DADRL USA Steve Johnson submission to the EC November 2006

From: Steve Johnson [mailto:pgfault@yahoo.com]
Sent: 16 November 2006 17:34
To: TREN-E3-CONSULTATION@cec.eu.int
Subject: No support for mandatory DRLs

Please accept my commentary on your request regarding mandatory daytime running lights for the EU. Your recommendation presents only one side of the story and is taking the conclusions of some studies (many not peer reviewed!) to be incontrovertible facts.

I have a Ph.D. in physics and much of my career involved statistical analysis in computer models.

Thus, when NHTSA in the US produced two preliminary assessments of DRL effectiveness in 2000 and 2004, I was compelled to read and thoroughly study the reports.

First, my comments on the 2000 assessment:

NHTSA's preliminary assessment shows no improvement for DRL equipped vehicles in preventing fatalities in two vehicle crashes. Repeat, no improvement. This is from the fairly comprehensive FARS database. While not statistically significant, the Odds Ratio technique shows a net decrease in effectiveness for two vehicle fatal collisions.

NHTSA's assessment for non-fatal two vehicle collisions uses the SDS database for 4 out of 17 states. This does show an improvement for DRL equipped vehicles, but only when analyzed by using the Simple Odds analysis technique. No statistically significant benefit was found when using the Odds Ratio technique.

NHTSA did not account for vehicle wear and technology advances (ABS, traction control, etc.) when doing 'before and after' comparisons of the SDS database. Perhaps this is why newer vehicles were less likely to be in a collision than an older one, whereas when comparing DRL and non-DRL vehicles of the same age (e.g., GM vs. Ford), a benefit was found in only one case using Simple Odds.

Why didn't NHTSA report data from the other 13 states providing data to the SDS database? Was the data not favorable to DRLs?

NHTSA's assessment admits to difficulty in defining the collision types for the SDS data.

NHTSA did not analyze data from collisions involving light trucks. Why? Was the data not favorable to DRLs?

NHTSA did not analyze multi-vehicle collisions. Why?

NHTSA's pedestrian fatality analysis appears to be flawed. In each individual case, no statistically significant benefit was found. Using a statistician's slight of hand, they combine the results and come to the conclusion that there is a benefit.

The NHTSA assessment failed to examine DRL effectiveness in low-light conditions (dawn, dusk, poor weather).
I agree that having lights on during these times will reduce collisions. However, it becomes a statistical challenge to weed out the lit DRL vehicles from lit non-DRL vehicles.

To my knowledge, NHTSA's assessment has not been externally reviewed. Given the bias of the assessment exhibited in its introductory section, one must question the true motive of the study.

Next, my findings regarding the 2004 Assessment, again not a peer reviewed article:

In the Fall of 2004 NHTSA released a study suggesting possible benefits of daytime running lights (DRLs). The study was performed by Joseph Tessmer of NHTSA, and the text will be referred to as "Tessmer 2004." This study falls well short of validating any effectiveness of DRLs. In particular the results from Tessmer 2004 are inconclusive and even contradictory, and thus do not support mandating DRLs in the United States at this time. Because DRL effectiveness cannot be positively established some relief from the glare problems is urgently needed.

First off, in Tessmer's PowerPoint presentation, which was released prior to his paper, he acknowledges that the findings for two vehicle collisions were not statistically significant by his definition of a desired p-value ($p<0.05$), yet he still concluded that the Simple Odds analysis adequately demonstrates that DRLs are effective at crash reduction. This claim was also made in the report that was released this past Fall.

As Elvik noted in his 2003 intermediate report, Simple Odds values respond to other factors besides DRLs, and thus a stronger signal from Simple Odds might be obtained.
The signal, however, may not be particularly accurate in determining the effect of DRLs. The discussion that Elvik et.al. conduct under section 5.1, "Choice of estimator of the effects of DRL" (pp75-79) is particularly to the point.

Tessmer wrote that his reviewers asked him to also perform an Odds Ratio analysis to confirm the findings of Simple Odds. The justification for looking at the Odds Ratio results is to better isolate the effects of DRLs. However, Tessmer decided not to give equal coverage to the Odds Ratio analysis, omitted mention of the adverse finding in his conclusions, and relegated the treatment to an appendix.

That the Odds Ratio method did not back up the results of Simple Odds should be of concern to NHTSA. The matter that the p-value was somewhat higher for the Odds Ratio analysis than for Simple Odds should not be the decisive factor in establishing DRL effectiveness. As Phillips and Goodman write in Epidemiol Perspect Innov. 2004; 1: 3., "Researchers still frequently present results as if statistical significance and p-values are useful decision criteria, and decision makers are left with inadequate information."

One very important point regarding the input data is that it does not adequately distinguish between lit and unlit vehicles. While Tessmer separates the vehicle types based on VIN, it is not uncommon to find one out of twenty (5%) or more drivers who have manually activated their headlights on their non-DRL vehicles during clear, bright, conditions. On overcast days this percentage can be much higher. For example, on a recent winter trip to Minnesota, I estimated that roughly 50% of drivers of non-DRL vehicles were using headlamps under overcast conditions, even though the visibility at ground level was in excess of a mile. Because Tessmer's input data also included dusk and dawn conditions when many drivers will have manually activated their headlamps, the inaccuracy in the vehicle count grows considerably.

How can a non-DRL vehicle (a Ford in some of Tessmer's data) which is involved in a collision be properly counted if the driver has activated its headlamps? Without a proper accounting for this factor, any analysis becomes an exercise in futility.

Another troubling statistic that has not been addressed by NHTSA is the sharp increase in motorcycle fatalities in the US. Given that there has been a similar increase in DRL usage over the same period, this should have created an alarming wake up call within NHTSA.
Motorcyclists have realized the negative effects of automobile DRLs on their conspicuity and have taken action by upping the ante --- many cyclists now ride with their full intensity high beams on all the time. Not only do we have a problem with automobile DRLs, we're facing a growing problem with motorcyclists attempting to compete with the sea of automobile headlamps on our streets and highways.

Japan's decision not to implement automobile DRLs because of the DRLs' masking effects upon motorcycle conspicuity is of major significance. Japan's experiments on the masking effects are particularly telling (TRANS-WP29-GRE-51-10e). Specifically, NHTSA's proposed DRL intensity reductions from 1998 do not even come close to what the report recommended for adequate motorcycle conspicuity. While 1500 cd will likely still allow low beam headlamp implementations, Japan's study seems to indicate that something more along the lines of our parking lamp standards is the appropriate intensity for DRLs.

At this point, NHTSA cannot proceed with a cost effectiveness study regarding mandatory DRLs because the two internationally adopted measures of effectiveness contradict each other by showing respectively an increase and reduction of accidents from DRLs.

CONCLUSIONS:
I have reviewed two modern assessments of DRL effectiveness performed in the US. In each case there were serious flaws in the methodology and conclusions. While not directly addressing other studies that you are using to attempt to support mandatory DRL usage in the EU, many of the same commentary will still apply. The numbers are pretty much a wash, and in some cases (unfortunately) contrived. Basing a continent-wide decision on such weak data would be grossly unwise.

Respectfully submitted,

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