Yellow Timing Research from
Camera Enforcement - A PICTURE OF FRAUD

Chapters Truth and Conclusion
by Greg Mauz

Allstate commercial: A car approaches an intersection, the light turns yellow... The spokesman says, "Will that light stay yellow for three seconds or six? Uncertainties on the road can lead to accidents."

There's the inadvertent truth from one of the IIHS's biggest monetary contributors. Inconsistent, usually too short yellow times are a major cause of red-light violations (70%) and a significant cause of RLV crashes.

The National Motorists Association (www.motorists.org), my book, Dick Armey and Matt Labash (Weekly Standard) have all documented the signal timing malpractice pervading the entire country. I discussed the numerous documented problems with the leader of the Institute for Transportation Engineers – the main group responsible for signal timing standards worldwide (July, 2001). He begrudgingly agreed with me on most points. Three years later, the ITE actually graded themselves a D. Biased engineers – grading their own job performance across America – could only judge themselves one notch above complete failure. Houston, we have a problem!

I read the ITE Traffic Engineering Handbooks from 1965 to this century regarding "determining traffic signal change intervals." My book comprehensively documents and explains this dangerous practice (call 325-896-2595 for a copy). The addition of ticket cameras create signalized intersections that are positively deadly.

ITE 1989 subsection, "Measure of Effectiveness (of Yellow Change Intervals)" states, "When the percentage of vehicles... which enter on red, exceeds that which is locally acceptable (many agencies use a value of 1 – 3%), the yellow interval should be lengthened until the percentage conforms to local standards."

Later in the report, Mr. Hulscher, an Australian, suggests a new enforcement technique to deter drivers who enter on red intentionally – cameras. This is the subtle set-up.

Here's the punch line. The same subsection in 1994 states, "When the percentage of vehicles that enter on a red indication exceeds that which is locally acceptable, the yellow change interval may be lengthened (or shortened) until the percentage conforms to local standards, or ENFORCEMENT (emphasis mine) can be used instead." Camera enforcement working 24/7 is inferred. Also, note the addition of the word "shortened" in regards to yellow timing.

Enforcement to correct engineering deficiencies? Since several ITE members, including Retting (IIHS), actively promote and profit from cameras, there certainly appears to be a conflict of interest here. An engineers job should not involve promoting enforcement. Engineers should properly engineer traffic controls to maximize safety and compliance.

ITE Journal (1989) reveals more language/procedure changes. "If it is the policy to provide clearance time, the traditional practice has been either to add the time to the yellow warning interval, or to use what has previously been called the 'all red interval', herein referred to as the red clearance interval. When clearance time is provided, it should be in the form of a red clearance interval (additional details are elsewhere in this proposed recommended practice)."

As revealed in the ITE Journals, there occurs substantially LESS yellow time than there used to be. Hence, a manufactured increase in the number of red-light violations began in the middle to late 1990's.

To spotlight the serious nature of the problem, here's a comparative example of past versus present yellow interval lengths, determined by the Kinematic Formula. Using a level intersection, 100 feet across with an approach speed of 35 MPH, the 1980's yellow time would be 5.05 seconds. The 1999 yellow time calculates to only 3.57 seconds. This equates to 1.48 seconds less yellow time than before, a reduction of 29.3%

Federal law 'requires' a minimum of 3.0 seconds of yellow and 'suggests' a maximum of 6 seconds. The absolute minimum should be 4.0 seconds, as three seconds is too short for perception/reaction time AND time to safely stop, forcing motorists to violate the red. Is it any wonder that camera promoters usually set up their photo enforcement machines at these unethically short yellow time intersections (New York, Fairfax, Beaverton, Mesa, Maryland, etc.)? It's simple: the closer yellow time is to six seconds, less accidents and much less violations result. Conversely, closer to three seconds greatly increases RLVs and crashes, but increases profits.

The following outline reviews the multitude of documented problems concerning traffic signals.

The Trouble With Traffic Signals
Documented Problems

- Unwarranted installations.
- Series of signals lacking synchronization.
- Flashers not being employed during slow hours.
- Inappropriately short green arrow durations followed by solid red-lights.

- All formulas (Kinematic, Rule of Thumb and Uniform Value) to determine signal change intervals contain the following limitations:
    - Too short duration for driver reaction – one second.
    - Dry weather conditions only.
    - Truck guidelines not available or established.
    - Minimum stopping distance times too aggressive.

- Using the posted speed limit as the approach speed fails to provide an accurate value for determining amber change intervals.
- Illegal approach speed value documented in Florida.
- Illegally short yellow timing documented in Virginia, Oregon, Maryland, etc.
- Driver disobedience purposely programmed into signals.
- Proposals to unethically shorten yellow times.
- All-red intervals stealing away yellow time for clearance.

As proven in this chapter, traffic signals do not even remotely resemble the "infallible devices" asserted by camera proponents. As outlined, there occur at least 15 distinct problems that can be associated with signals.

The majority of "red-light running" results from government malpractice, created by programming unethical and illegal traffic signal timing deficiencies, NOT "aggressive driver behavior." Furthermore, the overwhelming majority of RLVs occur less than 2 seconds into the red-light or during the all-red clearance intervals and are not dangerous actions threatening public safety.

Even proper engineering of traffic signals is not an exact science. Therefore, it remains hypocritical for local governments to micro-manage the actions of ordinary drivers who would need to outperform the honed reflexes of professional racecar drivers just to avoid violating an improperly timed light. But, to publicly demonize the pre-programmed failure of reasonable drivers and violate their rights by issuing camera-based citations while causing more crashes, injuries and fatalities is unconscionable.

The following traffic engineering studies demonstrate how engineering improvements seriously enhance safety and greatly reduce red-light violations.

♦AAA Foundation for Traffic Safety funded the re-engineering of 4 dangerous intersections in Detroit, Michigan. David Feber, Transportation Engineering Manager for AAA Michigan explains the simple low cost changes in the Progress Report article, "AAA Michigan Program Prevents Crashes, One Intersection at a Time." "For traffic lights, we go from 8" to 12" lenses so they're 50 percent larger. We re-stripe left turn lanes with pavement markings, re-time the traffic signals and add something called an all-red clearance interval, where you leave both sides red for a second or two while the signals are changing. Intersections also get better signs and improved pedestrian signals and parking that can block drivers' ability to see oncoming traffic is eliminated."

The results were called "astonishing". After 27 months, "crashes decreased by 47% with a 50% reduction in injuries." The approximate cost for these impressive safety improvements: a mere $35,000 per intersection. This is less than the cost of one ineffective camera.

The larger, more readily visible signal heads helped improve motorists acknowledgement of forthcoming traffic lights. The re-timing of the amber signal change intervals produced a 50% reduction in red-light violations! These results far exceed any positive RLV reductions allegedly produced by camera enforcement. Proper engineering produced a 47% reduction in crashes with 50% less injuries. RLVs diminished by 50%. Yet, there occurs even more good news as explained in the article. "The biggest savings is really from a societal perspective, from the reduced injuries," Feber says. "As the severity of an injury gets worse the insurance costs get less and the societal costs get higher." The estimated societal savings of the AAA seed projects is $100 million.

♦Police Lieutenant Terry Campbell relates a similar result observed in Omaha, Nebraska. An intersection on L Street incurred a high rate of accidents. Enforcement – the predominant response of most government officials – failed to reduce the incidence of traffic collisions. The Lieutenant

surprisingly suggested that city engineers investigate the problem. The traffic signals were re-timed and accidents declined to insignificant levels. Problem solved.

♦"Can We Make Red-Light Runners Stop? Red-Light Photo Enforcement in San Francisco, California," by Jack Fleck and Bridget Smith in Transportation Research Record 1693, TRB, admits that "experience shows that engineering solutions should be considered first." As mentioned earlier, the study could not honestly prove any crash reductions related to cameras, but allegedly, RLVs diminished by about 40%.

An intersection near San Francisco State University suffered a fatal crash in 1994. In the aftermath, the all too common scenario of emotion over objectivity ensued. Nobody bothered to blame or check for engineering problems at the intersection. The pervading mentality propagated is that it's always the crazy drivers fault and only enforcement can curb these maniacs and "save lives." This began San Francisco's unnecessary camera program.

After ticket cameras operated for many months, several intersections (including the University one) still showed little improvement in violations or potential for crashes. Finally, engineering improvements were implemented. The results are documented below.

Arizona Transportation Research Centers Document Review of TRR 1693 says, "After traffic engineers modified the signal progression, red-light running virtually stopped at this location. Preliminary data from other pilot intersections suggest that engineering solutions often reduce red-light violations significantly. Several pilot locations are undergoing engineering improvements such as increasing the yellow light interval..."

Even the Insurance Institute knows [but does NOT promote] that engineering improvements far exceed any supposed safety benefits from cameras. Two of their unadvertised programs handily beat the results of their own Oxnard study [-5% ALL crashes].

Many cities contain unnecessary traffic signals at low volume, safer intersections. These signals often cause more crashes.

♦"Crash Reductions Related to Traffic Signal Removal" (IIHS, 1996) states, "Recent crash analyses of signal removals at 199 low-volume intersections in Philadelphia reported an overall crash reduction of 24 percent." Other studies concur.

♦Along with local officials, the IIHS participated in a program that increased yellow times at 40 Long Island intersections. These "small changes" in the amount of yellow times at traffic signals produced –8% all crashes, -12% injury crashes and –37% pedestrian/bicycle crashes as compared to a similar number of control sites that lacked the yellow

increases. These decreases were recorded over the 36 month period after the signal timing changes. Surprisingly missing from this report is any mention of reduction in red-light violations that surely occurred. You see, more yellow timing not only trounces ticket cameras in safety, but in reducing RLVs as well.

♦Texas Transportation Institute (2005) studied accident records, over a three year period, at 181 intersection approaches in three Texas cities. The results mirror those of many other studies, including the AAA Detroit study. Adding one extra second of yellow time reduced crashes by –40%. In addition, red-light violations decreased by –53%. These improvements far exceed even the exaggerated results of the most biased red-light camera studies.

As evidenced in the aforementioned San Francisco study, when cameras go head to head against engineering improvements (mostly longer yellow times) the cameras lose big, not only safety wise but in reducing red-light violations as well. Even with the threat of expensive tickets and license points, cameras still lose.

♦San Diego, California usurped $300 fines, with a license point, from about 2,000 Americans a month at a poorly engineered intersection. This intersection was accident free for six years before cameras (see: Control Sites). Despite usurping $600,000 monthly from citizens, the violations stayed steady. After one second of yellow was added to the signals violations finally dropped to 900 or less. The city/county/state/camera company lost $330,000 per month.

♦Mesa, Arizona claimed a –22% drop in RLVs after installing ticket cameras. Still, camera citations were mailed to over 2,600 people monthly from 6 intersection's left turn arrow phases. The intersections contained very inadequate 3 second (federal minimum) yellow arrows. Yellows were increased to 4 seconds and violations dropped –73% to 716 the following month [Arizona Republic, February 6, 2001]. The city/camera vendor lost about $300,000 a month. Lockheed Martin – later sold to ACS – forced a renegotiation with Mesa to recover their financial loss. It's all about safety, right? The ticket camera program was suspended over money squabbles or lack thereof.

Camera proponents manufacture all sorts of misinformation to deter lengthening yellow times. The most common deception asserts that yellow improvements are only very temporary and drivers "learn" the longer yellows making even more future violations. As demonstrated in Mesa and San Diego, the real reason camera promoters hate increased yellow times is because MORE YELLOW EQUALS MUCH LESS MONEY. Despite the

fact that adding more yellow time greatly increases safety, camera company contracts often forbid the practice. In reality, those opposed to longer yellows or properly engineered signals and speed limits are actually ANTI-SAFETY.

The TRUTH is revealed through the speech, public statements, research, studies and actions of the pro-camera crowd. These biased, ticket camera salespeople have inadvertently, but clearly admitted that their product is a complete failure as a "safety" device. They admit the TRUTH that ticket cameras cause rear-end collisions, that there IS serious engineering malpractice at traffic signals and that added yellow time seriously defeats cameras in both safety and RLV reductions. Their own control sites show that DOING NOTHING is better than employing cameras.

Actions speak louder than words. As documented in New York, Los Angeles, San Diego, Mesa, etc., camera proponents clearly demonstrate that safety is, at best, an after thought. All of their actions involve schemes to usurp more MONEY, even at the cost of safety.

The guilty have admitted the TRUTH. Through a preponderance of self-implicating evidence, camera promoters have revealed that ticket cameras are a big fraud. If someone reads this chapter (TRUTH) alone, it contains more than enough evidence – beyond any reasonable doubt – to ban ticket cameras from U.S. streets forever.

IX. Conclusion

Every angle of analysis—Common Sense, Photos, Kinds of Crashes, Studies, Control Sites, Statistics and Truth—results in the same conclusions. Ticket cameras CAUSE more crashes, injuries, and fatalities. More than 500 people are dead as a result of camera programs in over 200 cities. Countless more people are suffering long-term injuries. Then, there's the cost in vehicle repairs and the ultimate cost to society in lives lost, billions of dollars, and further erosion of government trust.

The whole "red-light runner [violation] problem" is an illusion manufactured by people who profit from promoting camera enforcement. ITE Traffic Engineering Handbooks reveal that between 1989 and 1994 yellow times were shortened by about –30%, resulting in a corresponding large (40-70%) increase in RLVs, which were promptly blamed on "aggressive drivers". Camera companies to the rescue!

Unethically short yellows are required for ticket cameras to be economically viable, that is: to provide more than enough tickets (money) for all corporate/government interests to profit. Unfortunately, short yellows—in addition to causing a multitude of highly profitable citations—also cause a significant increase in RLV crashes and rear-end accidents (ITE).

Short yellows PLUS ticket cameras greatly exacerbates the aforementioned increase in crashes (especially rear-end collisions which rise about 70% or more). Enforcement by ticket cameras results in a double whammy AGAINST SAFETY.

The same deceptions and results also apply to speed limits. Many speed limits and yellow times remain so under posted that they are ILLEGAL, according to state and federal laws (Manual on Uniform Traffic Control Devices). And like short yellows, under posted speed limits CAUSE more crashes (FHwA) by increasing speed variance between vehicles, increasing tail-gating, and denying enough yellow time at traffic signals.

Returning safety improvements to our streets requires three basic things—removing ALL ticket cameras, properly engineering speed limits and traffic signal intersections, and employing live police enforcement against the few truly dangerous drivers who actually cause serious/fatal crashes.

There's no such thing as a "speeding problem", only speed limit problems. Over 90% of U.S. speed limits are posted too low (FHwA Speed Limit Survey—5 years, 27 states, 1992). Therefore, enforcement—whether traditional or by camera—is not the solution. The answer entails setting speed limits according to proper engineering standards.

The ITE/FDOT literature states, "For a speed limit to be effective, at least 85% of the drivers must voluntarily comply with the posted limit." To accomplish this, the speed limit must be posted at the 85th percentile speed—"the speed at, or below, which 85% of the observed free-flow vehicles are traveling."

An 85th percentile limit reflects the SAFEST and most DEMOCRATIC speed limit. That's why it's the law (MUTCD section 2B.11). "When a speed limit is to be posted, it should be the 85th percentile speed of free-flowing traffic, rounded up to the nearest 5 mph increment." If the government, police, and insurance funded "safety groups" truly cared about people and their safety, they would encourage the setting of properly engineered speed limits. Those opposing proper speed limits, in reality, oppose democracy, justice, real safety, and the law.

Reducing traffic signal related crashes is fairly simple. The best solution has been known for decades. Since the majority of the problem occurs from traffic engineering malpractice, then obviously engineering improvements are the answer.

Just removing the cameras will reduce collisions, injuries, and most importantly, fatalities. In addition, one second of yellow time—added to signals at violation and/or crash prone intersections—drops red-light violations from 40-75% and generally reduces crashes by 30-50% [see: chart and Truth]. Unlike ticket cameras, engineering improvements have never been known to cause more injuries and deaths. Almost every study shows "astonishing results" (Detroit quote). Just increasing the size (visibility) of the signal head decreased RLVs by -25% in Texas, which outscores RLTCs in Mesa and San Diego, despite big fines with points.

Location	Engineering Improvements	Results
Detroit	4 dangerous intersections: larger signals, improved markings, visibility improved, added more yellow time	-50% RLVs; -47% ALL; -50% injuries; societal savings +100 million dollars
San Francisco	Signal progression (University); more yellow time (several signals)	RLVs "virtually stopped"; RLVs "significantly reduced"
Omaha, NE	Signal retimed (L Street)	Accident problem solved

Philadelphia	Signal removals (199 intersections)	Crashes reduced -24%
Long Island	40 intersections retimed (added yellow time about +0.5 second)	RLV reductions NA; -8% ALL; -12% injuries; -37% cyclists/pedestrians
Texas	181 intersections; added 1.0 second yellows	-53% RLVs; -40% crashes

Location	**Ticket Cameras**	**Signal Timing Improvements**
San Francisco	RLTC at University--$271.00 fines/point--RLVs continue	Signal progression--RLVs "virtually stopped"
San Diego	RLTC at RLV prone intersection--$300 fines/point--still 2,000 RLVs (monthly)	1.0 second added yellow; -56% RLVs (<900/month)
Mesa, AZ	RLTCs at 6 intersections = -22% RLVs fines/points (still 2,600 RLVs/month)	1.0 second added yellow; -73% RLVs (700/month)
Location	**Ticket Cameras**	**Doing Nothing (Control Sites)**
North Carolina	RLTCs increased ALL crashes +40%; rear-end crashes +78%	Reduced crashes -25%
Oxnard, CA	RLTCs = -5% ALL (inconclusive); +180% rear-end (18 before/51 after)	-10% ALL (Santa Barbara); best injury rate (San Bernardino)
Winnepeg, Canada	RLTCs = +58% ALL; +64% injuries	+7% ALL
Fairfax, VA	RLTCs (5 sites) one year after = 40 average daily RLVs	25 RLVs (Fairfax County) 28 RLVs (Arlington County) 29 RLVs (Boca Raton, FL)

The three leading human factors related to serious red-light violation crashes are DWI, emergencies, and not paying attention. Ticket cameras fail to deter or prevent these dangerous situations, which comprise over 90% of the RLV fatal crash pie.

DWI accounts for 45% of fatal RLV crashes. Police need to better apprehend dangerous drivers intoxicated on alcohol and/or drugs (illegal and prescription) BEFORE they kill. The lack of police enforcement at ticket camera signals indirectly causes more fatalities. Cameras can NOT deter, prevent, apprehend, or even identify reckless drivers (including felons). RLTCs can only helplessly photograph their license plate, allowing them longer time on the road. Only live, alert police officers can apprehend these deadly motorists and possibly PREVENT a fatality.

About 24% of serious/fatal RLV collisions involve emergencies, including at least 12% of national annual RLV fatalities (110 of 950) caused by police chases. Police departments need to curb unnecessary chases, especially after traffic violators. It's not worth dying over. EMS and citizens need to be alert and carefully negotiate intersections during emergencies.

Not paying attention (22% or more) rounds out the top three causes of fatal RLV wrecks. This can be improved through awareness, education, driver training, and also engineering. Some police enforcement might help. People, please refrain from cell phone use, especially on busy streets with traffic signals. Being sober, alert, and paying attention is the cornerstone of safe driving.

As revealed in TRUTH, camera proponents themselves have inadvertently, but clearly admitted that their product is a complete failure as a "safety" device.

Ticket cameras are not even a good deterrent to red-light violations. Added yellow time seriously trounces cameras in reducing RLVs as well as safety (Mesa, San Diego). Camera promoters own control sites reveal that doing NOTHING results in better safety and violation rates than employing ticket cameras.

Camera enforcement remains a complete and total FRAUD designed to deceive people into surrendering their guaranteed rights, money, and safety to provide millions $$$ in corporate/government profits. Over 500 (and counting) people have died as a result of these traffic enforcement for profit devices. The only ethical thing to do is dismantle all ticket camera programs and ban them forever.