



"Authorization to Experiment"

By Michael A. Harrison

President/CEO ~ LightGuard Systems, Inc.

The concept of "In-Pavement Warning Lights" (IRWL's) at crosswalks was approved by the California Traffic Control Devices Committee (CTCDC) for experimental evaluation.

As part of this evaluation, the City of Santa Rosa, California, agreed in 1993 to have IRWL systems installed at three locations chosen by them. These systems were designed by my newly minted company, "LightGuard Systems, Inc." I chose a name that would fit the concept of a lighted crossing guard.

The application for a permit from the FHWA mandated "before and after" studies to determine whether the proposed system 1) would work as anticipated and 2) would not create any unforeseen problems for motorists or pedestrians.

As a Corporate Pilot and Flight Instructor (and in earlier years an aircraft mechanic in the U.S. Navy), I was well aware of "runway" lights. I was also aware of the fact that they were costly to purchase, install and maintain. They were not a proper consideration for the highways or internal roads.

We set out to develop a product that was similar to reflective raised pavement markers in use on the roadways; however we wanted to internally illuminate them. We knew the product needed to be easy to install and yet rugged. How we would get this done was the issue.

The main focal point of initial field testing was to determine the "human factors"... Would motorist "yield" to the lights without causing other problems? Working with Whitlock and Weinberger and Associates, the firm contracted by the State to perform the evaluations and reports, we set out to comply with State mandated guidelines. The very first test site was installed, and the location of the "signal heads" was determined.

We placed one signal head in the center of the divider lane, and one signal head in the center of each lane full span across the crosswalk. The in-pavement signal lights featured unidirectional light beams focalized towards the approaching motorist. We of course designed the signal heads to be shielded from the view of the pedestrian as mandated to avoid giving them a false sense of security by seeing the lights and assuming it safe to cross. The idea of full span was to give the trailing vehicle in a platoon the opportunity to view the lights and understand "why" the vehicle in front may be braking.

This initial IRWL enhanced crosswalk system resulted in a very high percentage of vehicle compliance. Analysis showed an average increase of 70% of vehicular traffic yielding to pedestrians in the crosswalk zone. This is a phenomenal increase number in traffic compliance "numbers". The final report can be viewed ([Click Here](#)). It was suggested that we try adding one additional in-pavement signal light at each "edge" or parking lane, and when this was done we obtained even greater compliance as shown in subsequent analysis.

The second and third sites were installed in that fashion, and the studies were presented to the CTCDC. Due to the high degree of success in this phase of analysis, five additional cities were authorized to experiment. Data from each of those cities resulted in the Final Report. This report to

Caltrans concluded in the "Recommendations and Findings" section that "The current installation pattern should be maintained as a standard".

While "Authorization to Experiment" in California was a good start, concurrent Federal Authorization to Experiment was also achieved for the crosswalk warning system. Through numerous meetings and the studies and reports provided, the NCUTCD (National Committee for Uniform Traffic Control Devices) proposed that IRWL enhanced crosswalk systems be included in the Millennium Edition, (2000), of the MUTCD.

Language for the newly minted section for IRWL's, at that time Section 4.L, was drafted based upon the studies and testing completed and submitted to the committee. IRWL layout pattern recommended to the committee was drafted to meet the recommendation that "The current installation pattern should be maintained as a standard" ([Click Here](#)).

The use of unidirectional lights as developed by LightGuard and recommended by the CTCDC is a critical concept. During the final draft session by the NCUTCD, a "recommendation" from a company proposing to use "runway" lights was injected stating that "bi-directional" lights should be also included. This proposal was presented with not one report or study to back up or prove "sound engineering judgment." Furthermore, the inclusion of bi-directional lights presented potential degradation of the data being offered. New language was subsequently crafted to include this notion of bi-directional lights, and was ultimately "straw poll" approved at the final meeting. This is how the "bi-directional" standard was incorporated into the language, much to our dismay.

We feel powerfully that the LightGuard Systems, Inc. Crosswalk Warning System is safe and effective due to complying with all engineering professionals' advice along the way. We do not want the pedestrian to have the potential for a false sense of security. This system is designed to give "the motorist" an advantage, not necessarily the pedestrian, the net recipient of the motorist being adequately alerted.

Our next topic will cover the "activation" methods, and the extended testing that led to our extremely reliable "passive" activation system.

www.crosswalks.com