely at recent years, and return to the metric of absolute numbers. The rate of improvement in recent years is less impressive. GB road safety performance has plateaued since 2010. (Fig 5). 2016 was our worst year for road deaths since 2011.

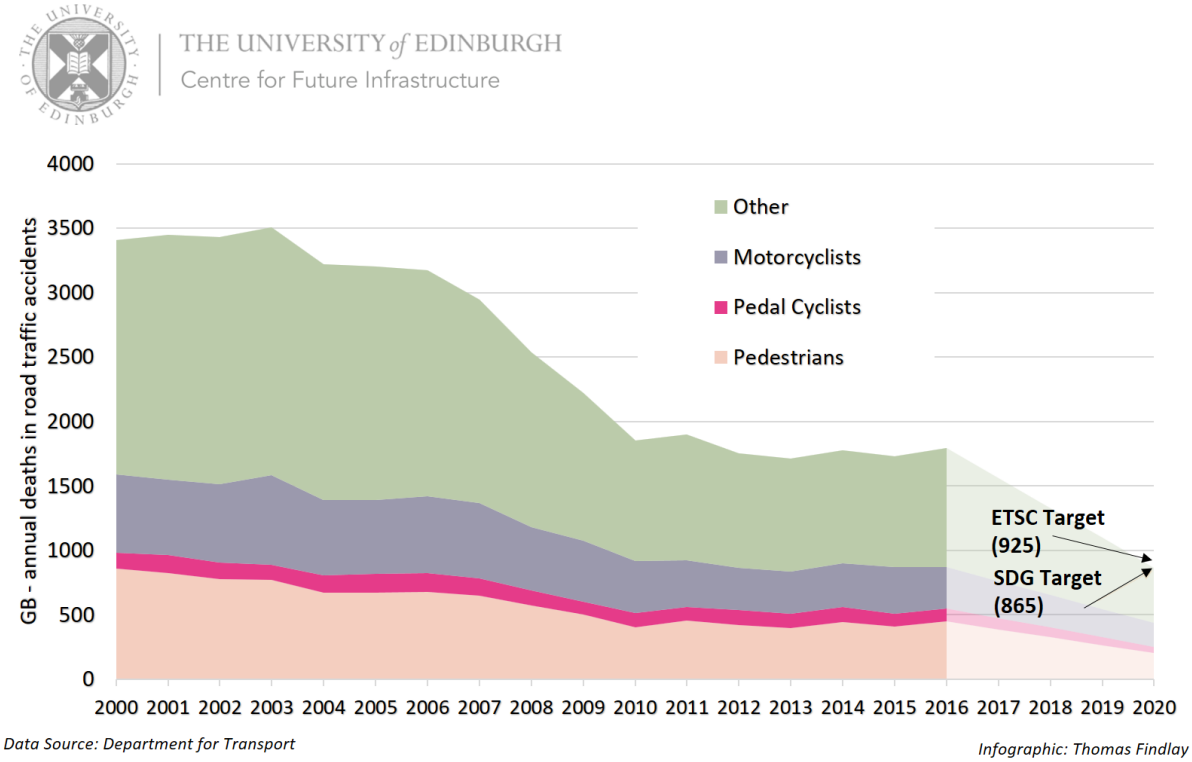


Figure 5: Great Britain – annual road traffic accident deaths 2000-16 and targets for 2020

So, are we likely to hit the SDG target? Fig 5 also projects forward to 2020 and plots where we need to get to. By eyeballing recent trends it's easy to see whether we're on track, or whether we need to do things differently and better. It's clear that a sharp improvement on 2010-16 trended performance is required if we are to meet the SDG target. The House of Commons International Development Committee said in June 2016: "We are particularly concerned that the SDGs have not been included in the 2015–2020 Single Departmental Plans of all government departments, which indicates a worrying

lack of engagement in the SDGs across Government. Departments should be assigned specific responsibilities for making progress on the SDGs to ensure ownership and clear lines of accountability and these should be laid out clearly in each department's Single Departmental Plan, with specific references to relevant SDGs"[5]. Has DfT incorporated any targets into its forward plan? It seems not, although in 2010, the European Transport Safety Council (ETSC), which has UK-based members including the Parliamentary Advisory Council for Transport Safety, and Transport Scotland, set a target of reducing road deaths by 50% by 2020, compared to 2010 levels[6]. This target has been added to Fig 5. It is marginally less stretching than the SDG Target. Commendably, Highways England has a target for Killed and Seriously Injured on the Strategic Road Network in 2020 to be 40% less than the 2005-9 average baseline[7]: that's softer than SDG and ETSC targets, but at least it's a target and drives action.

How are we benchmarked against our peers? From OECD data, UK road safety death rate per inhabitant has been consistently better than the other G7 countries between 1994 and 2015 (Fig 6), although the performance gap has narrowed. 2016 comparative data are not yet published by OECD but UK 2016 data have been added.

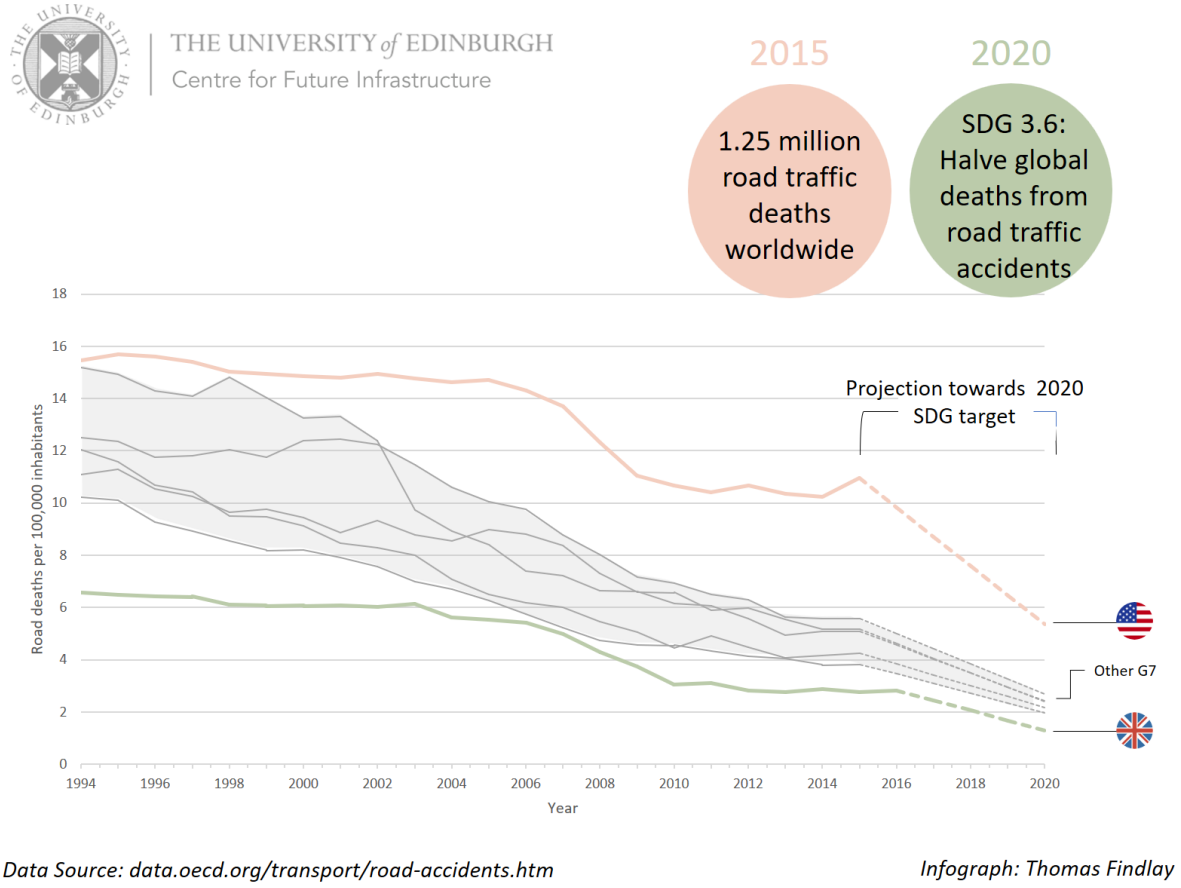


Figure 6: G7 Countries - road deaths 1994 to 2015

[5] UK implementation of the Sustainable Development Goals First Report of Session 2016–17. House of Commons International Development Committee. June 2016.
[6] 11th Road Safety Performance Index (PIN) Report. European Transport Safety Council. 2017.
[7] Highways England Operational Metrics Manual. January 2018.

The slowdown in improvement since 2010 is evident for the UK and USA, somewhat less so in other G7 countries.
To halve the number of deaths between 2015 and 2020 would require a 15% improvement each year, but performance since 2010 gives little comfort that this will be achieved by the world's seven largest advanced economies. All G7 members are currently trending to miss the target, with the USA perhaps facing the biggest challenge, and we now know that the UK has failed to improve in 2016. There are still three years left to do something dramatically different. The data suggest that doing more of the same will fail.

Can we still hit the SDG target, or even the ETSC target? Perhaps, but only with a strong commitment to succeed and a recognition of the social and economic importance of reducing avoidable deaths on a large scale, which in turn requires inspired leadership from industry and policy-makers.

Improvement rates of the order required were achieved in the UK and USA between 2006 and 2009, so it's not a forlorn hope. But on recent trends, without a step-change improvement, this might be our first Sustainable Development Own Goal.

Gordon Masterton

Centre for Future Infrastructure

Edinburgh Futures Institute

The University of Edinburgh