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Who Ran the Red Light?

by Dror Kopernik, P.E. ¹ and John Goebelbecker, P.E. ²*Two vehicles collide in an intersection. Each driver claims, "I had a green light!"*

INTRODUCTION

Reconstruction of vehicle accidents involves analyzing physical and testimonial evidence. However, physical evidence that remains after a collision in an intersection is independent of signal-light color and can never resolve the question of who ran the red light. Furthermore, drivers often disagree and witnesses may not have observed the lights in question. In these cases, analyzing testimony that correlates the color of any signals in the intersection with accident events may reveal the culprit.

METHOD

Traffic Signal Timing Schedules provide detailed specifications of traffic-light sequencing and timing and can be readily obtained from highway departments. These schedules indicate the color change times of every signal in an intersection throughout an entire cycle. If the color of one signal is known at any time, the color of all other signals at that time can be determined.

In their somewhat complex and technical format, timing charts are difficult to interpret. However, they can be presented in a simplified form using the signal colors of red, yellow, and green to create an easy-to-use analytical tool (See Fig. 1). Testimony regarding the color of a specific signal at the time of the accident may define a unique time interval on the chart. The simplified diagram can then be used to determine the color of any signal of interest just prior to the accident.

CASE STUDY

A northbound car on Main Street collided with a westbound van on 2nd Avenue (See Fig. 2). Both drivers claimed they had a green light when entering the intersection. A witness stated that she did not see the respective signals of the disputing drivers, but she did recall that the signal for southbound traffic (3) was red at the time of the collision and that it changed from red to green just after the collision.

The traffic signal timing schedule for the intersection shown in Fig. 1 indicates that the signal for southbound traffic (3) changes from red to green after the northbound traffic signal (2) has been green for 52 seconds. At that time, the westbound traffic signal (4) has been red for 52 seconds. Therefore the westbound van ran the red light. The status of the signals at the time of the collision is illustrated in Fig. 2.

If it were assumed that the southbound and northbound signals operated in unison as opposing signals often do, one would have incorrectly concluded that the northbound car ran the red light because the witness saw a red southbound signal at the time of the collision.

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