

Traffic Control: An Exercise in Self-Defeat*

By Kenneth Todd

Much of what has gone on in highway design and operation practice has represented activity without sufficient thought. *Congressional Highway Safety Report*, 1973.¹

The traffic control system in force today was put together in the early days of the automobile by public officials who knew little about regulating this new means of locomotion. Contemporary writings describe how traffic laws were adopted without prior research on the basis of personal opinion. "The fallacy has been to cram 'good medicine' down people's throat because the 'experts' thought it was good for them," wrote Judge Edward G. Fisher in his *Vehicle Traffic Law*.²

No underlying philosophy saw to it that traffic regulation met its purpose: safe and expeditious travel at an economical cost to the road user and taxpayer, with the least possible inconvenience to anyone, objectives that often call for a compromise. Into traffic regulations crept misconceptions, inconsistencies and contradictions — too many to describe all in this article — that have killed innumerable people, cause massive traffic jams, waste innumerable hours of time and vast quantities of fuel, pollute the air, and lead to unjust decisions in civil accident litigation. The system runs counter to basic legal, engineering and safety principles, and billions of dollars are being spent on high-tech computer equipment intended to overcome self-inflicted problems.

How it all began

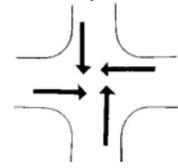
Early highway engineers borrowed heavily from railroad practice and could not anticipate the requirements of high-volume, high-speed motor vehicle traffic.¹

Before there were any traffic regulations, the relationship between all road users was governed by common law. The courts held that no one had a superior right; all had equal and mutual rights to be exercised so that no one interfered unreasonably with the rights of others.³ The supreme rule was the rule of mutual forbearance.⁴ Drivers had to be on the look-out for pedestrians and other traffic, and have their vehicles under control so that they could avoid a collision. All had to avoid causing unnecessary obstruction and use such care for their own safety as a reasonable person would under the circumstances.

A driver who was about to enter an intersection let anyone who was already in it get out first, just as it is common sense and common courtesy to let anyone get out of an elevator or phone booth before we get in. Thus, some courts began to rule in the mid-1880s, even before the automobile arrived on the scene, that anyone who first arrived or had entered the intersection had the right-of-way under common law.³ A common law "first-come, first-served" regime survives today in the all-way stop, a traffic control for which no US state has adopted a statutory right-of-way rule.

All this changed at the turn of the last century when a few municipalities began to issue ordinances that determined who had to give way to whom. But they did not investigate if that made traffic run better or worse than under common law. First, some cities gave northbound and southbound traffic priority over vehicles traveling east and west, while others gave eastbound and westbound vehicles priority over those going north and south.³ The rules proved unworkable, even if one took the precaution of carrying a compass.

Then, a rule adopted from France gave priority to drivers on the right.⁵ The rule is rarely in use today but still on the books of all US states. The rule paralyzed traffic when drivers entered an intersection from all directions and obstructed each other from leaving. The adoption of the rule shows that the lawmakers lacked the most elementary understanding of the intersection problem. Traffic runs with minimal control if a driver who wants to enter an intersection gives way to all those who are trying to leave — as it was done under common law — that is, to those on the left and to the left-turners from the opposite direction. Roundabouts, a modern version of the old traffic circle, work that way. But whether or not it is designed in the shape of a roundabout, an intersection can operate under the yield-to-the-left rule in countries where traffic drives on the right-hand side of the road.



Finally, the rule to give vehicles on major roads priority over those on minor roads was adopted in the 1920s throughout the United States.

Like the traffic signal, the stop (look-and-listen) sign and the synchronized signal system, the concept of the major road originated from the railroads. Like trains, vehicles were to travel without interference at elevated speeds. "Just as in railroad practice where trains on the main line are given a right-of-way over those entering... so has there been a tendency of late to designate certain important thorough-fares as 'Boulevard Stop Streets... and to give vehicles on them priority over all vehicles entering," a consultant who had introduced the practice in Chicago wrote in 1925.⁶ The concept found support from courts which ruled that the few drivers from a road of minor importance should not interfere with the many on crowded thoroughfares.³

Chaotic traffic conditions and congestion in American cities had followed the mass production of the automobile already in the late 1910s. Streetcars, bicycles, horse-drawn vehicles, pushcarts and pedestrians impeded the movement of the automobile. After setting a speed limit of 12, six and even four miles per hour at the beginning of the century,² the states and municipalities went the opposite way. They encouraged elevated speeds on main roads not only to get people faster to their destination but also in the mistaken belief that higher speeds relieved traffic congestion.⁷

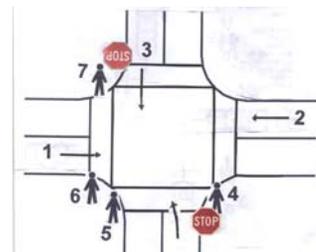
What makes intersections dangerous?

We must act to simplify driver decisions wherever we can.¹

No sooner had traffic on major roads got the right-of-way when side-street drivers and pedestrians found that they could not get across the large volumes of vehicles these roads were carrying. "Unless these through-traffic highways are equipped with block signals, it is dangerous to cross within a reasonable time and dangerous for pedestrians to cross at any time," said a report of the National Conference on Street and Highway Traffic in 1924.⁷

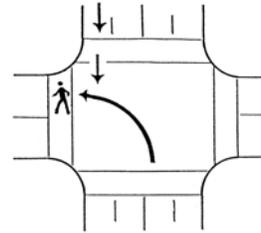
Safety concerns led to the "Basic Rule" in the *Uniform Vehicle Code* (UVC), which reads today: "...every person shall drive at a safe and appropriate speed when approaching and crossing an intersection...and when special hazards exist with respect to pedestrians or other traffic or by reason of weather or other highway conditions."⁸ Most state codes contain identical or similarly worded provisions that contradict the major road concept of moving traffic without interruption at elevated speeds.

The most frequent and most severe type of accident at a major/minor road intersection is the right-angle collision, generally blamed on the side-street driver's right-of-way violation. The major road makes motorists go fast without looking left or right, while the side-street drivers are given a highly complex task. They have to look left and right for pedestrians on two crosswalks, one on the near side and one on the far side, and also for



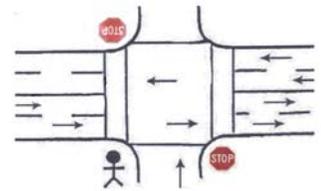
two vehicle streams, one from the left and one from the right. The left-turner has to deal with yet another traffic stream, the one from the opposite direction — seven conflicts in all. Safety advocates have long said that complex tasks should be avoided. They distract our attention from one conflict while we concentrate on another; road users should have to deal with only one conflict at a time.⁹

An accident risk arises whenever a vehicle gets obstructed from leaving an intersection. Consider the driver who is turning left when a pedestrian steps onto the far-side crosswalk. The driver stops for the pedestrian, as required by law, and now sits broadside across the path of vehicles from the opposite direction. Going fast in the belief that no one would get in their way, these drivers are forced to a sudden, unexpected stop. If an accident happens, the left-turner, get the blame, even though it was the law that created the dilemma.



To escape the dilemma, many a left-turner disregards the pedestrian's right-of-way and puts them at risk by failing to stop. At signalized intersections, where this problem is particularly severe, left-turns were found to be four times as hazardous to pedestrians as right turns.¹⁰

How do pedestrians get across a busy road? While side-street drivers must wait at the stop sign until it is safe to cross, the law gives the opposite instruction to the pedestrians. Their right-of-way on crosswalks encourages them to do what is forbidden to the side-street driver: get in the way of fast-moving traffic. Pedestrians who put their trust in the law are struck by drivers who are unprepared to stop, thinking that the major



road was meant to let them travel without interference. Many drivers are reluctant to stop for fear of getting rear-ended. Like the green light, marked crosswalks put pedestrians at risk by giving them a false sense of security.¹¹ Reliance on the law has been called the greatest traffic hazard of all.¹² The safer people feel, the less they look out for hazards, and the less road sense they develop.

The pedestrian's friend is the center refuge, which lets us cross in two stages. While crossing is safest in mid-block, where we can see cars coming from a distance, a pedestrian's life in mid-block has less value in the eyes of the law than on a crosswalk. Drivers who hit a pedestrian outside of a crosswalk may be sued for damages in a civil court, and innumerable court decisions have held that a pedestrian's negligence does not relieve the motorist of the duty to exercise reasonable care to avoid injury. However, as the pedestrian ranks as the violator in the police report for failing to yield, the driver is unlikely to face a penal charge unless there is evidence of some accompanying unlawful act, such as hit-and-run, speeding or drunken driving.

Except in self-defense, one may not kill or seriously injure someone who committed an illegal act. A householder who kills a burglar by the use of excessive force is liable to prosecution. Yet the law gives a pedestrian less protection than a criminal. One might have thought that the motorist, whose capacity to injure is greatest, should be held to a higher degree of care than the more vulnerable pedestrian, perhaps a handicapped person or a child. Normally, the rights of one person end when they infringe unreasonably on the rights of another. Statutes generally set penalties to reinforce common law obligations and discourage negligent acts. Right-of-way rules do the opposite. They diminish the main-street driver's responsibility and place an extra burden on those who want to cross. Every day people are killed or injured because the law encourages the motorist to defy the most elementary safety rules and travel at high speed on urban arterial roads and intersections without looking for other traffic. The more stringent is the division of responsibility between those who have priority and those who have to respect it, the less mutual forbearance and the more accidents we get.

A legal commentator wrote in 1931 that irresponsible traffic laws had eroded the pedestrians' rights and put them at the mercy of inattentive and reckless drivers, while the traffic engineers

neglected the needs of the pedestrian and did everything to favor the motorist.¹³ A year later, the Supreme Court of Mississippi complained that right-of-way streets had become race courses where motorists traveling on them thought they could disregard the rights of anyone who wished to cross.¹⁴

In Baltimore, an eight-year old boy stepped onto the crosswalk against the "Don't Walk" signal and got hit by a truck that started off as the light turned green for it. The court absolved the driver from responsibility, saying that the boy's age was irrelevant. "Under Maryland law, a pedestrian's conduct in crossing a street against a 'Don't Walk' signal in violation of statute is measured, for contributory negligence purposes, not by the usual standard of reasonableness, but by the standard set forth in the statute itself, and a violation of the statute constitutes negligence as a matter of law."¹⁵

By contrast, the Delaware Supreme Court said in a case involving two vehicles: "The signal to cross is not a command to go but a qualified permission, and the qualification is to proceed lawfully and carefully, as a prudent man would under the circumstances, which clearly requires looking to the right and left before entering the intersection. To hold otherwise... would be to relieve drivers from vigilance and careful driving at intersections, and license them to drive blindly where traffic is most dangerous."¹⁶

The courts have struggled in vain to resolve the contradiction between statutory right-of-way rules and common law responsibilities. Said a Utah judge: "This case is fraught with considerable difficulty, arising out of conflicting principles of law. The first is the familiar principle that one must exercise reasonable care for his safety. The other is that a person having a right-of-way... ought to be protected in the exercise of that right, and is not bound to anticipate an unlawful or negligent act on the part of another."¹⁷

To get people across a busy road, traffic signals were put up. At \$700 to \$3,000 per site, the traffic signal replaced the police officer on intersection duty, whose salary came to about \$2,000 per annum in the 1920s.¹⁸ The public has ever since had an unshakable faith in the protection of the traffic signal. But does it make traffic safer and more expeditious?

How traffic lights cause crashes

Hundreds of thousands have died because we lacked the will to save them.¹

Advertised as a panacea for all traffic ills in its early days, the traffic signal turned out to be one of those medicines that cures one disease and gives you another. It has been known since the late 1920s that signals reduce right-angle accidents at the cost of causing more rear-end and left-turn collisions.¹⁹ They first compress an hour's traffic into half an hour of green time and thereby halve all headways. They then make drivers go fast and keep close to the vehicle in front for fear of missing the green light, with their eyes up in the air rather than on the road. The combination of high speed, tailgating, diverted attention and sudden stops causes rear-end crashes. Yet every safety advocate insists on moderate speed and heightened attention at intersections. Following too closely is forbidden by law. The traffic signal encourages a violation of the law and of the most elementary safety rules. The pedestrian's faith in the traffic signal is equally misplaced. That signals did not improve pedestrian safety was known 70 years ago.²⁰ As many get run down walking with the green light as get run down walking against red.²¹

Traffic signal control is so unsafe that the official *Manual on Uniform Traffic Control Devices* already in 1935 recommended a 12-month trial of less restrictive alternatives.¹⁹ Today's *Manual* lists 12 alternatives to be considered in preference to signal control, among them all-way stops and roundabouts.²²

One might have thought that the authorities would focus not only on using less restrictive controls as alternatives to new traffic signal installations but also as replacement for existing ones.

Yet in the years 1998 to 2001, the states received \$1.13 billion in federal aid for traffic signal installations and improvements.²³ The Federal Highway Administration (FHWA), which claims safety to be its first priority, does what no other government agency would be allowed to do. If the airports operated a federal-aid air traffic control system so unsafe that the Federal Aviation Administration's guidelines advised against its use, there would be a public outcry, a spate of malpractice suit and a congressional investigation.

According to the FHWA, intersections controlled by all-way stops have the best safety record.²⁴ They have half as many accidents as those controlled by two-way stops or signals.²⁵ Serious accidents are extremely rare at all-way stops, a fact a court has attributed to the absence of a statutory right-of-way rule.²⁶ Yet the FHWA's *Manual* has called the stop sign a device that causes considerable inconvenience to motorists. Most drivers don't come to a full stop but treat the all-way stop as an all-way yield, which functions under the name of "filter-in-turn" in the Channel Islands. As the yield sign has a safety record as good as the stop sign but gives less delay and a 50 percent higher vehicle discharge,²⁷ replacing all-way stops with all-way yields would lower road user costs substantially.

Roundabouts are also safer than traffic signals, cause less delay and handle more traffic. They have cut accidents by half and serious-injury and fatal accidents by 60 to 90 percent worldwide.²⁸ Novel designs can raise roundabout capacity substantially without a need to widen the road in its entire length, as is commonly done under traffic signal control.²⁹ Like the all-way stop, the roundabout gets rid of the left-turn problem, the traffic engineer's biggest headache. As they are being constructed today in the USA, roundabouts are a step in the right direction but too large and too expensive when compared to the small and mini-roundabouts that are common overseas.

Replacing traffic signals with small roundabouts, all-way stops or all-way yields would avoid 300,000 injury crashes in the USA every year. Safer intersection management nationwide would prevent at least 40 percent of the 9,500 annual intersection-related fatalities

How traffic lights cause gridlock

Even when deficiencies are pointed out to local, state and federal officials, little or nothing is done.¹

Official reports have attributed 40 percent of the vehicle delays in urban areas to traffic signal inefficiencies.³⁰ We all have sat waiting at a red light when no cross traffic was using the green. But even if the needless delay were eliminated, signals severely reduce capacity, just when we need more of it in heavy traffic. Watch an intersection, however busy it may be, and you'll see that it often stays empty and nothing moves. The capacity loss is most severe at intersections that have left-turn arrows. The greater the proportion of left-turners, the lower is the vehicle-carrying capacity of a signalized intersection or freeway interchange. Remember that the left-turn problem — with its separate lanes and left-turn arrows — originated from the rule that gave the through-driver from the opposite direction the right-of-way and prevented the left-turner from leaving the intersection. Reverse the right-of-way and the problem is gone.

If the figure of 40 percent is correct, the annual nationwide loss comes to 5.7 billion vehicle-hours, or \$95 billion, plus \$28 billion for wasted fuel and other vehicle operating costs.³¹ These figures do not include the delay to pedestrians, the harm to business, the air pollution, the increased cost of living, and the cost of the accidents that the traffic signals provoke.

Whenever traffic signals break down, we are told to treat the intersection as an all-way stop. The day the signals went out in a Washington, D.C., suburb, a commuter reported that he got 25 minutes earlier to his job than usual.³² Incredible as it may sound, an FHWA study found all-way stops to cause less delay than those synchronized signal systems the public keeps clamoring for.³³ The experts

always extoll the wonders of synchronized traffic signals but forget to give us the bad news. Such systems function only with moderate traffic volumes and usually in one direction only. Those who travel in the opposite direction and on the side streets pay for it with longer delays.³⁴ But we do get faster to the next bottleneck, where we have to wait that much longer. Moreover, the faster traffic runs along an arterial street, the fewer vehicles the road network can carry and the sooner congestion sets in.³⁵

Who needs needless delay?

We cannot remain wedded to the past and embrace uniformity when there is just reason to suspect that certain practices may be uniformly bad.¹

The FHWA's *Manual* says a traffic control device should fulfill a need. Requests to the FHWA under the Freedom of Information Act have failed to find a need for the needless delay at a red light when we wait while no one is using the green.

Travel on the public highway is a fundamental right, subject to reasonable regulation. To restrict such right, the government must demonstrate a compelling interest. Restrictions must be justified by a real need, not by guesswork, speculation or scare tactics. Do the alleged benefits outweigh the loss of time and fuel, air pollution and risk of rear-end collisions? How do we know that drivers are competent to cross a road from a stop sign or flashing red signal but lose this competence as soon as the flashing signal is switched to regular operation? For the government to claim that motorists are incompetent to execute such a maneuver safely, even though they hold a driver's license — a certificate of competence issued by the government — is an insult to the public's intelligence. To obstruct the road is a nuisance and an offense. It does not become more palatable when the government is the culprit.

Nine states let pedestrians cross a street against red if they can do so safely and without interfering with vehicles.³⁶ An eight-year old in those states is presumed competent to cross a street against a red light. Are the 195 million licensed drivers nationwide less competent than an eight-year old in Michigan?

The traffic signal was originally put up to replace the police officer on intersection duty. A police officer has the power to stop people on the street for probable cause. If he stops someone without cause, he is abusing his powers of office. Is the needless delay at a red light on speculation that a driver will cause an accident an exercise of governmental power under color of law any less abusive than the action of a police officer who stops people on an unfounded suspicion that they are about to commit a crime?

Traffic signal installations should not only be avoided because federal guidelines advise it and because of the damage they causes, but because the courts have ruled that the government, to protect constitutional rights, must show that it uses the least restrictive means of furthering its goals.³⁷ A control device that causes traffic jams hardly qualifies as a least restrictive means of furthering the goals the government claims to pursue.

A system in disarray

New and better ways must be found to warn, guide and control the motorist and the pedestrian.¹

An FHWA publication lists four principal goals of urban traffic control: minimum stops, minimum delay, maximum capacity and maximum safety.³⁸ We have seen how the system defeats these goals. It causes needless stops and needless delays, reduces capacity and provokes accidents. Traffic control inefficiencies cost the US motoring public an estimated \$123 billion annually in lost time, wasted fuel and other vehicle operation costs. Billions more go to high-tech electronics to fight the symptoms of problems that public officials created in the early days of the automobile. The roots of the problem lie in the irreconcilable contradiction between the equal rights and responsibilities each individual has under common law and the unequal rights and responsibilities that the right-of-way rules dictate.

Traffic laws should forbid acts that cause danger, obstruction and nuisances — acts that the common law forbids already — but none other. A return to a system that conforms to common law principles will be the only way to give the public a safer, more efficient and more cost-effective service.

Luckily, there is light at the end of the tunnel vision. A wider use of roundabouts during the last few years is gradually making travel safer and more efficient. A shortage of funds is forcing municipalities to put up inexpensive all-way stops where citizens clamor for a \$120,000 set of traffic signals, although the all-way stop must be faulted for being too restrictive. And a brand new, age-old, zero-tech concept is in the offing. Experiments in the Netherlands have shown that running traffic at 30 kilometers (19 mph) per hour, eliminating traffic rules, signals and other controls in urban areas altogether, encouraging eye contact — and leaving road users to their own devices and to their common-law duties of reasonable care — has cut accidents, delay and congestion, and saved public funds.³⁹ Visitors are invited to close their eyes and walk about without having to fear for their lives. So successful were those trials that other European towns are copying them.⁴⁰

From the Foreword of the 1992 *Uniform Vehicle Code*

The proper purpose of all traffic legislation is not to impose unreasonable restrictions on highway traffic, but to insure, as far as this can be done by law and its application, that traffic shall move smoothly, expeditiously and safely; that no legitimate user of the highway, whether in a vehicle or on foot, shall be killed, injured or frustrated in such use by the improper behavior of others, Such is the purpose of the Uniform Vehicle Code.

The motto of the National Committee, “Salus, Libertas, Lex” — “Safety with Freedom through Law” — summarizes the philosophy of both the Uniform Vehicle Code and the Committee to provide every highway user, through law, a maximum degree of safety within the framework of traditional freedoms.

www.bikewalk.org/trafficcontrol_backtobasics.doc

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