

Right-Turn-on-Red Laws and Motor Vehicle Crashes

by
Paul L. Zador

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In the 1970's all of the states that previously had not permitted right turns on red at traffic signals (RTOR) adopted the so-called western law permitting RTOR after stopping unless specifically prohibited by a sign. Such turns are now allowed nationwide except in New York City.

Over half of the states adopted RTOR laws between 1974 and 1980, and over a third of them did so after Congress passed the Energy Policy and Savings Act of 1975. This Act invited states to develop a state energy conservation plan, one requirement of which was "a traffic law or regulation which, to the maximum extent consistent with safety, permits the operator of a motor vehicle to turn such a vehicle right at a red stop sign after stopping" (1). The RTOR laws adopted by most states were modeled on the Uniform Vehicle Code established by the National Committee on Uniform Traffic Laws and Ordinances (2). This model law specifies that drivers must stop and yield to approaching vehicles and to all pedestrians within the intersection before turning right on red.

Several studies now have shown that RTOR laws have increased the frequency of right-turning crashes at signalized intersections, particularly crashes involving pedestrians and bicyclists. For all crashes involving vehicles turning right, the increase has been estimated at between 10 and 40 percent (3-8).

A 1976 Federal Highway Administration (FHWA)-sponsored study estimated that the increase in crashes resulting from RTOR would be relatively small. The study did not estimate a percentage increase but said that the additional crashes resulting from allowing RTOR at 80 percent of the signalized intersections in the country would not exceed 11,200 (3). This estimate was based in part on two field tests, the only such tests of RTOR available at the time. The data from these tests were subsequently reanalyzed by Galin of the Australian Road Research Board. He reported, as did Insurance Institute for Highway Safety researchers in a separate study, that after the implementation of RTOR, right-turning crashes increased 30-40 percent more than other crashes at the same test sites (4,6).

In a later study of the consequences of adopting RTOR at 732 intersections, the American Association of State Highway and Transportation Officials (AASHTO) determined that there was a 37 percent increase in crashes involving right turns at these intersections after RTOR (5).

Based on such estimates, FHWA's 1976 national projection of increased crashes due to RTOR was too low by a factor of at least three.

Zador et al compared crash experience in six states that adopted RTOR laws with that of three states that did not during the same time period, and found an increase of about 20 percent in right-turning crashes at all signalized intersections, including those where RTOR was still prohibited (6,9). Joksch reanalyzed these data and estimated the increase due to RTOR at 14 percent (7).

Novak compared the frequency of right-turning crashes at all signalized intersections for five-year periods immediately before and after the adoption of RTOR in Milwaukee. He reported an increase in these crashes of about 24 percent (8,12).

In regard to right-turning crashes involving pedestrians at signalized intersections, Zador et al estimated that an increase of 57 percent was attributable to the adoption of RTOR laws (6,9). In a study sponsored by the National Highway Traffic Safety Administration (NHTSA), Preusser et al reported that right-turning crashes involving pedestrians at signalized intersections increased between 43 and 107 percent in four cities subsequent to the adoption of RTOR, and that as a percentage of all pedestrian crashes those involving right-turning vehicles increased 55 percent. The same study reported that right-turning crashes involving bicyclists increased between 72 and 82 percent, and that as a percentage of all bicyclist crashes those involving right-turning vehicles increased 99 percent (10,12). The vast majority of these crashes reportedly occurred when the pedestrian or bicyclist was coming from the driver's right and remained undetected because the driver was looking to the left for a gap in traffic (10).

Compliance with the stopping requirement of RTOR was monitored in Maryland as the new law was becoming widely adopted. It was found that the percentage of drivers who turned right on a red signal without stopping increased from 47 percent to 70 percent during the changeover period, and that many of those who did not stop proceeded under unsafe conditions (11).

Research has also shown that, for all crash types investigated, the adoption of RTOR leads to larger increases in crashes in urban areas than in other areas. Pedestrian crashes increase more among older people than among other age groups. Under adverse weather conditions, pedestrian and bicyclist crashes increase more than under normal weather conditions. The severity of injuries associated with the additional crashes tends to be low (6,10). No evidence has been found to indicate that the increased crash frequency is a temporary phenomenon (10).

Notes

1. Pub. L. No. 94-163, Section 362(c)(5), 42 USC 6322.
2. *Uniform Vehicle Code and Model Traffic Ordinance*. National Committee on Uniform Traffic Laws and Ordinances, Charlottesville, VA. The Michie Company, 1968 (1980 Annual Supplement).
3. McGee, H.W., Stimpson, W.A., Cohen, J., King, G.F., and Morris, R.F. *Right Turn on Red, Volume I: Final Technical Report*, Report No. FHWA-RD-76-89, Alan M. Voorhees and Associates, McLean, VA (1976).
4. Galin, D., Re-Evaluation of Accident Experience with Right Turn on Red, *ITE Journal*, 51(1), 24-27 (1981).
5. American Association of State Highway and Transportation Officials, *Safety and Delay Impact of Right Turn on Red*, Task Force on Right Turn on Red (D.E. Orne, Chairman), Washington, D.C. 1979.
6. Zador, P.L., Moshman, J., and Marcus, L. Adoption of Right Turn on Red: Effects of Crashes at Signalized Intersections, *Acc. Anal. & Prev.* 14(3), 219-235 (1982).
7. Joksch, H.C., Right-Turn-on-Red and Accidents: A Detailed Analysis of the Data Used by Zador, Moshman and Marcus, *Acc. Anal. & Prev.* 14(3), 235-238 (1982).
8. Novak, D.A., *Right Turn on Red Safety Versus Operation Benefits City of Milwaukee Experience*, City of Milwaukee, Bureau of Traffic Engineering and Electrical Services, Traffic Engineering Division, Research and Planning Section (1981).
9. Right-Turn-on-Red Laws Raise Intersection Toll, *Status Report*, Vol. 15, No. 18, Insurance Institute for Highway Safety (1980).
10. Preusser, D.F., Leaf, W.A., DeBartolo, K.B. and Blomberg, R.D., *The Effect of Right-Turn-On-Red on Pedestrian and Bicyclist Accidents*, Report No. DOT HS 806 182, Dunlap and Associates, Inc., Darien, Connecticut (1981).
11. Baumgaertner, W.E., ... After Stop, Compliance with Right Turn on Red After Stop, *ITE Journal* 51(1), 19-27 (1981).
12. Right-Turn-on-Red Laws Raise Intersection Toll, *Status Report*, Vol. 17, No. 11, Insurance Institute for Highway Safety (1982).