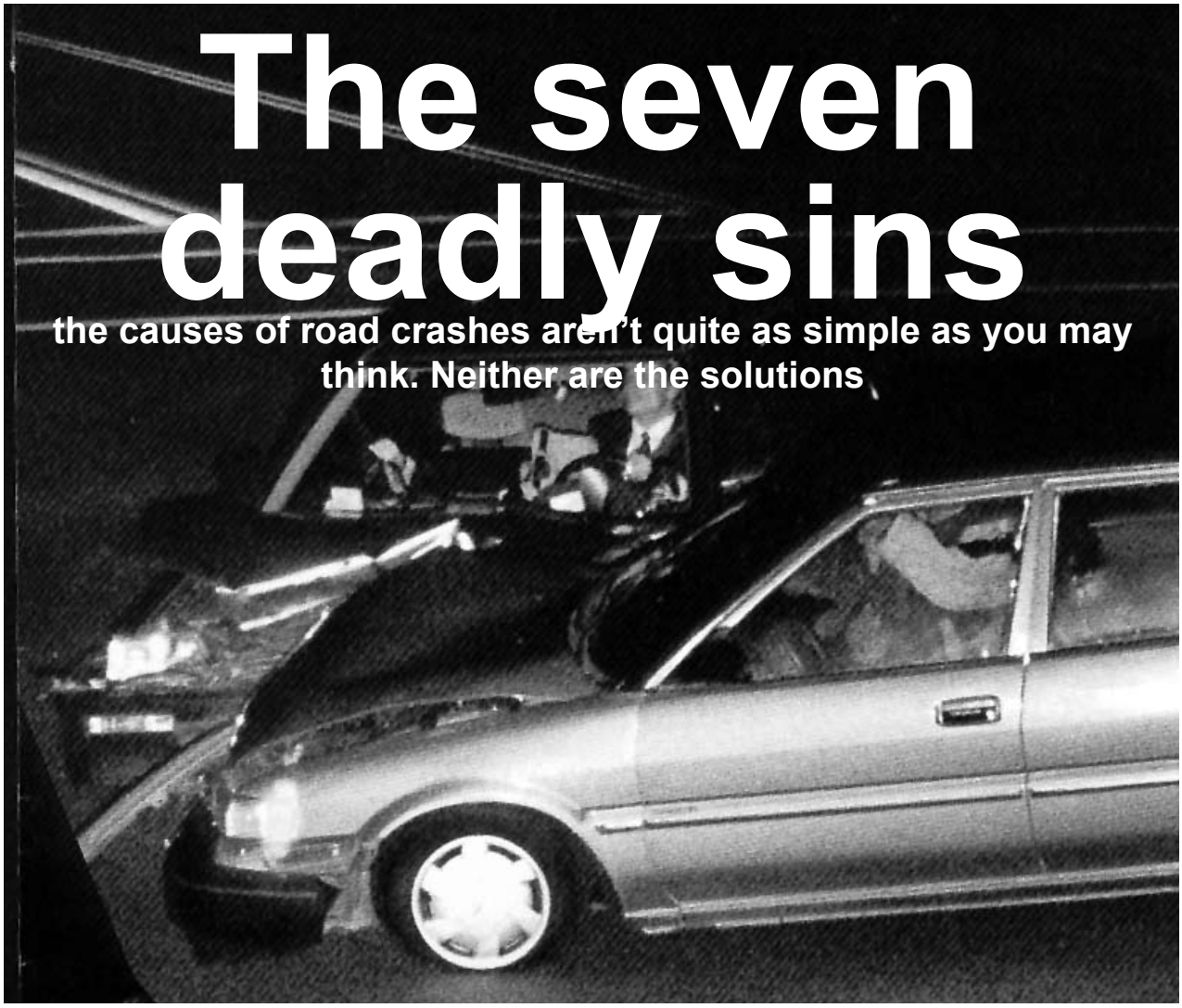
The seven deadly sins

the causes of road crashes aren't quite as simple as you may think. Neither are the solutions



Part One

A policeman's lot is not a happy one. He's often the ambulance at the bottom of cliff, the man who's given the job of making society's problems go away. Frontline policemen see a lot of pretty sad things – husbands who've just beaten their wives to death, the bloody aftermath of a gang brawl and the mangled remains of an innocent family hit by a drunk driver.

The end result is that policemen grow pretty hard and begin to see the world as clearly divided between those who obey the law and those who break the law. Having seen, first hand, the effects of high speed accidents, it's natural that they will target speed as a major cause of road deaths. However, life is never so black and white.

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The argument that speeding costs lives is both true and silly – the only way you can make a car safe is by parking it in the driveway and throwing away the keys. All moving vehicles are a risk to both the occupants and whomever they may collide with, regardless of the speed that is being travelled.

No speed is safe; it can only be appropriate to the circumstances. It's worth remembering that thousands of toddlers worldwide are killed every year by cars travelling at just a few kilometres per hour – on people's driveways.

Travelling at 20km/h is more than twice as dangerous as travelling at 10km/h. Travelling at 40km/h is more

than twice as dangerous as travelling at 20km/h – ultimately it's not the speed that is important but how appropriate the speed is to the road conditions. Cornering at 40km/h on a twisting, sloping, wet gravel road with cars coming in the opposite direction would probably be insane even though the speed itself might technically be legal.

The problem is not so much speeding as extreme behaviour – the people most likely to speed are young, inexperienced drivers in fast cars who tend to wildly exaggerate their ability. They are also quite likely to be affected by drink or drugs and quite likely to be tired, but not aware of it. Are these drivers a risk? Of course they are, and the police are right to target this group, although there is widespread evidence that simply chasing speeding drivers is a perfect way to ensure that a serious accident occurs a few seconds later.

Speed does kill

The people who argue that bad driving, not speeding, causes road deaths invariably believe that they're brilliant drivers and should therefore be exempt from road laws. They should note the case of Congressman Bill Janklow.

Congressman Janklow collected 12 speeding tickets during a 4-year period in the 1990s. More recently, he boasted to an audience about trying to drive 1,100 miles during a weekend to attend events in multiple states.

When Janklow got off with a warning instead of a ticket for speeding in June 2003, he thanked the "polite gentlemen who cut me a little bit of slack."

Two months later Janklow was charged with running a stop sign and killing a motorcyclist. Janklow reportedly told a state trooper he saw the sign but was going too fast to stop.

road deaths tend to involve:

1) very young drivers
2) very old drivers
3) very fast drivers
4) very impaired drivers
5) very tired drivers
6) very distracted drivers
7) very poor drivers.

Janklow was convicted of second-degree manslaughter on December 8, 2003 and sentenced on January 22 2004 to 100 days in jail. The 64-year-old Republican is a longtime friend of President George W. Bush and served only 30 days before being released into a daytime work programme.

The maximum penalty for the offence was 10 years in prison and fines of $11,400. Janklow was lucky, which is more than you can say about the poor bastard he hit.

There is no question that inappropriate speed is a serious problem and a major contributing factor to road deaths. However, working out and enforcing 'appropriate speed' is a lot more complicated than it sounds.

Any country's roads differ widely and yet all these roads have speed limits that were probably worked out in some government office a long way away. The exact speed limits tend to be an uneasy balance between conflicting public demands for action to ease road congestion and action to lower the road toll.

Although there is evidence that the road toll climbs along with higher average speeds, you have to be very careful not to assume that the average motorist's speed is therefore at fault. Average speeds are calculated by working out how fast the slowest drivers are going, how fast the fastest drivers are going, and coming up with a figure somewhere in between. Therefore, a higher average speed may be the result of everybody driving a little faster, or it may be the result of a few drivers going very much faster while the speed travelled by ordinary motorists stays much the same.

The police's basic argument – that every kilometre per hour that you drive over the speed limit means that both your reaction time and braking distance is substantially reduced– is a valid one, up to a point.

A sober, alert motorist in a well-maintained vehicle going 10km/h over

the speed limit on a long, straight, empty road with good visibility is not a particularly high accident risk, although if he or she does crash, the outcome is likely to be worse than if he or she were driving at the legal speed limit. The proof of this is in the facts: while it's dangerous to generalise, statistically the roads where people crash are generally not the long, straight ones with clear visibility.

However, speeding at 10km/h over the speed limit on a busy road outside a school where there are children crossing is highly likely to cause serious injury or death.

Now, if you were in charge of road safety enforcement, which type of activity would you target? Remember police resources are limited and policing of one area invariably means a lessening of policing in another.

There's a problem with the argument that the sober, alert motorist in a well-maintained vehicle going 10km/h over the speed limit on a long, straight, empty road with good visibility poses little threat to road safety: the businessman in his new BMW uses exactly this argument to justify going well over the speed limit. Where a driver is significantly over the speed limit, the policeman can't simply let him off on the grounds that he hasn't hit anything yet.

Every policeman gets sick of hearing the following argument, which generally goes something like: "My taxes pay your wages. I'm a law-abiding citizen. My car is capable of being safely driven at these speeds. Why don't you go and target bloody hoons in their old bombs instead of harassing law-abiding citizens like me."

The police might overlook minor infringements, but allowing cars to be driven well over the legal limit cannot be justified. Even if we accept the argument that the BMW owner and his car were driving safely, the cop can't simply let the BMW driver off and then say to the next speeding driver: "I'm sorry, we're going to have to give you a ticket because you were speeding and only businessmen in new BMWs are allowed to break the law." Driving very fast – even in a new BMW – is extreme behaviour, and extreme behaviour is behind most road deaths.

The next time someone tells you that in Germany there are no speed limits on the autobahn, tell him to check his facts. Yes, there are sections of the autobahn without speed limits, but the police can and will prosecute unsafe behaviour instantly, and that includes driving recklessly at speeds. Second, the sections of the autobahn without speed limits are relatively few. In the rest of the autobahn system and all the roads leading to it, there are strict speed limits and these limits are heavily enforced.

Going to extremes

There's seven deadly sins that lead to road deaths; if you get any combination of the seven deadly sins listed below, then the risk is far higher still.

Road deaths tend to involve:

1) very young drivers
2) very old drivers
3) very fast drivers
4) very impaired drivers
5) very tired drivers
6) very distracted drivers
7) very poor drivers.

By 'poor' we don't mean 'incompetent', we mean 'impoverished', although impoverished drivers are often also poorly trained and far more likely to crash due to ignorance and/or bravado.

Police and governments worldwide are trying very hard to bring the road toll down. Although there is a longterm strategy for improving the safety of both the cars & the roads themselves, the two main thrusts of police & government safety strategy tend to be education and enforcement.

The road to hell is paved with good intentions and the New Zealand government's 2003 road safety strategy was a case in point. First the government squandered millions on a largely ineffective education campaign. Then, in a single year, in a country of four million people, the New Zealand police issued around one million tickets, or the equivalent of one ticket to every four people, most of them to ordinary motorists in minor breaches of the road laws. And the road toll went up.

A similar campaign in New South Wales, Australia, is claimed to have lowered the road toll there, although we remain highly sceptical of many of the claims made about such campaigns (see our separate article *A Comedy of Errors*).

The New Zealand 2003 road safety strategy was essentially attempting to reduce extreme behaviour by targeting non-extreme motorists and was therefore doomed to failure from the outset.

Although extremes of slow or fast driving are both unacceptable on busy public roads, drivers are not always wrong when they drive a little above or below the posted speed limit.

As the Victoria Transport Policy Institute website puts it: "Drivers tend to maintain a speed that feels comfortable, based on the design (lane width, visibility, clearance) and use (traffic volumes, turning activity, pedestrian activity) of each stretch of roadway. As a result, simply reducing posted speed limits may do little to reduce actual traffic speeds. Effective speed reduction generally requires changing roadway design, or significantly increasing enforcement."

Here's how everyday driving works: once you have mastered the skills required to drive a motor vehicle, the conscious mind tends to switch off when you get behind the wheel. In other words, you go into autopilot mode, reacting instinctively to road

conditions. You don't consciously stop as you come up behind a stationary vehicle, you simply put your foot on the brake and clutch without even thinking about it.

Because driving is basically an instinctual activity, you don't make rational decisions every second as you drive along – you simply react to road conditions in a flowing manner as you go. Many people have experienced the sensation of arriving home in their car and suddenly realising that they have no recollection of the trip at all.

Human instincts have been refined through millions of years of successful evolution, and if a person is alert, sober, emotionally balanced and well grounded in the basics of road safety, then they can go through a whole lifetime and never have an accident. When they drive on a road they automatically adopt their driving to the environment and drive more or less appropriately.

Most people would agree on the need for sensible speed limits, and most people would also agree that there needs to be enforcement of speed limits – up to a point.

The police enforce the law in two basic ways: the first is non-specific intervention: if they notice illegal activity in the course of their ordinary patrolling, they will intervene to stop it.

The second is targeting. Certain groups of people, such as criminal gangs, are far more likely to commit serious offences than the average person. Rather than randomly patrolling, the police target criminal gangs through surveillance and the like. Few would argue with the logic behind this approach.

However, under the New Zealand government's 2003 road safety strategy the police decided to target non-extreme behaviour as a way of stopping extreme behaviour.

As America found out the hard way during the alcohol prohibition in the 1930s, law enforcement requires the cooperation of the citizens. if the majority of people don't believe in what the police are doing, then it is irrelevant whether or not the police are right or wrong

If a cop sits at the side of the road with a radar gun he can issue a hundred tickets an hour without achieving much more than clogging up the court system.

Why? Because targeting low-level offending on the assumption that it will reduce high-level offending is quite simply wrong.

Take the example of the harassed mum driving kids to school at slightly higher than the legal speed limit. Statistically, harassed mums driving kids to school at slightly higher than the legal speed limit make up a very low percentage of the road toll.

It's a fact that the police can find crime wherever they look, so the choice of where they look must be based on achieving the greatest good for the greatest number of people. Take the example of insurance fraud: statistically, a high percentage of insurance claims are fraudulent in some way, and yet the police rarely get involved unless the amount is large or the claim is blatantly criminal.

It's not that the police approve of insurance fraud, it's just that they have to choose between spreading limited police time on relatively low-level offending, like minor insurance fraud, or on high-level offending, like gang warfare and murder. They can't do both at once, and choosing one means they often can't focus effectively on the other.

The cold, hard fact is that road deaths tend to involve very young drivers, very old drivers, very fast drivers, very impaired drivers, very tired drivers, very distracted drivers and very poor drivers. Any enforcement campaign that doesn't target these groups is doomed from the outset.

Further, just because a person is driving slowly doesn't mean that he or she is driving safely. There are no shortage of motorists who may be driving within the speed limits but still be a threat to others. Take the example of the driver who doesn't look or indicate before changing lanes on a motorway, thereby causing other drivers to suddenly brake in order to avoid a collision. That, at the minor end of the scale, is exactly the type of extreme behaviour that leads to road accidents. It demonstrates either a lack of knowledge, awareness or care about safe driving, or a combination of all three. Such drivers deserve targeting.

Ditto drivers who sit in the outside lane at 20km/h below the speed limit and collect a trail of angry motorists behind them. Ditto yuppie four-

wheel driver owners who barge across three lanes of traffic knowing that the other motorists have little choice but to get the hell out of the way. Ditto truck drivers who sit two metres behind motorists driving at the legal speed limit. Ditto drivers who make pedestrians leap out of the way as they come up to intersections.

Modifying bad driving

As numerous studies have shown, once a person reaches adulthood, their patterns of behaviour are often quite firm, so trying to educate them out of bad habits is largely a waste of time. Three things that do modify bad behaviour are:

1) **Accidents or near–accidents**. The sudden shock of an accident or near-accident is often enough to give a driver a reality check that may or may not stay with them forever. Not everyone learns from accidents or near-accidents: the ones that don't are the ones who tend to live their lives in a haze of denial and unawareness. Nothing's their fault – it's always the other guy.

2) **Enforcement.** If the average driver gets caught drink driving and loses his licence, then he (or she) probably won't offend again, because the lesson has been learned. Enforcement works well with people who are responsible members of society, or where the enforcement is sufficiently effective to prevent further offending (e.g., seizing a speeding driver's car). Responsible members of society understand cause and effect and have fixed addresses and often jobs. They are good candidates for enforcement.

However, the people behind much of the road toll – substance abusers, especially substance abusers at the edge of the criminal community – do not easily perceive cause and effect. They simply get behind the wheel drunk, kill innocent people and wonder what happened.

Because they do not see the connection between cause & effect, the threat of punishment does not deter them from getting behind the wheel. Even after going to jail they often end up committing exactly the same offence again.

Further, a significant percentage of the road toll involves commercial vehicles and accidents within this group are highly likely to be fatigue-related. If the driver is also driving significantly beyond the speed limit, he is approaching one of those combinations of extreme behaviour that is often fatal. Add a ringing cellphone to the equation and you may well end up with a serious accident.

Conversely, if you can remove one of the high-risk factors from the equation you can remove much of its danger. In the case of commercial drivers the main factor is often fatigue.

Most commercial drivers are pretty decent people who would be horrified if they killed or hurt someone. They are also generally highly skilled drivers. However, given the economic pressure on them to drive long hours without a break, sooner or later an accident is highly likely.

The primary form of enforcement for this group should involve punishing drivers (and/or the company they work for) for spending too long on the road. This would greatly lessen the risk of them falling asleep at the wheel or making a serious mistake because of fatigue. Prosecuting a truck driver after he falls asleep at the wheel and kills someone is largely a pointless task – the people in the car he hit are probably already dead, and imprisoning the truck driver will not bring them back.

3) **The perception of enforcement.** Cars are a primary symbol of freedom, one of the only things in our lives that responds to our every whim – they accelerate when we put our foot down, they stop when we apply the brakes, they turn at our command. Balanced against the sense of effectiveness that our cars give us must be our need to fit in with the rest of the world. Most of us hover somewhere between a desire for limitless freedom on the road, our grounding in the basics of road safety and our fear of punishment if we do wrong.

Most people cheat a little – we see ourselves as responsible drivers but go through orange traffic lights or we drive a little over the speed limit. Within certain strict limits, this behaviour, while not desirable, is not always life-threatening, because road planners have learned to expect it. For example, there is a built-in delay between one traffic light turning red and the opposite light turning green so that late orange light runners can get through safely.

The average motorist tends to get away with it, at least most of the time. The problem, once more, is one of extremes: the person who is tired, distracted, drunk, emotionally unbalanced and/or has never been well grounded in the basics of road safety is likely to be the one who runs the red light and kills someone.

One major factor in modifying bad behaviour is the perception of enforcement. We know that if we get caught running through a red light we will get a ticket. Therefore we bend the law but don't often break it.

The same applies to speeding. It is well recognised within the road safety community that road planners should always set the open road speed limit at about 10km/h below what they see as the maximum safe speed for that road.

The reason: most people use the speed limit as a discretionary guideline and perceive that the police do not enforce speed limits unless they are significantly exceeding them. However, this is not necessarily a negative; our perception of enforcement – our belief that the police will act if we drive too fast – acts as an unconscious modifier of our behaviour. Without the police

having to do anything, we have adjusted our driving habits.

It is important to distinguish perception of enforcement from actual enforcement. If you park a police car at the side of the road, people will slow down. If you install a clearly visible speed camera on a stretch of road people will slow down. If the purpose of the exercise is to modify behaviour, it has succeeded admirably, even if the effect is temporary. There is a perception of enforcement, even though no enforcement may actually take place.

In the same way, police drink-driving checkpoints create a perception of enforcement that modifies the behaviour of many people, even if they never go through one. For example, a group of friends are sitting around having a few drinks after work and someone will discuss the police checkpoints and everyone starts getting nervous. Perhaps they'll stop drinking, perhaps they'll sneak home via the back roads, perhaps they'll call the wife to get a lift home.

Whatever their response, these friends are modifying their behaviour because of their perception that the police are likely to catch them. Therefore, regardless of where the actual checkpoint is, the people in our hypothetical group above are affected more or less uniformly and over a fairly long period of time. Also, and most importantly, the majority of people support the concept behind police checkpoints.

This is good law enforcement, because a few police officers can affect the behaviour of thousands or millions of people without actually ever meeting most of them or issuing a single ticket other than at the checkpoint itself.

On the other hand, if you simply hide a police car with a radar gun around a corner, the officers can issue a thousand tickets that are simply perceived as bad luck by the people who receive them. If they modify their behaviour at all it will only be very briefly. They don't see themselves as being offenders and can receive dozens of tickets without really changing the way they drive because the police car around the corner is seen as an annoying, random occurrence, like a flat tyre.

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As the New Zealand government soon discovered, you can issue tickets to one quarter of the total population and then see the road toll rise. A sustained campaign over several years might modify the behaviour of many motorists, but only if a significant percentage of those motorists actually supported the campaign in the first place.

Like it or not, ordinary motorists, while supporting the idea of speed laws, see them as a working principle rather than a fixed, inviolable rule. They simply aren't buying the assumption that mildly speeding on clear roads is likely to substantially increase their chances of dying young or causing harm to others. They see speeding tickets as a revenue-gathering exercise – just another tax on the motorist.

As America found out the hard way during the alcohol prohibition in the 1930s, law enforcement requires the cooperation of the citizens. If the majority of people don't believe in what the police are doing, then it is irrelevant whether or not the police are right or wrong.

For those that are unfamiliar with the Prohibition, here's a quick summary: in 1918 the Volstead Act made it illegal to produce or sell alcohol. The law was sneaked through after heavy lobbying by a curious coalition of fundamentalist Christian groups and eugenics campaigners. It never had the support of the majority of Americans. Although the law was hailed as a major step forward for America, it was actually a major step forward for organised crime.

Ordinary Americans saw no problems with having a few drinks, and because they couldn't buy alcohol legally they often bought it off criminals. Open warfare between gangs of illegal distillers led to huge regional crime empires that quickly

grew beyond the control of local law enforcement. By the time Prohibition was repealed in 1933, illegal liquor was being openly sold throughout America thanks to a police force that turned a blind eye if the bribes kept coming, and organised crime was firmly entrenched in American society.

In the New Zealand case, it appears that the police were at least partially wrong in a number of the assumptions behind their campaign – much of the New Zealand road safety strategy was based on a shonky report showing that the Victorian road toll dropped because of a combined approach of enforcement and education. The conclusions in this report have been utterly discredited by peer review.

However, using the shonky report as justification, millions were squandered on education campaigns that didn't work, and police commanders issued instructions to frontline staff to start issuing quotas of tickets. When you tell a cop to issue a certain number of tickets, then he or she will start looking for drivers to ticket, rather than ticketing those drivers whose behaviour is sufficiently extreme to warrant attention.

You're probably wondering what the New Zealand police weren't doing while they issued tickets to (in theory) one in four people out of the population. Well, they certainly weren't investigating certain types of road crime. If you were in Auckland, the largest city, and a driver drove straight through a red light, sideswiped your car and roared off, then the chances are he'd get away with it.

If the police actually witnessed the accident, then they'd unquestionably act, but if you simply noted the offender's number plate and complained to the police, then, providing no injury was involved, you'd get a letter back saying that the police were too busy to investigate and that you should try suing the offender through the Disputes Tribunal.

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Too busy to investigate high risk driving behaviour? Too busy doing what?

Public opinion surveys showing widespread public support for increased enforcement of road safety laws are both right and wrong: firstly, everybody thinks that they are good drivers, and therefore the cops should be prosecuting someone else, and second, the public, by and large, wants enforcement of laws governing extreme driving. Simple logic, backed by most credible road safety research, says that the police should target high-risk behaviour in high risk areas.

Sticking a hidden speed camera at the end of an empty stretch of open road that is largely free of traffic may result in a lot of speeding tickets, but it is unlikely to be as effective, or as widely supported, as putting the same camera very visibly outside a school or old folk's home.

Please note that we are not saying that it's okay to break the law by speeding. We are saying that it's a stupid waste of police resources to target low-level offending in order to stop high-level offending. It's like trying to stop bank robberies by targeting shoplifters.

The police should target speeding drivers who are a clear and present danger. The remainder of mildly speeding drivers should get warnings, with fines for flagrant offending. That's achievable and would receive widespread community support. The current system is almost universally despised, even though the majority of people support the principles behind it.

Road deaths tend to involve very young drivers, very old drivers, very fast drivers, very impaired drivers, very tired drivers, very distracted drivers and very poor drivers. Targeting the great majority of motorists is unhelpful because it waters down limited police resources and alienates the very people whose support is needed to lower the road toll •

Part Two

Road accidents are rarely a simple matter; they are a combination of factors that come together at the same time.

For as long as cars have existed, people have made mistakes while driving them. Anger, recklessness, distraction and fatigue are as old as humanity itself, and we carried those ancient faults with us into the age of the car. With the right driver training and law enforcement, we can minimise the effects of these faults, but we can't make them go away. Human error is as inevitable as the rain. You can't stop it; you can only allow for it in your planning.

The idea that 'the nut behind the wheel' is the cause of road deaths is essentially a myth invented by the motor industry. 'The nut behind the wheel' myth is not new. When a road safety researcher went to see Sir Alec Issigonis, the designer of the original Mini, a furious argument ensued. The researcher pointed out that in hundreds of cases, people were being killed or injured in Minis because the seats were being thrown forward in accidents and the doors, which had simple cupboard-style catches, were flying open, allowing people to fall out. Sir Alec would not accept that his car was at fault. As far as he was concerned, he said, he made a car that handled well and had good brakes, therefore any accidents, and deaths, were the fault of the stupid driver.

Lady Di was not killed by careless driving – she was killed by careless road design. If the pillar that her car hit had had a proper guardrail around it, her car would have simply bounced off and she would likely have survived with a few bumps and grazes. Instead, her car – which was travelling at around 80km/h at the moment of impact, according to road safety researchers we talked to – hit the pillar and disintegrated.

Lady Di was not killed by careless driving – she was killed by careless road design

The accident started with human error but the fatalities could have been avoided if the correct steps had been taken by road safety authorities.

However, as far as the more simplistic members of the road safety establishment are concerned, because an accident starts with human error, the cause of a fatality is human error. Their reasoning continues that if human error caused the accident, then we should increase the penalties for drivers who make mistakes.

As we can see from the Lady Di example, the basic assumption behind this reasoning is absurd. You may not be able to stop chauffeurs drinking and speeding, but you can design both cars and roads so that the consequences are not fatal.

Most international researchers agree that road accidents are caused by a combination of circumstances. For example, a drunk-driver speeding on bad roads in the wet has a high chance of having an accident. However, if the drunk driver's car has traction-control, antiskid braking and driver's airbag, there's a good chance an accident can be avoided and if it occurs, that death or serious injury can be prevented. Further, if you happen to be the poor sod hit by the drunk driver, whether or not you live is probably going to largely depend on the car you're driving.

There are five factors that raise or lower the road toll:

- The economic situation
- The driving environment
- Driving styles
- The roadworthiness of the vehicles

• The crashworthiness of the vehicles

The economic situation

The road toll tends to go up and down with the stock market, believe it or not. Dr Michael White from Transport South Australia has pointed out that while the overall trend is downwards, the highs and lows tend to correspond almost exactly with economic activity. As Dr White put it: "It is likely that relatively small changes in employment produce relatively large changes in the numbers of marginally employable young males on the road, with corresponding changes in crash numbers". It also seems highly probable that people simply take more risks during good times than during bad.

The driving environment

The roads on which a vehicle is driven can dramatically affect the number of accidents and degree of injury after an accident. For example, wet roads and gravel roads tend to be less safe than dry, sealed roads, because it is more difficult to control a vehicle. Further, on tight gravel roads, all vehicles tend to head towards the middle of the road, making accidents more likely.

Drivers often run into hard objects like lampposts and the ends of bridges. Cars also leave the road and roll into ditches or drift into the opposite lane and collide with oncoming traffic in the blink of an eye. Simple road design can soften major driving blunders into relatively minor scrapes. Removing hard objects from roads, putting some kind of crushable barrier around the objects that can't be removed or putting smooth barriers down both sides of a lane will stop cars colliding with oncoming traffic or falling off into a ditch.

It is this type of careful design that makes motorways comparatively safe places to drive, even though quite high speeds are reached.

Recent surveys showing that side-impact crashes make up an ever-growing percentage of the road toll are somewhat misleading. It's not that side-impacts are going up, it's that deaths and injuries caused by head-on collisions are coming down, partly due to improved road design and partly due to the lifesaving effects of airbags.

Drivers often run into things like lampposts and bridges. If you can remove things from roads that the drivers are likely to hit, you can lower the road toll

However, US studies have shown that growing sales of yuppie four-wheel drives have increased the risks to occupants of many vehicles struck in the side. In crashes between cars and other passenger vehicles during 2000-2001, almost 60% of the driver deaths in the cars struck on the driver side were hit by either offroaders or pickups — up from about 30% during 1980-81.

Driving styles

A person's driving style is the way he or she habitually uses his or her car. Does he or she speed? Drink and drive? Indicate before turning?

Bad driving style is undoubtedly a cause of accidents, but the finger of blame tends often to point towards groups that are only partly responsible. For example, 18-24 year old males, speeders and drink-drivers are especially likely to end up in accident statistics.

However, there are many factors that combine to cause accident deaths. For example, here's a typical open road fatal accident: An old lady is overtaken by a young male in a faster car. He collides with a woman driving in the opposite direction and kills her. He is seriously injured but survives. The news media has a field day as he's dragged into court and convicted for dangerous driving or manslaughter. The victim's family tearfully calls for the young man's blood. As far as many people are concerned, the young hoon caused the accident, and therefore should be locked up, preferably forever.

That's all very understandable, but it's not necessarily a true analysis of what actually occurred in our hypothetical accident. Let's take a second look.

The road was built in the 1950s and has been lightly modified over the years, but still can't cope with modern traffic.

It has few passing lanes. The old lady was a nervous driver, crawling along at 60km/h on the open road. She was not aware that a young, inexperienced and aggressive younger driver was directly behind her trying to get past. Eventually he swept past her in a rush of adrenaline, and the rest is history.

In terms of bad driving style, the old lady was at least as much at fault as the young driver. She was not at fault for driving slowly, she was at fault for driving slowly in a way that would inevitably force other drivers to overtake unnecessarily. Had she simply pulled over every few kilometres the accident might never have happened, yet the statistics record only one driver as having been at fault.

Another major factor in our hypothetical accident was the road. If the road had had frequent passing lanes the young driver might easily have passed safely.

If the law had insisted that all cars had to have their headlights on while driving on the open road, the old lady might have seen the cars behind her and been more inclined to pull over, the young man might have seen the oncoming car earlier, and the oncoming car might have seen the young man early enough to avoid a collision completely.

If the car that the victim was driving had not been a Honda City, then she might have survived the accident. If the government had adequately warned the dead driver of the City that her car was a death-trap, she might have been driving a safer car that day.

And yet, as far as the police and the news media are concerned, the young man was the cause of the accident. End of story. Yeah, right.

The roadworthiness of the vehicles

'Roadworthiness' means the ability of the vehicle to be safely driven on the road. In other words, regardless of the speed at which the vehicle is driven, the car must not wander over the road,

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the suspension must be able to take corners at highway speeds and be able to deal with potholes or sudden evasive manoeuvres. The brakes must slow the car down quickly and without skidding or pulling in one direction. The engine should be able to get the driver out of trouble, eg, in a hazardous overtaking situation. Roadworthiness may or may not have something to do with the age of the vehicle. American crash statistics deal with relatively new cars, yet people still career off the road and roll or hit trees, especially if they are in a yuppie four-wheel drive. Newer passenger cars tend to have superior roadworthiness compared to older passenger cars. However, although newer yuppie four-wheel drives handle better than old offroaders, they are still a significant risk to both their occupants and other motorists.

The crashworthiness of the vehicles

With any real-life crash research, you have to allow for the fact that certain types of people drive certain types of cars. For example, families generally prefer four-door cars to two-door cars because they carry passengers for much of the time. On the other hand, two-door cars and sports cars tend to be driven by males who are regular speeders and general risk takers. Fast cars that are driven by 18-24 year old males are especially likely to end up in accident statistics.

However, just because a person causes an accident, doesn't mean that he or she will be the one who dies. An important part of this equation is the construction of the vehicle, as we will explain below.

For example, sports cars tend to have more accidents because the owners drive them faster. However, when researchers compile lists of the drivers who have died or been injured driving vehicles under the category of 'sports cars' there are striking differences between models. Take the example of the Toyota MR2 versus the Nissan 300ZX.

On average, you can expect a sports car like the Toyota MR2 and the Nissan 300ZX to show around 146 deaths per 10,000 registered vehicle years.

In fact the Toyota is well below that, at 119 deaths per 10,000 registered vehicle years. By comparison, the Nissan, shows 223 deaths per 10,000 registered vehicle years.

These differences in results cannot be explained away by the age or driving

habits of the car's driver. For example, both the Toyota MR2 and the Nissan 300ZX are essentially street-legal racing cars attracting a very similar type of 'sporting' (risk-taking) driver. Further, they are in a similar weight class, although the Nissan is significantly heavier.

Therefore, crash theory would assume that the two vehicles would have similar outcomes in accidents, or that the Nissan, being somewhat heavier, would probably come out better. Such assumptions are proved false when the actual statistics for the vehicle are examined (source: Insurance Institute for Highway Safety, USA).

Why the difference? We put it down to two main factors:

1) The roadworthiness of the vehicles

2) The crashworthiness of the vehicles

'Crashworthiness' deals with the ability of the vehicle to protect the occupants once a crash has occurred.

Why does a Toyota MR2 show such marked superiority to the Nissan 300ZX in actual crash statistics? No one knows. Both vehicles attract similar types of drivers, so you can probably rule driver-skill out of the equation. There must be plenty of brilliant drivers and plenty of halfwits driving both types of vehicle. The answer is probably a combination of superior roadworthiness and crashworthiness. That's about all you can say.

However, if you were going out to buy a sports car today, and you had the choice of a Toyota MR2 or a Nissan 300ZX, which would you choose?

Yuppie four-wheel drives cause more than their share of accidents both because they are high, hard to handle and tend to have arrogant drivers. Where they hit a smaller vehicle they tend to come out best. However they are far more likely to have an accident

– especially the often-fatal rollover accident – and the occupants are less likely to be wearing seatbelts. It's actually a myth that large four-wheel drives are safer.

Education

Driving is largely an instinctual activity modified by training. When we are behind the wheel of a car, the part of the brain that makes reasoned decisions is only mildly active. Most road safety education, however, assumes that people respond to reasoned arguments or scare tactics.

There is ample evidence that one group highly likely to be involved in accidents – 18-24-year-old males – tend to see road safety campaign ads as a joke or a challenge.

Few people deliberately set out to kill themselves in cars. No one says: "I think I'll overtake this car in an unsafe manner and kill myself." Dangerous driving is often a combination of ignorance, inexperience and wrong attitude. The people who propose road safety campaigns are almost inevitably white, middle-aged, middle-class bureaucrats who have long since forgotten the drive for freedom and the thrill of danger that underlie most adolescent risk-taking activity.

Most road safety tv campaigns are laughably close to some kindergarten bible story. They show a scene where the naughty young men don't behave as their parents want and as a result are hurt, killed or arrested. Underlying this little parable is the message: "now, boys and girls, you be good and obey mummy and daddy, or this could happen to you." It's no accident that the ads don't work.

It's also no accident that 18-24-year-old males tend to end up dead more often – this is the time in a young male's life when he must carve a place for himself in the world. Risk-taking is an integral part of his process of breaking free from the influence of family, school and all the other trappings of childhood. It is the one time in a young person's life when parents' warnings tend to provoke further risk-taking activity rather than slowing it. When parents say "drive slowly and carefully" the teenager hears "we want you to behave like a whimpy child."

There is hardly a teenager in the world who has not experienced the thrill of laughing in the face of danger, and warnings from parents are generally a waste of time, or worse.

There is also a strong sexual element in male risk-taking activity. As many fathers of teenage daughters could tell you, young women are attracted to risk-takers.

A similar problem exists in anti-drink-driving campaigns. When the law says: "don't drink and drive" many people hear: "don't enjoy yourself and drive". As far as many people are concerned, drinking is enjoyment while being sober is boring. Among the hard core of substance abusers, education is largely wasted.

The police, by and large, have a much better idea. They simply block roads and arrest any driver who is over the limit. It doesn't change people's attitude towards drinking, but it does change their attitude towards getting caught.

Unlicensed drivers

The law tends to assume that anyone who commits an offence has sat down one day and made some reasoned, conscious decision to be a criminal. This assumption is clearly wrong in many cases.

A study funded by the American Insurance Institute for Highway Safety

showed that Mexican Americans reported heavier and more frequent drinking compared with Caucasians, a finding that's consistent with other research and follows a pattern among poorly educated ethnic minorities worldwide. Mexican Americans who had been arrested were also more likely to believe they could drive safely after drinking. They also reported more occasions when they had driven after drinking and more previous drink-driving violations.

However, the study findings indicate that heavy drinking, although common among some Mexican Americans, is only part of the problem. More than half of Mexican Americans and about a third of Caucasians indicated they didn't know the legal alcohol limit. Many also believed that they could safely drive at well over the legal limit.

Also in line with poorly educated ethnic minorities worldwide, cultural and language issues unquestionably affect the equation: the survey showed that Mexican Americans often had limited English proficiency, were younger, had fewer years of education, and earned less than their Caucasian counterparts, though most of the Mexican Americans were employed. Many didn't have driver's licenses, and half of the unlicensed drivers had never attempted to get one, quite possibly because they didn't know how.

Similarly, a survey of a group of young people who attended a work course in New Zealand's impoverished Northland showed that 92% of the people who drove to the course did not have driver's licences. Of those who did not have licences, around 20% could not sit the test because they were functionally illiterate. You can't just say these people are criminals.

It makes far better sense to teach road safety, including basic driving instruction, at school along with the other subjects necessary to cope in a modern world. It may be too late once the students leave school with bad attitudes.

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Seeing the light

One of the great objections to many road safety strategies is cost, yet there is one simple strategy which has been proven internationally to dramatically lower the road toll virtually without cost. How? By insisting that all cars have their headlights and/or driving lights on at all times. Studies of countries where this is law have shown a consistently lower road toll than countries where headlights are required only at night.

The reasons for the lower road toll are fairly obvious: many accidents occur because the other driver was not seen. In the rain, mist or low light conditions, lights help identify the presence of moving cars. They also tell you if the car ahead is coming towards you or moving away from you – something that is not always obvious, especially if the car is in your lane. However, there may be more subtle benefits to having headlights on at all times. Anecdotal evidence from drivers who regularly drive with their headlights on on the open road suggest that slower drivers tend to notice their presence more quickly and are more likely to pull over as a result. This could be an important factor in lowering the level of frustration of many drivers, which in turn is likely to lower the amount of unsafe overtaking as a result.

It is worth noting that the chief objection to this strategy – that drivers will constantly face flat batteries due to leaving headlights on – is easily overcome by the installation of a simple and cheap electrical device: a simple relay will turn the headlights on as soon as the engine has started and turn them off again when the engine is switched off. Such a relay is worth around $12 and can easily be installed in most cars in about 15 minutes. The relay does not stop the headlights being operated manually when the ignition is off.

On a few cars the headlight circuitry is too complicated to use a relay like the one described above, but bolt-on driving lights, which are cheaply and widely available from motor parts stores, can be installed without difficulty on almost all cars. These can be easily set up to work automatically in the manner described above.

The ironic thing about making the use of headlights compulsory at all times is that this regulation would actually lower the number of flat batteries caused by leaving headlights on (this is a common problem on wet days). This is because the vast majority of drivers would have some kind of automatic headlight control system fitted •