USA Traffic Safety Provides Examples Worth Copying and Worth Avoiding

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Abstract

After presenting a brief history and overview of safety in the USA, this paper identifies one area of US experience worth copying and one worth avoiding. The one worth copying is the collection of national data sets of high quality that are easily accessible by all on the Internet, such as the Fatality Analysis Reporting System (FARS). A worked example is given in detail so that readers can quickly acquire the skill to extract desired information from FARS. The area worth avoiding is US traffic safety policy, which is a catastrophic failure. Prior to the mid 1960s the US had the safest traffic in the world, whether measured by deaths per registered vehicle or deaths for the same distance of travel. The US has now dropped from rank number one to rank 20 for deaths per registered vehicle and to rank 13 for deaths for the same distance of travel. US policy has obsessively focused on vehicles and vehicle factors which research shows to be of relatively minor importance. Countries, including China, that have focused more on driver behavior factors have achieved progress far superior to that in the US. The

conclusion is to copy the US in creating national data sets, but to avoid the US approach to safety policy.

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Introduction

After presenting a brief history and overview of safety in the USA, this paper identifies one area of US experience worth copying and one worth avoiding.

These are my personal judgments, and reflect the conclusions about what is important in traffic safety documented in my book *Traffic Safety* [Evans, 2004].

Brief history

Before the beginning of the 20th century there were many manufacturers of automobiles propelled by internal-combustion engines burning gasoline. As these vehicles were manufactured one at a time by skilled craftsmen they cost more than an average American could afford. This made them available only to the relatively well to do. In 1900 there were only 8,000 automobiles in the USA. By 1912 the number was still under one million.

In 1913 a dramatic change came to successful fruition near Detroit, Michigan. Henry Ford started the first really effective moving assembly line to mass produce cars. This so reduced production costs that vehicles could be offered for sale at prices that a substantial portion of the US public could afford. By 1925 there were more than 20 million vehicles in the US. Thus the US became a substantially motorized nation far ahead of other countries. With over a hundred years of widespread automobile use it is to be expected that the US has accumulated much experience from which the rest of the world might learn.

As the number of vehicles in the US grew, so did the problems of traffic safety. This is reflected by the growth in the annual number of traffic deaths per year (Figure 1).

Responsibility for roads and traffic safety rests primarily with the 50 individual states, and not with the Federal Government (the government of the US). Roads are built by the states. Speed limits, belt-wearing laws, drunk-driving laws, and traffic laws in general are decided and enforced by state and local governments. However, it is not that simple.

In 1966, in response to the nation's annual traffic fatality toll exceeding 50,000 deaths, the US Congress created the *Department of Transportation* (DOT). This falls under the Executive Branch of the US

Government (there are three branches, the other two being the legislative branch and the judicial branch). DOT's head, the Secretary of Transportation, is now a cabinet-level position, reporting directly to the President of the United States.

The DOT created two agencies with responsibilities for safety, the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA). The heads (called Administrators) of these agencies (and a few of their senior subordinates) are appointed by the President, but must be approved by the US Congress. When a new President is elected these political appointees are likely to be changed. Indeed, they are almost certainly changed if the new President is from a different political party from the previous one.

Congress also passed the *Highway Safety Act of 1966* aimed at establishing a coordinated national highway safety program aimed at reducing the death toll on the nation's roads. The act authorized states to use federal funds to develop and strengthen their highway traffic safety programs in accordance with uniform standards promulgated by the Secretary of Transportation. The initial standards touched on many aspects of highway traffic safety, including driver education, driver licensing, vehicle registration, vehicle inspection, highway design and maintenance, and traffic control devices. NHTSA and FHWA jointly administered the standards, with NHTSA taking responsibility for the "driver and vehicle" standards and FHWA overseeing the "roadway" standards. NHTSA's role evolved more and more into regulating the vehicle through a series of Federal Motor Vehicle Standards, particularly FMVSS-208 which related to protecting occupants in frontal crashes. Its activities also included publicizing vehicle crash-test ratings and massive vehicle recalls to fix defects. McDonald [2007] reports that in 2004 NHTSA issued more than 30 million vehicle recall notices, about 1.7 recalls for every new vehicle sold.

Another national government body with a minor interest in road safety is the *National Transportation Safety Board* (NTSB), which is part of the legislative branch, reporting to the US Congress. Although its mandate covers essentially all transportation modes (road, rail, water, and air), its main responsibility is air safety. It investigates nearly all US air crashes as well as providing its unique high-level expertise to investigate some air crashes outside the US, even those not involving US aircraft or airlines. However, NTSB may choose to investigate particular very severe road traffic crashes, usually involving many deaths, and make recommendations based on its findings. NTSB's relationship with NHTSA can sometimes be adversarial.

Non-governmental agencies

There are many organizations involved in traffic safety that are not related to government. A few of these have major national impact.

The *National Safety Council* is a nonprofit, nongovernmental public service organization dedicated to protecting life and promoting health in the US. It is supported by members, including more than 51,000 businesses, labor organizations, schools, public agencies, private groups, and individuals. Since its founding in 1913 it has always included traffic safety as one of the most important of the many issues (such as work-place safety) with which it deals.

Mothers Against Drunk Driving (MADD) has prevented tens of thousands of deaths since its founding in 1980. It was started by a private citizen, Candy Lightner, after one of her 13-year-old twin daughters was struck and killed by a drunk driver. She harnessed her grief to form MADD, an organization aimed at preventing other parents from suffering a tragedy like hers. By attending trials and other activism, MADD heightened public concern about drunk driving, which in turn led to changes in legislation and even more importantly, in public attitudes towards drunk driving.

The Insurance Institute for Highway Safety (IIHS) conducts widely advertised crash tests that are often highly publicized by auto manufacturers whose products receive favorable ratings. It also conducts some of the best safety research performed in the US. Its activities are widespread and well known, but it is often not recognized that it represents the interests of the insurance industry. And the interests of the insurance industry are not necessarily the same as those of the public when it comes to traffic safety [Evans 2004, p.376].

There are many other organizations supported by other industries, including individual insurance companies. There are influential groups advocating positions favored by enormously powerful litigation interests.

NHTSA has central role. Notwithstanding the involvement of other governmental and non-governmental bodies, it is NHTSA that represents the bulk of federal involvement in road safety. It is central to regulating vehicle safety and encouraging states to adopt safety laws. It is even responsible for the implementation of vehicle fuel economy standards. Congress may pass laws that relate to safety, but it is NHTSA that has the task of making them happen.

NHTSA cannot order states to adopt policies. However, by threatening to withhold certain assigned funding, it can exercise enormous persuasion.

In 2000 the US Congress passed legislation providing financial incentives for states to make it illegal to drive with a Blood Alcohol

Concentration (BAC) greater than 0.08%. By 2005, for the first time, all states had the same legal limit [Insurance Institute for Highway Safety, 2010]. Prior to this, the legal limit varied from state to state and was generally higher than 0.08%. Indeed, the various states accepted the concept of chemical testing rather than subjective skill tests (walking a straight line, counting backwards, etc.) at different times, but in all cases many decades after the first law using measured BAC was introduced in Norway in 1936. The Norwegian law criminalized driving with a BAC greater than 0.05% [Glad 1987]. Although the nationwide US limit (in 2010) is the same 0.08% in all states, the laws, and language, relating to drunk driving still vary from state to state. The terminology DUI (driving under the influence) is used in some states, while others use DWI (driving while intoxicated).

While some degree of uniformity exists for drunk driving laws, the same is not so for belt wearing laws. One state, New Hampshire, has no law requiring belts to be worn. 30 states have primary belt laws in which a police officer can stop a vehicle if a person is observed not wearing a belt; 19 states have secondary belt laws in which a vehicle must be stopped for some other reason, such as speeding, before any of the occupants of the vehicle can be cited for not wearing belts. [Governors Highway Safety Association, 2010].

The federal government became involved in speed limits after the October 1973 Arab oil embargo. Such involvement was facilitated because the Interstate System is 90% financed by federal funds. The Interstate System is a network of limited-access highways (also called freeways or expressways) connecting major US cities. Its total length is over 75,000 km. It was authorized by the *Federal-Aid Highway Act* of 1956, motivated in part to contribute to national defense by making it easier to move military supplies and troop deployments to airports and seaports in the case of a national emergency. This leads to a major federal role in the Interstate System.

A nationwide speed limit of 55 miles per hour (89 km/h) became law throughout the US on 1 January 1974. (55 mph is exactly equal to 88.513370 km/h, which rounds to 89 km/h. In many publications it is incorrectly rounded to a lower value). Although this law was enacted to reduce fuel use, with safety not a motive, it in fact reduced traffic deaths by about 5%, a larger annual amount than any measure aimed specifically at safety [Transportation Research Board, 1984]. (Its effect on national fuel use was only about 1%).

The main impact of the nationwide 55 mph speed limit was on the Interstate System, because speed limits on other roads were rarely much higher than this, so that no change was involved. Prior to the law most states had imposed maximum speed limits of 70 mph (113 km/h) on their portions of the Interstate System, although some had 65 mph (105 km/h), some 70 mph (121 km/h), and two states had no maximum speed limit.

In 1995, Congress repealed all federal involvement in imposing speed limits on the states. 25 states returned to their limits prior to the nationwide maximum speed limit, 17 states adopted lower limits than previously, and 8 states ended up with higher speed limits [Wikipedia, 2010]. Many studies showed that this increased fatalities [Insurance Institute for Highway Safety, 2003].

Data collection

NHTSA is responsible for collecting US crash data through its *National Center for Statistics and Analysis* [NCSA, 2010]. The NHTSA data sets are not only a precious resource for the US, but for the whole world. The technical literature contains dozens of studies by researchers from many countries that use US national data sets. This is in part because the US, with so much more history, and with so many more vehicles than other countries, provides large sample sizes of data. It is also because the data are considered highly reliable and are readily accessible in transparent formats to everyone on the web at no cost.

The Fatality Analysis Reporting System (FARS)

Prior to the 1970s the only estimates of annual traffic deaths were available from the National Safety Council, which published estimates of annual fatalities from the beginning of the 20th century [National Safety Council, 2009]. These were based on reports from the individual states. However, few details beyond the totals were available, so that little analysis on the nature of fatal crashes could be conducted.

In the early 1970's NHTSA began formulating what was later introduced as the *Fatal Accident Reporting System*, with the acronym FARS becoming familiar to safety professionals. FARS aimed to document details of all US fatal crashes in a uniform format in computer files.

In February 1998 FARS was renamed the *Fatality Analysis Reporting System*, thus retaining the already very familiar acronym FARS. The reason for renaming the data set was to avoid the word *accident.*

There are compelling reasons why the word *accident* should never be used in professional, or even popular, discussions of safety [Evans 2004, p6; Pless and Davis, 2001]. *Accident* conveys a sense that the losses are due exclusively to fate. Perhaps this is what gives *accident* its most potent appeal – the sense that it exonerates participants from responsibility. *Accident* also conveys a sense that losses are devoid of predictability. Yet the purpose of studying safety is to examine factors that influence the likelihood of occurrence and the resulting harm from crashes. Some crashes are purposeful acts for which the term *accident* would be entirely inappropriate. At least a few percent (perhaps as much as 5%) of driver fatalities are suicides [Ohberg et al. 1997; Hernetkoski and Keskinen, 1998]. Here, and in much of the writing on safety, the word *crash* is used to describe the event of a vehicle crashing into another vehicle, person or object.

A fatal crash is one in which any person is killed. So fatal crashes have the most clear-cut definition. Injury crashes require some definition for inclusion, because injury is a continuous variable, from minor scratches to quadriplegia and worse. Likewise property damage varies from a small dent to almost limitless damage to vehicles and other property. So any data for injury or property damage must involve a measure of the level of harm. Fatal crashes have no comparable problem. If nobody is killed the crash is not included, if someone is killed it is. Such simplicity could generate a false impression that it is easy to define a fatal crash. The precise definition for inclusion in FARS shows that the situation quite complicated.

A crash is included in FARS if it occurs on a US public road, involves a vehicle with an engine, and any participant in the crash dies within 30 days of the crash as a result of the crash.

The 30-day inclusion criterion is by no means universal. Many other intervals are used. For example, the National Safety Council [2009] uses one year [National Safety Council, [2009]. Their estimate of total US traffic fatalities typically exceeds the FARS total by about 4%, suggesting that a similar percent of crash victims die between one and 12 months after their crashes.

Deaths that occur when bicycles crash into bicycles, bicycles hit pedestrians, bicyclists are killed when they fall off their bicycles, etc. are not included in FARS because a vehicle with an engine must be involved for the crash to be included. Likewise crashes on farms or other private property are not included because they do not occur on US public roads. If a frail elderly person sustains a minor injury in a crash, is taken to hospital, and dies from phenomena a week later, this death is not a traffic fatality. If a driver has a fatal heart attack followed by an out-of-control crash, this is not a traffic death. However, if the heart attack is not fatal, and the crash injuries are the cause of death, then it is a traffic fatality. It should be remarked that we are all mortal so that everyone has some probability of dying within the next 30 days. If we are, in the meantime, involved in a traffic crash, this does not make us a traffic fatality. These comments show that defining a traffic fatality in some rare cases is not as simple as it might first appear. However, nearly all FARS data are free from such uncertainties.

The data for FARS originate mainly from forms initiated by police officers investigating the crash, but later are augmented by other information. One form provides data about the crash (time of occurrence, number of vehicles, type of road, posted speed limit, etc). Another set of forms, one for each vehicle involved, provides data about the vehicles (make, model, year, license number). Another set of forms provides data for each crash participant – one fatal crash may involve many participants, such as all occupants of all vehicles involved, plus pedestrians. These forms provide such information as age and sex. Surviving drivers will be tested for alcohol. The BAC level of anyone killed in the crash is usually obtained in autopsies. In this way a crash level file, vehicle level file, and person level file are created – all tied together with a unique number associated with each crash. Questions of fault are not generally addressed, nor are there any useful estimates of the speed of vehicles prior to the crash, nor the crash severity. The focus is on objective information.

Each crash has more than 100 variables, though in many cases there are missing values. FARS data are available for every year since 1975. By 2010 the file documents details of more than 1.5 million people killed on the roads of the US, a dramatic reminder of the enormous magnitude of the problem of traffic safety.

Worked Example. Simple fatality counts can be extracted quickly from the FARS data on the web. However, on visiting the web for the first time it may not seem obvious how to proceed. I believe that after doing the simple example below, the reader will be able to extract relevant information on many questions of interest.

Suppose you want to know the number of people killed in 2005 while traveling in cars built by Toyota. Go to the main page of *The FARS Encyclopedia* at

http://www-fars.nhtsa.dot.gov/Main/index.aspx

Step 1. In the top row of tabs click "Query FARS Data"

You see a drop-down tab displaying the most recent year.

Select 2005 from the drop-down tab and click "Submit"

Step 2 You see a large number of choices in four columns.

"Crashes" – ignore

"Persons" – select "Injury Severity" and "Person type"

"Vehicles" select "Vehicle Make" (#8 from bottom of list)

"Drivers"– ignore

Click the tab "Submit" (near top of page).

Step 3 Four horizontal panels appear and should be treated as follows:

"State" – ignore (keeps default "All")

"Injury Severity" – select "(4) Fatal Injury, K. (This choice is required for nearly all FARS analyses.)

"Person Type – ignore (keeps default "All")

"Vehicle Make" – scroll down until "(49) Toyota", click, and with the Ctl key pressed scroll down further to "(59) Lexus" and click.

Now that all selections have been made, click "Cross Tab".

Step 4. In "Column" pull-down window that displays "State", select instead "Vehicle Make".

In "Row" pull-down window select "Person Type".

Clicking submit provides the required fatalities, namely 1,500 drivers of Toyotas, 96 drivers of Lexus cars (a luxury brand of Toyota), 632 passengers of Toyotas, etc. These and the other values are displayed for 2005 in Table 1. By repeating the process for the years 1999 through 2008, the totals for the decade (to be used later) are obtained.

Two Deficiencies in FARS. The original goal was that FARS should include all persons killed in crashes on US public roads. Yet somewhere along the way an exclusion was made for known suicides. This seems likely an attempt to lower the estimated number of fatalities. Most suicides are undetected as such. All that will be observed is, say, a high speed crash into a fixed object. To exclude the small subset that are accompanied by a suicide note compromises the integrity of the file and makes it difficult to conduct analyses of the role of suicides, an important factor. Ideally, another variable should have been added with values such as "suicide confirmed by note," "suicide suspected", and default "no evidence of suicide".

Any future fatality file should aim at including ALL people killed in traffic. It is the role of research to determine the factors surrounding the deaths that occur on roads, not the role of those creating the data sets.

When FARS was created computer storage was a concern, and people did not live as long as is occurring today. The oldest specific age that can be coded is 96 years. This is because only two decimal digits were assigned to age. The value 97 includes 97 years old and older, while 98 and 99 are needed for special purposes.

Any future data set should include ages well above 100. Ideally date of birth rather than age should be coded. Knowing age only to the nearest year prevents many studies, such as how risks vary over the first months of life, or whether risk is different on a driver's birthday.

US Safety Performance Examined Using Only US Data

Previously we noted how the number of traffic deaths per year had increased rapidly in response to rapid motorization, reached a peak, and later drifted downwards (Figure 1). Two common ways to characterize the safety are the number of deaths per thousand registered vehicles (Figure 2) and for the same distance of travel (per billion km of travel) (Figure 3). Figures 2 and 3 immediately suggest remarkable safety progress. Indeed, the rates shown in these figures have been the basis of many claims of successful US safety policy. Because there is a downward trend, in most years both rates reach new lows. Each new low has been heralded by press releases from NHTSA and other organizations as evidence that safety has improved from the previous year and reached new unprecedented levels, and that government policies are achieving impressive success. Such glowing interpretations miss some crucial facts.

First, the declines are to some extent the reflection of universal and to some degree natural processes. The slopes of the lines (on log scales) in Figures 2 and 3 are remarkably similar over very long expanses of time, each rate declining at about 3% per annum over the extended period. The declines are similar before and after major federal involvement in safety. Note the absence of any noticeable drop following the enactment of the *Highway Safety Act of 1966* and the plethora of safety standards that followed it. There is a large drop in the rates between 1973 and 1974, but that had nothing to do with specific safety legislation. It was the result of changes resulting from the October 1973 Arab Oil Embargo, including the imposition of a nationwide 55 mile per hour speed limit. This was introduced for the sole purpose of reducing fuel use. Likewise, the drops in 1980 and

2007 were due to major economic changes, not US government safety policy.

Supporters of US policy claim that data support their case. Vernick and Teret [2004], injury-control academics (with law degrees), write that the US "reduction in the risk of fatal motor vehicle crash is one of the major success stories of public health and injury prevention." They support this statement by noting a more than 70% decline in the deaths for the same distance of travel from 1966 to 2001, and attribute the "success" to vehicle regulation and litigation. They were unaware that a larger decline occurred in the first 35 years (1921-1956) for which data were available (Figure 3), and in which the vehicle regulations they claimed produced the declines were not present.

The large reductions after 2006 have likewise been used to claim success for safety policies, when they are in fact due to worldwide reductions in economic activity.

The most effective way to judge the safety performance of the US is not to examine US data such as is presented in Figures 2 and 3. Such data permit only comparisons between the US and itself. To get a picture of how effective US policy is we need to compare US fatalities to those in other countries.

US Safety Performance Compared to Other Countries

The simplest way to begin is to examine raw numbers of fatalities. Figure 4 shows how the number of deaths in the US changed after 1979 compared to changes in 3 comparison countries (Britain, Canada, and Australia). It was in the late 1970s/early 1980s that the safety policies of the US and other countries began to diverge. A similar graph is on page 382 of Evans [2004] for data through 2002. The stark difference between US performance and that in the other countries is captured in the chapter title "The dramatic failure of US safety policy" [Evans, 2004, p. 382-441].

The three comparison countries were chosen because they have so much in common with the US in terms of language, beliefs, and traditions. However, comparison with other countries shows a similar pattern of US failure (Figure 5).

By 2002 the US had fallen so far behind the three comparison countries (Figure 4) that this should have presented it with a perfect opportunity to catch up. What in fact happened is shown in Figure 6, which plots traffic fatalities relative to 2002. Rather than catching up on the 3 comparison countries, the US fell even further behind every one of the three. Also note that China's 2008 total is more than 30% below its 2002 total.

As mentioned when Figure 1 was first introduced, the number of fatalities in a country reaches a maximum value. Figure 7 shows how the number of fatalities in various countries evolved after reaching their maximum values. Different countries achieve their maximum in different years. For example, the US maximum of 54,589 occurred in 1972, the Australian maximum of 3,798 in 1970, and the British maximum of 7,985 in 1966. (The 9,169 road deaths Britain suffered in1940 in the midst of World War 2 are not included in this analysis).

This formalism allows us to include China. China reached its maximum number of fatalities of 109,381 in 2002, so there are only 7 points for the plot, which goes through 2008. Six years after reaching its maximum number of deaths, China had reduced its total by 33%. It was only in 2009, 37 years after reaching its maximum number, that the US achieved a greater reduction than 33%.

The number of deaths per thousand registered vehicles is shown in Figure 8 for a number of countries (compare with Figure 2). While the rate did indeed decline impressively for the US (Figure 2), it declines more steeply for the other countries. The rate of decline is particularly steep for China. The Chinese rate in 2008 is similar to that for the US in 1972.

The most reliable estimates for distance of travel come from Great Britain, which therefore provides the basis of comparison in Figure 9.

The 2008 British rate of 4.99 traffic deaths per billion km of travel is 36% below the US rate of 7.79. Prior to the late 1970s, the US rate was lower than the British rate, and lower than the rate for any country for which data were available.

Summary of Effects of US Safety Policies

Changes in fatalities between 1979 and 2008 are presented in Table 2 for the US and the three comparison countries (compare to p. 383 of Evans [2004] which gives changes between 1979 and 2002). While US fatalities declined by 27%, all the comparison countries had declines of more than 58%.

The number of traffic deaths that would have occurred in the US in 2008 if US fatalities had declined from 1979-2008 by the same percentages as in the comparison countries is shown in Table 3. If the US total had declined by 60.00%, as it did in Great Britain, then US fatalities in 2008 would have been 20,415 instead of the 37,261 that occurred. (All derivations are based on calculations including more decimal places than shown in tables). By matching the British decline, 16,846 fewer Americans would have been killed in 2008. The corresponding fatality reductions for matching Canadian and Australian performance are 16,599 and 15,909.

By failing to match the safety performance of the three comparison countries, this calculation estimates that an additional 16,451 people were killed on the roads of the US. Repeating this same calculation for every year 1979 through 2008 gives the result that failing to match the average performance of the comparison countries led to the deaths of an additional 314,000 Americans.

The corresponding calculations based on the vehicle registration and distance of travel rate, as carried out in detail in Evans [2004], provide similar, if somewhat larger, estimates.

By failing to match the safety performance of the comparison countries, the US is now killing about 16,000 additional Americans per year, or causing more than 300,000 additional American deaths over the 30-year period 1979-2008.

US Ranking in the World

Prior to the mid 1960s the US had the safest traffic in the world, whether measured by deaths per registered vehicle (Figure 2) or deaths for the same distance of travel (Figure 3). A series of tabulated rates for the US and 11 other major industrialized countries for the years up to 1978 appeared under the headline *U.S. the Safest Place for Driving*. [Motor Vehicle Manufacturers Association, 1982, p 52]. US rates were substantially lower than those in any of the other countries listed.

All the comparison countries (Figure 8) had higher rates than the US in 1979, but later achieved lower rates. Indeed, all countries for which we have data had larger values of deaths per registered vehicles in 1979 than the US.

It was noted in Evans [2004, p.381] that, in terms of deaths per registered vehicles, the US had dropped from first into 16th place. Analysis of data from the International Road Accident Database [2010] shows that the US is now in 20th place, behind Australia, Austria, Canada, Denmark, Finland, France, Germany, Great Britain, Iceland, Ireland, Italy, Japan, Luxemburg, the Netherlands, New Zealand, Norway, Spain, Sweden and Switzerland. This is based on comparing the US rate to the other country's rate for the most recent year for which data is provided, most commonly 2007.

In terms of fatalities for the same distance of travel, the US is in 13th place behind Australia, Canada, Denmark, Finland, France, Germany, Great Britain, Iceland, the Netherlands, Norway, Sweden, and Switzerland.

When US safety trends were examined without regard to other countries, there was little indication that US safety policies had much effect on safety. Meanwhile, much of the rest of the world was adopting more science-based policies that were reducing deaths. The catastrophic failure of US safety policy is that it paid too little attention to the factors that science showed to be of greatest importance and instead pursued policies that enriched litigators. The failed policies originated when a lawyer headed NHTSA [Evans 2005, p. 389-402]. Today, in 2010, a lawyer again heads NHTSA.

US Policy Continues on its Catastrophic Course

The central flaw in US safety policy is a near-obsessive focus on vehicles. This is encouraged by major US institutions, led by the US government and NHTSA. The US public is constantly misinformed that safety is mainly about vehicles, vehicle crash tests, vehicle safety recalls, vehicle safety equipment, etc.

The misinformation about the role of vehicles was dramatically illustrated by the high-profile coverage of problems with accelerator pedals on Toyota vehicles in early 2010. This issue generated massive national news. The Secretary of Transportation was widely quoted making the most alarmist statements revealing massive ignorance about traffic safety. Congressional hearings on 23 and 24 February 2010 were televised. Media coverage was such that just about everyone in the US knew about the issue. Comedians made jokes about Toyota's problems, confident that their television audiences would be thoroughly familiar with the subject. Such massive coverage is emblematic of the way Americans are constantly misinformed about what is important in safety.

It was in connection with this that the earlier exercise of computing how many occupants were killed in Toyota vehicles was performed. This is used in an editorial [Evans, 2010] containing "According to various reports, 19 deaths have been associated with Toyota's gas pedal problem over the past decade. But over the same decade, a total of 21,110 people have been killed in Toyota vehicles, with an additional 1,261 killed in Lexus cars. Almost none of these deaths had anything to do with technology, faulty or otherwise." These data in no way imply that Toyotas differ in safety from other vehicles – they reflect simply how many Toyotas are in the US vehicle fleet. They illustrate how the US gives so much attention to a few deaths if a vehicle manufacturer with vast resources can be blamed while ignoring the deaths of tens of thousands.

In air-travel safety, the US is a world leader. There the primary goal has always been to prevent crashes, not to reduce harm when crashes occurred, as has been the major focus of US ground-travel safety.

Figures 6 and 7 show impressive safety progress of China. Wang, Zhou and Yin [2009] describe how this was achieved. Their short article describes mainly policies aimed at driving and traffic control, and does not mention any of the vehicle factors that are at the heart of US safety policy.

Conclusions

The US has provided leadership in the collection of data, especially through its Fatality Analysis Reporting System (FARS). This is readily accessible and usable by all on the web, and provides a model from which other countries can learn much.

When it comes to traffic safety policy, the US presents a catastrophic failure that other countries should learn from so that they may avoid the same outcome.

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(Consulted 2010-07-02)

Table 1. The numbers of drivers and passengers killed in vehicles manufactured by Toyota. The tabulations are from the NHTSA FARS website. The purpose is to illustrate how easy it is to learn to quickly extract specific information from http://www-fars.nhtsa.dot.gov/Main/index.aspx. The reader should be able to reproduce these data (and any other similar) after following the instructions in the text. The data do not suggest that Toyota vehicles differ in safety from those of any other manufacturer. The results are used later in the text.

	Toyota			Lexus		
	drivers	passengers	unknown occupants	drivers	passengers	total
2008	1,418	534	8	87	55	2,102
2007	1,555	603	4	119	46	2,327
2006	1,580	639	4	130	50	2,403
2005	1,500	632	1	96	55	2,284
2004	1,517	622	3	89	43	2,274
2003	1,484	669	2	80	33	2,268
2002	1,472	674	3	70	41	2,260
2001	1,437	616	2	69	32	2,156
2000	1,423	654	0	51	34	2,162
1999	1,455	599	0	53	28	2,135
total for decade	14,841	6,242	27	844	417	22,371

Table 2. The percent reduction in the number of fatalities per year between 1979 and 2008 in the US and in three comparison countries.

country	fatalities		percent change 1979 to 2008
	1979	2008	
United States	51,093	37,261	-27.1%
Great Britain	6,352	2,538	-60.0%
Canada	5,863	2,371	-59.6%
Australia	3,508	1,466	-58.2%

Table 3. Estimated number of fatalities that would have occurred in the US in 2002 if the US had achieved the same percent decline in fatalities per year between 1979 and 2008 as the comparison countries.

if US decline had matched	instead of –27.1%, 1979-2002 change would have been	instead of 37,261, fatalities in 2008 would have been	number of US lives saved in 2008
Great Britain	-60.0%	20,415	16,846
Canada	-59.6%	20,662	16,599
Australia	-58.2%	21,352	15,909
		average	16,451

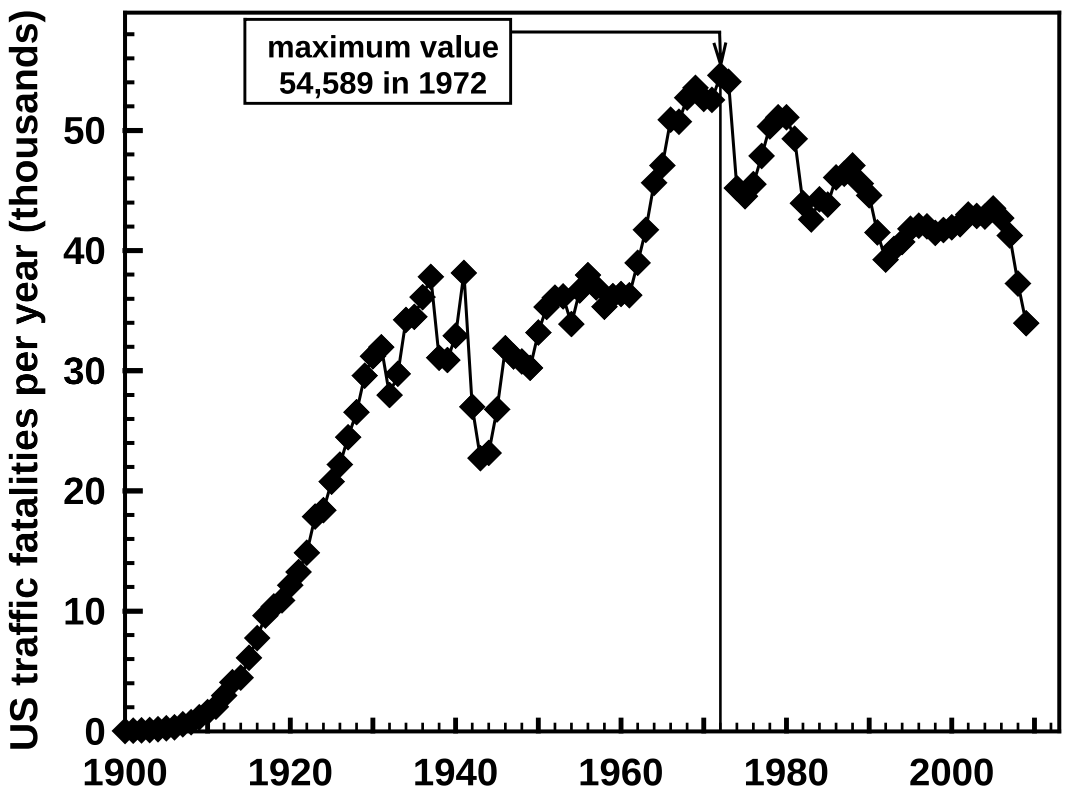

Figure 1. The total number of people killed on the roads of the United States from 1900 through 2009. The greatest number recorded was 54,589, which occurred in 1972.

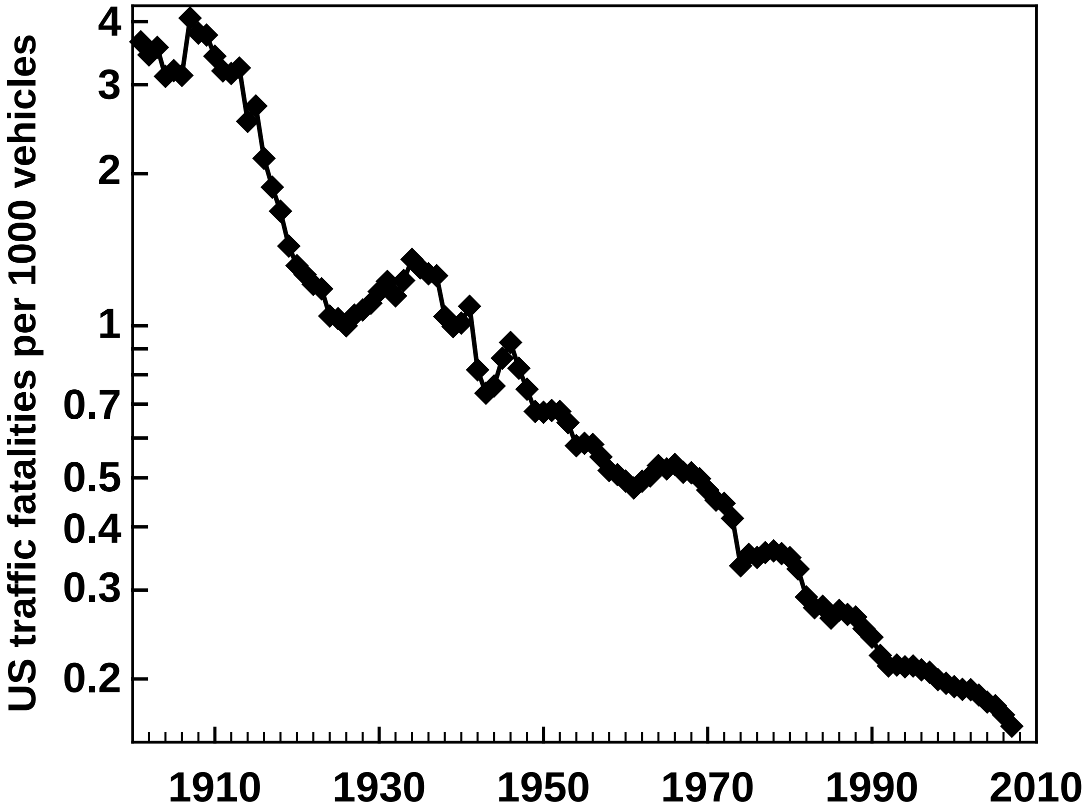

Figure 2. Number of traffic deaths per 100 registered vehicles in the US from1900 through 2008.

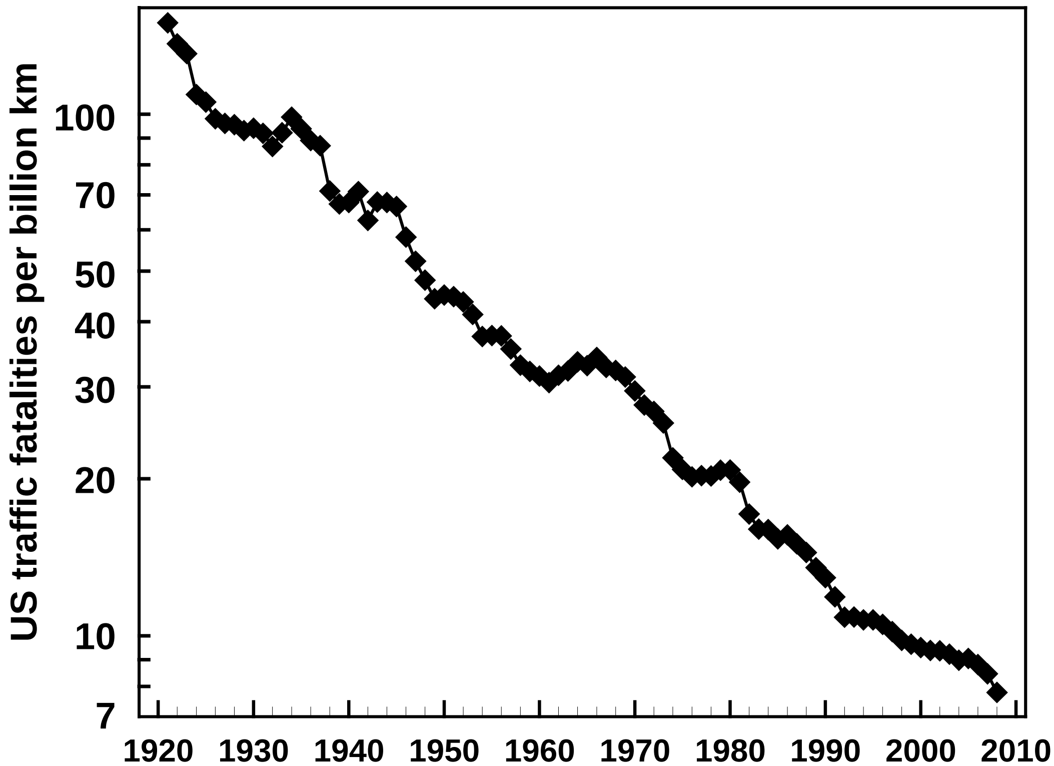

Figure 3. The number of US traffic deaths per billion km of travel for 1921 through 2008. The data are available only for 1921 and later because 1921 was the first year in which the US had in place procedures to estimate the distance traveled by all vehicles. This measure is not currently available for all countries.

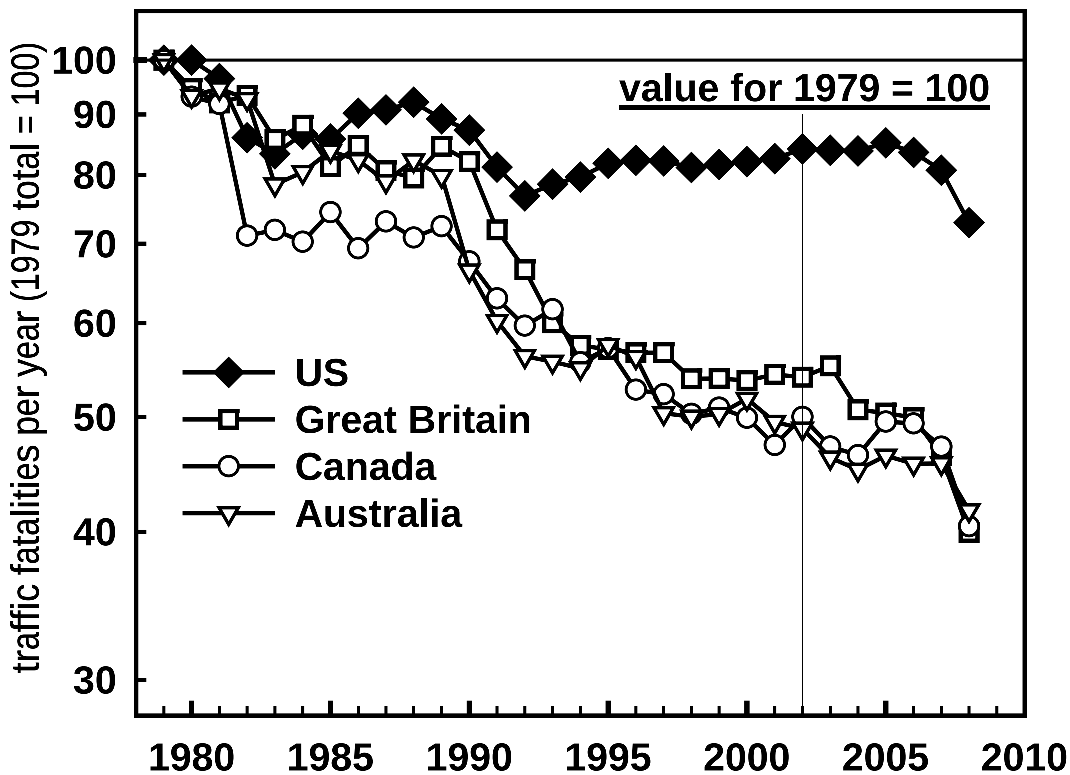

Figure 4. Traffic fatalities per year in the US and in three comparison countries. All values are rescaled by dividing the actual number for each year by the number in 1979, and multiplying by 100. Data for1979 through 2008. The line at 2002 denotes the comparison on p. 384 of Evans [2004].

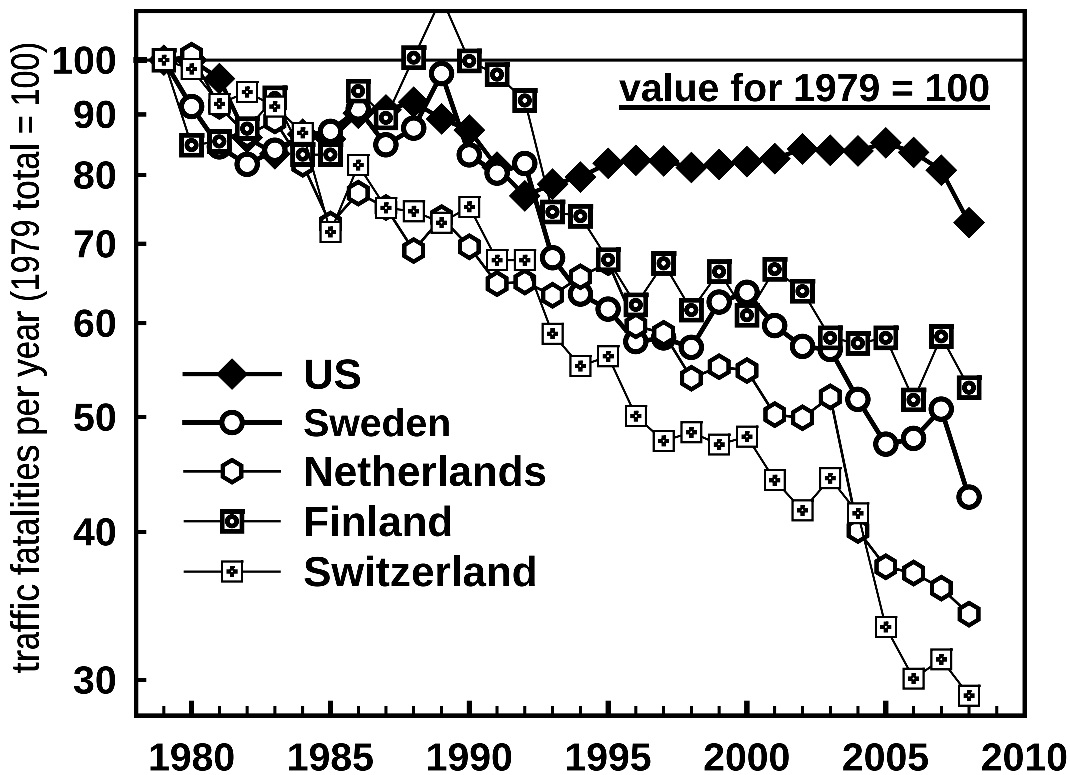

Figure 5. Traffic fatalities per year in the US and in four other countries. All values are rescaled by dividing the actual number for each year by the number in 1979, and multiplying by 100. Data for1979 through 2008.

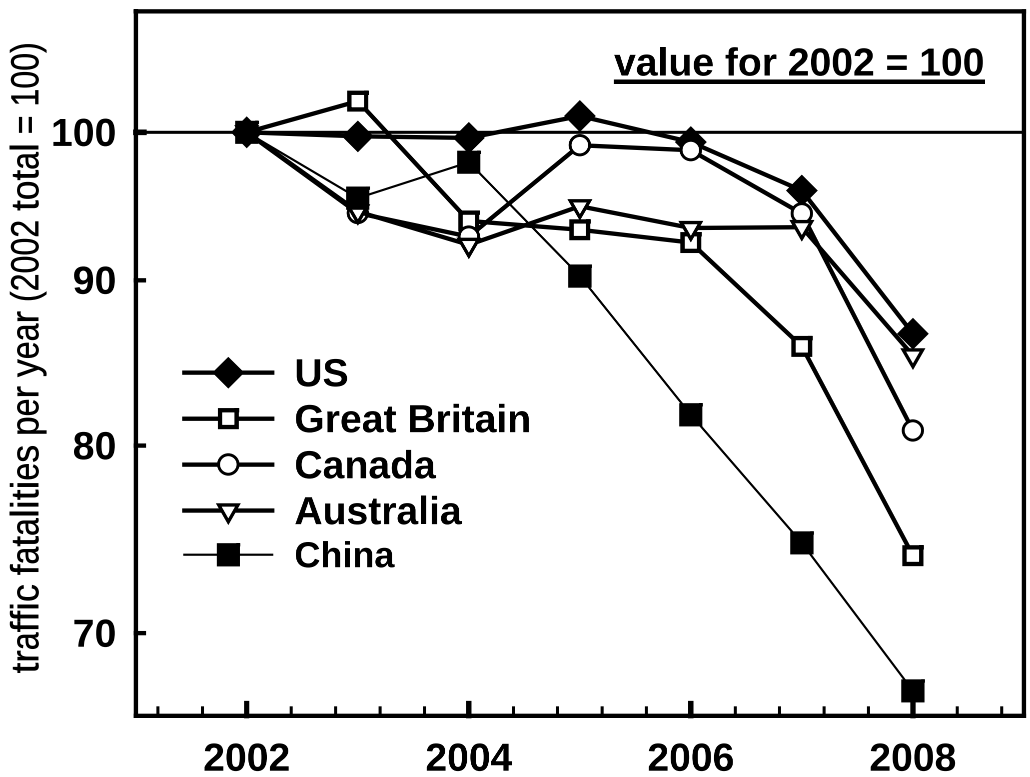

Figure 6. Traffic fatalities per year in the US and in three comparison countries. All values are rescaled by dividing the actual number for each year by the number in 2002, and multiplying by 100. Data for 2002 through 2008.

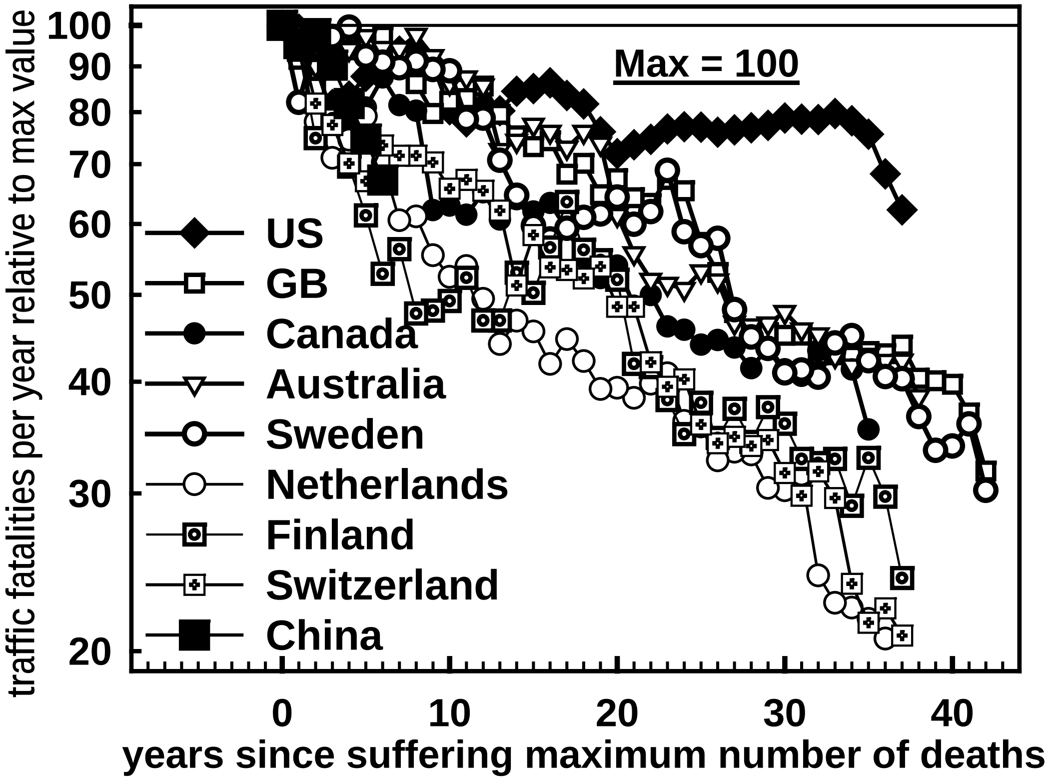

Figure 7. Traffic fatalities per year relative to the maximum number ever attained. All values are rescaled by dividing the actual number for each year by maximum number. For each country the data are through the most recent year for which data were available. For example, 7 years of data for China (2002 through 2008) and 37 for the US (1972 through 2009).

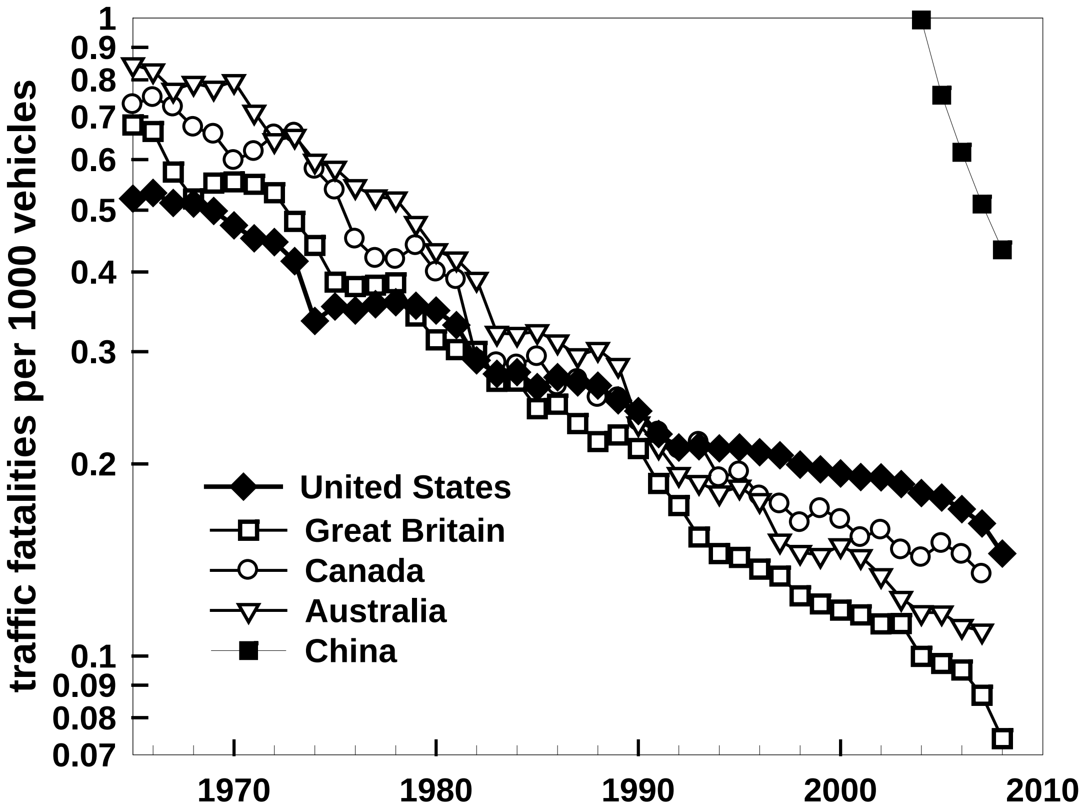

Figure 8. Traffic fatalities per thousand registered vehicles in the US, in China, and in the three comparison countries.

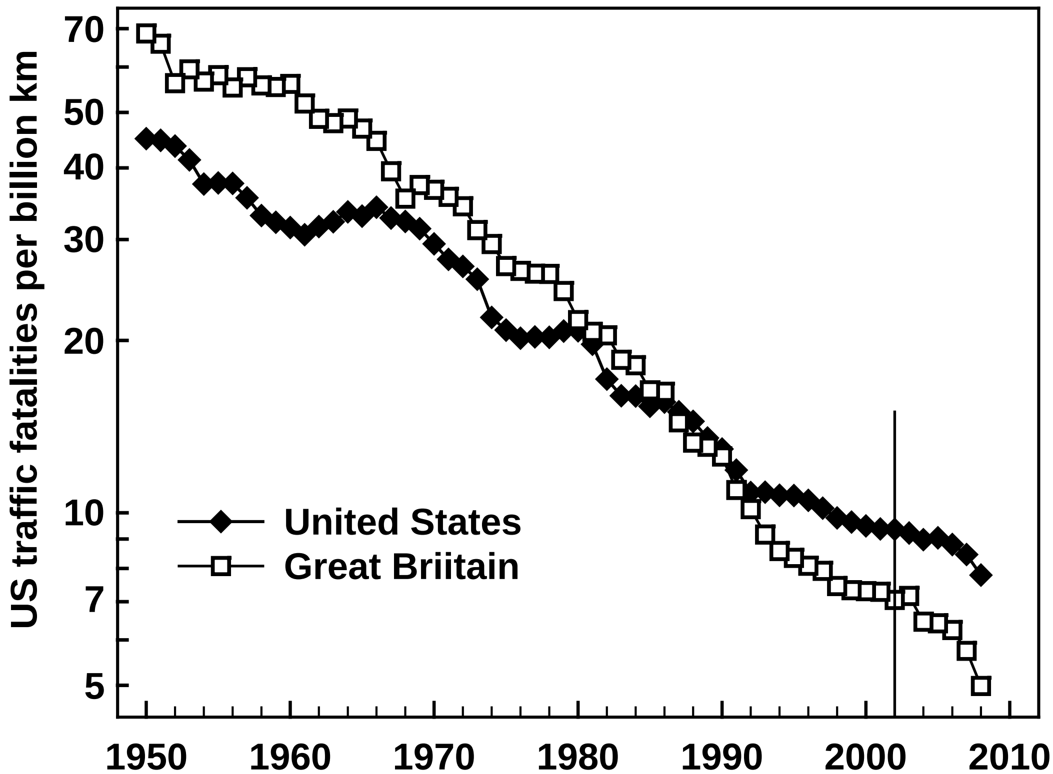

Figure 9. Traffic fatalities per billion km of vehicle travel in the United States and in Great Britain. The line at 2002 denotes the comparison on p. 386 of Evans [2004]. After that date the British rate declined far more than the US rate.

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