

How many road deaths is too many?

The challenge of meeting road safety targets

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Targets to 2020 and 2030

In 2010 the United Nations General Assembly adopted Resolution 64/255 which declared the period 2011–2020 as the 'Decade of Action for Road Safety'. The goal was to stabilize and then reduce the forecast level of road traffic fatalities around the world by increasing road safety activities conducted at the regional, national and global levels (United Nations, 10 May 2010). In September 2019, the Sustainable Development Goals Summit reiterated that more needs to be done to usher in a second Decade of Action for 2021–2030 (United Nations, 2019).

Specific casualty reduction targets were adopted through the 2030 Agenda for Sustainable Development. This agenda includes 17 Sustainable Development Goals (SDGs) and 169 targets to stimulate action over the 15 years from 2015 in areas of importance for humanity and the planet (United Nations, 2015) and road safety is mentioned in both Goal 3 (Ensure healthy lives and promote well-being for all at all ages) and Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable). Specifically, the following targets have been defined:

- By 2020, halve the number of global deaths and injuries from road traffic accidents (Goal 3, target 3.6, p.20)
- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons" (Goal 11, target 11.2, p.26)

Progress towards target 3.6 in SDG Goal 3 is being monitored using the number of fatalities in road traffic crashes per 100,000 population (United Nations, 2018) – see Figure 1.

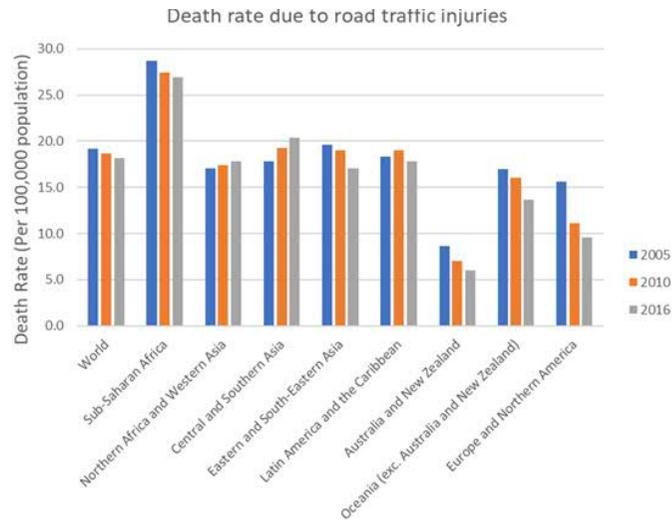


Figure 1: Road traffic fatalities per 100,000 population, 2005, 2010 and 2016 (United Nations, 2020)

This shows that between 2010 and 2016 there was little progress towards a reduction in most regions (the obvious exceptions being Europe, North America, Australia and New Zealand). In fact, the death rate increased in some regions, in particular in Central and Southern Asia.

Overall, there was a worldwide reduction in fatalities per 100,000 population from 19.2 in 2005 to 18.2 in 2016. Nevertheless, unless there has been rapid progress since 2016, it is unlikely that the target to halve the global death rate from road traffic crashes will be met.

This poses questions as to whether policy makers in some of the worst performing regions have done enough to understand the road safety problem in their counties and take steps to reduce the casualty burden.



Estimating the potential impact of road safety interventions

TRL has spent three quarters of a century understanding road safety problems in different countries and in helping policy makers to prioritise and implement regulations which save lives.

Recent modelling work by TRL (Wallbank, Kent, Ellis, Seidl, & Carroll, 2018) has shown that in four countries in Latin America (Argentina, Brazil, Chile and Mexico), the implementation of minimum standards for vehicle safety could save around 37,500 lives by 2030 and would be cost-beneficial in the region. This work demonstrates that measures such as these, which are already implemented in many high-income countries, could contribute substantially to road safety targets.

Two earlier studies (Cuerden et al., 2015; Wallbank et al., 2016), focusing only on secondary safety regulations, have demonstrated that studies of this kind can be used to encourage governments to adopt regulations: since these studies were published, three of the four countries now have in place (or soon plan to implement) the UN regulation for frontal impact protection and the equivalent for side impacts for vehicles sold in their markets.

Despite this positive influence, this work has also demonstrated that changes to regulations can take time to implement, and even more time for the changes to infiltrate the fleet and for casualty benefits to be realised. As a result, it is imperative that countries do not delay crucial road safety policy decisions.

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Prioritising effective interventions

In 2017 the World Health Organisation published their Save LIVES document (World Health Organisation, 2017) which lists the key evidence-based measures likely to impact deaths and serious injuries in the short and long term. It is now vital that policy makers, particularly those in low- and middle-income countries, initiate implementation of some of these interventions in order to reduce the number of people that die on the roads each year. We recognise however, that road safety funding is often in short supply and as such, countries may not be able to afford to implement all the measures outlined in the Save LIVES package. As a result, each country should take steps to prioritise the interventions which would be most successful in their given road safety context.

The [UN Global Road Safety Model SafeFITS](#) (Safe Future Inland Transport Systems) has recently been published to help facilitate this. This tool uses data on road safety indicators and measures to forecast the number of casualties which would be expected following the implementation of a specific safety measure (or combination of measures). These figures can be compared with the 'no change' scenario to determine how many fatalities may be prevented, and thus which measures would be most effective for each country.

This however, is only the first step. Often policy decisions require more detailed analysis of both the benefits (in this case, the casualty reduction) and the costs associated with any change, enabling the most promising interventions to be identified for a given level of resourcing available.





Cost-benefit analysis

As discussed above, TRL has recently carried out cost-benefit analysis for vehicle safety regulations in Latin America, and has previously done similar analysis for other road safety interventions: electronic stability control in the G20 countries (Hynd, et al., 2018), the European Commission's General Safety and Pedestrian Safety Regulations (Seidl, et al., 2018), vehicle head restraints (Hynd, Carroll, & Bartlett, 2007) and truck front end designs (Martin, et al., 2017). These studies were all designed to provide robust evidence of the cost-benefit for these measures, which could then be used to lobby governments, manufacturers, road designers, regulatory bodies and road safety education, enforcement and technology providers to implement measures which will be effective at reducing road accident casualties in the given country.

The main outcomes of cost-benefit analysis are the Net Present Value (NPV) and Benefit-Cost Ratio (BCR). The NPV takes into account all benefits and costs discounted to a single reference year and based to a guided price year. This ensures the comparability between of benefits and costs within the appraisal or evaluation period. On the other hand, the BCR expresses value for taxpayers' money. A BCR of 1.5, for example, indicates a that for £1 of public money invested, the public can expect a £1.5 return. These metrics help decision makers understand the likely economic consequences of policy proposals and make informed and objective decisions.

Key data challenges

Besides market analysis, safety-related data are also important in estimating casualty figures and associated costs. The first key challenge is to obtain exposure data. For example, the number of road accident casualties is likely to be influenced by the number of vehicles on the road (more casualties are expected when there are more vehicles) and/or the amount of traffic (typically measured in vehicle-kilometres travelled). However, these data can be hard to obtain for some countries, so proxy measures (e.g. population estimates) may be used instead. It is vital to understand the likely growth in these measures of exposure to be able to forecast casualty trends reliably for both the 'Do Nothing' and 'Do Something'.

In addition to challenges with exposure data, reliable road accident casualty data can be difficult to obtain and the data available are sometimes sparse; implementation costs can be commercially sensitive (e.g. technology costs for vehicle manufacturers) and, if implementing more than one intervention at a time, care must be taken not to over-estimate the casualty savings by double counting casualties which could be saved by more than one measure. These interactions and overlaps mean permutations of proposed safety regulations require additional considerations on the magnitude of overlaps and influence the resulting benefit-cost ratios and net present values.





Meeting road safety targets

Assumptions, sensitivity and caveats

The above challenges mean that robust evidence bases within cost-benefit analysis rely on reasonable assumptions on market growth, exposure and casualty data. These assumptions need to be thoroughly explained in the analysis. Furthermore, sensitivity analysis is necessary to account for the uncertainty around the data, possibly due to disruptions in markets in the future. For example, we know there is a relationship between the economy and road safety (Wegman, et al., 2017). Therefore, severe changes to the economic landscape could affect vehicle uptake, and the amount and way in which people drive, which in turn affects the cost-benefit of certain measures. This level of disruption is typically difficult to predict or capture within the models and thus results must be presented with appropriate caveats. The COVID-19 pandemic is an apt example that illustrates the major shift from public transport to private car ownership in a relatively short time period.

Where it is difficult to make reasonable assumptions or conduct sensitivity analysis given the absence of adequate data, caveats should be clearly made about what would likely happen if real data in the future turn out to diverge from the assumptions reasonably set out at the time of the appraisal. In 2020, TRL conducted work for the UK's Department for Transport regarding the use of red flashing lights by the recovery industry under specific circumstances. The analysis highlighted the importance of considering these caveats given a lack of historical data of injuries suffered by roadside recovery operators.

Following appraisal guidelines at state and regional levels

TRL recognises that a range of appraisal guidelines are in place for various geographical and jurisdiction levels. These guidelines cover areas including the use of discount rates, appraisal periods, treatment of indirect tax and inflation. We follow all pertaining guidelines in ensuring the delivery of robust analysis and policy recommendations. For example, UK proposals are typically subject to a 3.5% per annum discount rate, and EU analysis can be subject to as high as 5.5%.

This paper has so far focused on targets and analysis at the EU or state level. However, there are also benefits to carrying out analyses at smaller geographic levels (e.g. for cities or regions). TRL has previously carried out [analysis of a range of vehicle safety measures](#) for Transport for London (Wallbank, et al., 2015), demonstrating the casualty benefits of implementing these in the London fleet. Although cities may not always have the power to implement laws, these studies can be used as an evidence base to encourage the organisations which do have these powers to implement regulations or policies which reduce road accident casualties.

Carrying out analysis at these more granular levels of geography can also help to identify where priorities for a city may not directly align with the priorities for the country. For example, work by the ITF Safer Cities programme has highlighted that in cities around 78% of fatalities are vulnerable road users (e.g. pedestrians and cyclists), but at a national level this is only around 43% (International Transport Forum, 2020). This would suggest that the priority measures to reduce the overall number of road accident casualties may differ at each level, and thus a cost-benefit analysis specifically for a given city could help highlight the required investment and likely benefit. The revision to [London's Bus Safety Standards](#) are a good example of this approach.





Decisions and options ranking

As mentioned at the beginning of this section, the aim of cost-benefit analysis is to produce a Net Present Value (NPV) and/or Benefit-Cost Ratio (BCR). In assessing a single proposal, these outputs help policy makers to decide whether or not to implement the proposed scheme.

In a multi-option assessment, NPVs and BCRs can be used to rank the proposed options or permutations of them, taking into account potentially overlapping costs and benefits.

The usefulness and fairness of cost-benefit analysis makes it clear that over the coming decade (2020–2030) such analysis will be important in helping to determine whether the next set of global road safety targets is likely to be met.

UN Targets to 2030

Building on the SDGs and associated targets, Member States of the United Nations met in November 2017 and by consensus accepted a set of voluntary global performance targets for road safety risk factors and service delivery mechanisms (World Health Organisation, 21 November 2017). These set out 12 specific targets up to 2030, covering the 'safe system' pillars of road safety management, safer roads and mobility, safe vehicles, safe road users and post-crash response.

Many of these performance targets are challenging and, if they are to be achieved by 2030, they require all countries to take steps to reduce risk and road traffic injuries.

Target for the First decade of action:

By 2020, all countries should establish a comprehensive multisectoral national road safety action plan with time-bound targets.

Targets for the Second decade of action – by 2030:

1. All countries accede to one or more of the core road safety-related UN legal instruments.
2. All new roads achieve technical standards for all road users that take into account road safety or meet a three-star rating or better.
3. More than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.
4. 100% of new (defined as produced, sold or imported) and used vehicles meet high quality safety standards, such as the recommended priority UN Regulations, Global Technical Regulations, or equivalent recognized national performance requirements.
5. Halve the proportion of vehicles travelling over the posted speed limit and achieve a reduction in speed-related injuries and fatalities.
6. Increase the proportion of motorcycle riders correctly using standard helmets to close to 100%.
7. Increase the proportion of motor vehicle occupants using safety belts or standard child restraint systems to close to 100%.
8. Halve the number of road traffic injuries and fatalities related to drivers using alcohol, and/or achieve a reduction in those related to other psychoactive substances.
9. All countries have national laws to restrict or prohibit the use of mobile phones while driving.
10. All countries to enact regulation for driving time and rest periods for professional drivers, and/or accede to international/regional regulation in this area.
11. All countries establish and achieve national targets in order to minimize the time interval between road traffic crash and the provision of first professional emergency care.



European Targets to 2030

On 18th May 2018 the European Commission set a new EU target to halve road deaths, and for the first time, serious injuries in the decade to 2030. This was announced alongside the proposal for a package of new vehicle safety standards that could prevent more than 2000 deaths every year by 2032, ten years after the measures come into force.

Some countries, Great Britain (GB) and the United States (US) included, no longer have national casualty reduction targets. The ETSC state that countries that have managed to improve road safety have typically been aided by setting targets, and reporting on progress towards these (European Transport Safety Council, 2017) and as a result, by failing to set national targets, some country's road safety progress has stalled. For example, Figure 2 shows the number of fatalities between 2010 and 2019 in GB – the trend has remained almost flat for the past seven years.

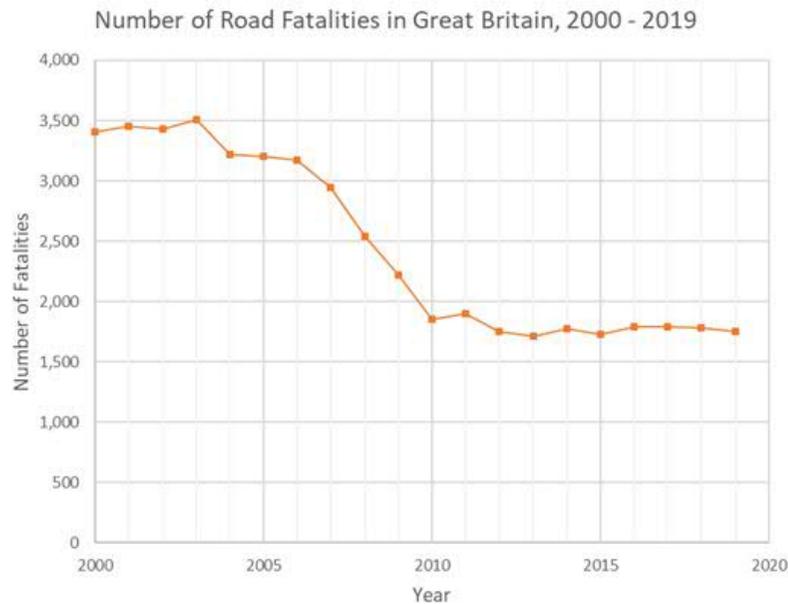


Figure 2: Number of road traffic fatalities in GB, 2000–2019

Whilst some GB road authorities, including Highways England, Transport for London and many local authorities, have set road safety targets for the coming decades, the Department for Transport (DfT) has indicated commitment to safety should be more important than targets (Department for Transport, 2019).

With no joined-up picture of what should be achieved across the whole of the UK, one has to question whether such a state of affairs will help or hinder efforts to ensure that GB remains near the top of the world rankings in terms of fewest road deaths per million population.

As outlined in the 2015 RAC report on road safety since 2010, many local authorities are calling for national targets and the approach to road safety to be co-ordinated (Amos, Davies, & Fosdick, 2015).

“Many local authorities are calling for national targets and the approach to road safety to be co-ordinated”



Meeting road safety targets

More recently, the Parliamentary Advisory Council for Transport Safety (PACTS) proposed a set of 8 indicators (Parliamentary Advisory Council for Transport Safety, 2018):

1. Traffic complying with speed limits on national roads
2. Traffic complying with speed limits on local roads
3. Drivers who do not drive after consuming alcohol or drugs
4. Car occupants using a seat belt or child seat
5. Drivers not using an in-car phone
6. Passenger cars with highest safety rating
7. Major roads with appropriate safety ratings
8. Emergency medical services arriving at priority accident scenes within 18 minutes.

To advance the UK towards attainment of its goals in reducing road casualties, TRL believes that further work should be undertaken to support a national strategy which identifies and prioritises effective interventions, and demonstrates how these interventions are cost-beneficial in the current UK road safety context. There is a desperate need for greater use of formal evaluation in road safety, particularly in education and training approaches.

While some valuable projects are proceeding (for example the 'Driver2020' scientific evaluation of young driver interventions – see www.driver2020.co.uk) much more work is urgently needed to reduce unnecessary deaths and serious injuries on UK roads.

Fundamentally, TRL recommends the implementation of a comprehensive safe-system approach that includes all elements of safe speeds, safe vehicles, safe road users (including a different approach for different user groups), safe roads and good post-crash response.

References

- Amos, L., Davies, D., & Fosdick, T. (2015). Road Safety Since 2010. London: RAC Foundation. Retrieved from https://www.racfoundation.org/assets/rac_foundation/content/downloadables/Road_Safety_Since_2010_Amos_Davies_Fosdick_PACTS_RAC_Foundation_final_report_September_2015.pdf
- Department for Transport. (2019). The Road Safety Statement 2019: A Lifetime of Road Safety. London: UK Department for Transport. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/817695/road-safety-statement-2019.pdf
- European Transport Safety Council. (2017, November 25). UN agrees on road safety sub-targets to aid progress on 2020 sustainable development goals. Retrieved from ETSC: <https://etsc.eu/un-agrees-on-road-safety-sub-targets-to-aid-progress-on-2020-sustainable-development-goals/>
- Hynd, D., Carroll, J., & Bartlett, R. (2007). UK cost-benefit analysis: enhanced geometric requirements for vehicle head restraints. Crowthorne: Transport Research Laboratory.
- Hynd, D., Wallbank, C., Kent, J., Ellis, C., Kalaiyarasan, A., Hunt, R., & Seidl, M. (2018). Costs and Benefits of Electronic Stability Control in Selected G20 Countries. Crowthorne: Transport Research Laboratory.
- International Transport Forum. (2020). Monitoring Progress in Urban Road Safety. International Transport Forum Policy Papers, No. 79. Paris: OECD.
- Martin, P., Knight, I., Hunt, R., O'Connell, S., Cuerden, R., & McCarthy, M. (2017). Study on Enhanced Truck Front End Designs (TFEDs) – Safety Benefits for Vulnerable Road Users (VRUs). Brussels: European Commission.
- Parliamentary Advisory Council for Transport Safety. (2018). Developing safe system road safety indicators for the UK. London: Parliamentary Advisory Council for Transport Safety. Retrieved from https://www.pacts.org.uk/wp-content/uploads/PactsReport_-_Developing-Safe-System-Road-Safety-Indicators-for-the-UK_Oct18-FINAL.pdf
- Seidl, M., Khatry, R., Carroll, J., Hynd, D., Wallbank, C., & Kent, J. (2018). Cost-effectiveness analysis of Policy Options for the mandatory implementation of different sets of vehicle safety measures – Review of the General Safety and Pedestrian Safety Regulations – Technical Annex to GSR2 report SI2.733025. Brussels: European Commission.
- United Nations. (10 May 2010). Resolution A/RES/64/255. Improving global road safety. Sixty fourth session of the United Nations General Assembly. New York. Retrieved from http://www.who.int/violence_injury_prevention/publications/road_traffic/UN_GA_resolution-54-255-en.pdf
- United Nations. (2015). Transforming our World: The 2030 Agenda for Sustainable Development. United Nations. Retrieved from <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>
- United Nations. (2018, May). SDG Indicators – Metadata repository. Retrieved from unstats.un.org/sdgs/metadata/
- United Nations. (2019). Resolution A/HF/PPF/2019/L.1. New York: United Nations. Retrieved from <https://undocs.org/en/A/HLPF/2019/L1>
- United Nations. (2020). The Sustainable Development Goals Report 2020. New York: United Nations. Retrieved from <https://unstats.un.org/sdgs/files/report/2020/secretary-general-sdg-report-2020--Statistical-Annex.pdf> (page 31)
- Wallbank, C., Kent, J., Ellis, C., Seidl, M., & Carroll, J. (2018). The potential for vehicle safety standards to prevent deaths and injuries in Latin America. Transport Research Laboratory.
- Wallbank, C., Lloyd, L., Scoons, J., Muirhead, M., McCarthy, M., Carroll, J., & McRae-McKee, K. (2015). Vehicle Safety Design Features and Future Safety Benefits in London. Crowthorne: Transport Research Laboratory.
- Wegman, F., Allsop, R., Antoniou, C., Bergel-Hayat, R., Elvik, R., Lassarre, S., . . . Wijnen, W. (2017). How did the economic recession (2008–2010) influence traffic fatalities in OECD-countries? Accident Analysis and Prevention, 102, 51–59.
- World Health Organisation. (2017). Save LIVES – A road safety technical package. Geneva: World Health Organisation.
- World Health Organisation. (21 November 2017). Report of the Meeting of Member States to conclude the work on the development of voluntary global performance targets for road safety risk factors and service delivery mechanisms. Meeting of Member States to conclude the work on the development of voluntary global performance targets for road safety risk factors and service delivery mechanisms. Geneva: World Health Organisation. Retrieved from http://www.who.int/violence_injury_prevention/road_traffic/Report-of-the-meeting-of-member-states.pdf?ua=1

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Specific casualty reduction targets were adopted through the 2030 Agenda for Sustainable Development, including 17 Sustainable Development Goals (SDGs) and 169 targets to stimulate action over 15 years.

The UN's Voluntary global performance targets for road safety risk factors and service delivery mechanisms built on the SDGs and associated targets. These set out 12 specific targets up to 2030, covering the 'safe system' pillars of road safety management, safer roads and mobility, safe vehicles, safe road users and post-crash response.

This paper predominantly focuses on discussion and analysis of road safety targets at an EU/state level. However, the benefits to carrying out analyses at smaller geographic levels are considered, especially in cases where priorities for a city may not directly align with the priorities for the country.

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