Interactive Traffic Signal System Laboratory at Purdue

Darcy Bullock[1]

ABSTRACT

The 1990's began a new direction in traffic signal control partly as a result of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and partly as the result of rapidly developing computer and communication technology. The advancements in the computer and communication fields provided the enabling technology that provided affordable computing platforms for developing improved traffic signal controllers and associated peripherals. We have reached the point where traffic signal systems are a very complex large scale distributed computing network that is expected to function under adverse conditions with little or no "down-time." Because of the complex system interactions, it is highly undesirable to train new engineers and technicians on the job, because of the severe impact mistakes can have during training.

Just as aircraft pilots train on flight simulators before piloting a real aircraft, Purdue has developed a traffic signal system simulator that uses real traffic signal controllers to control simulated traffic (Figure 1). This environment allows a wide variety of training exercises to be conducted in the Purdue laboratory for INDot engineer and technicians as well as Purdue students. Typical exercises include: detector wiring, conflict monitor configuration, cabinet trouble shooting, isolated intersection programming, coordinate actuated system programming, coordinated actuated tuning procedures, and closed loop system set up and evaluation. Furthermore, the laboratory can be used to do before/after analysis before a proposed new signal timing strategy is deployed in the field.
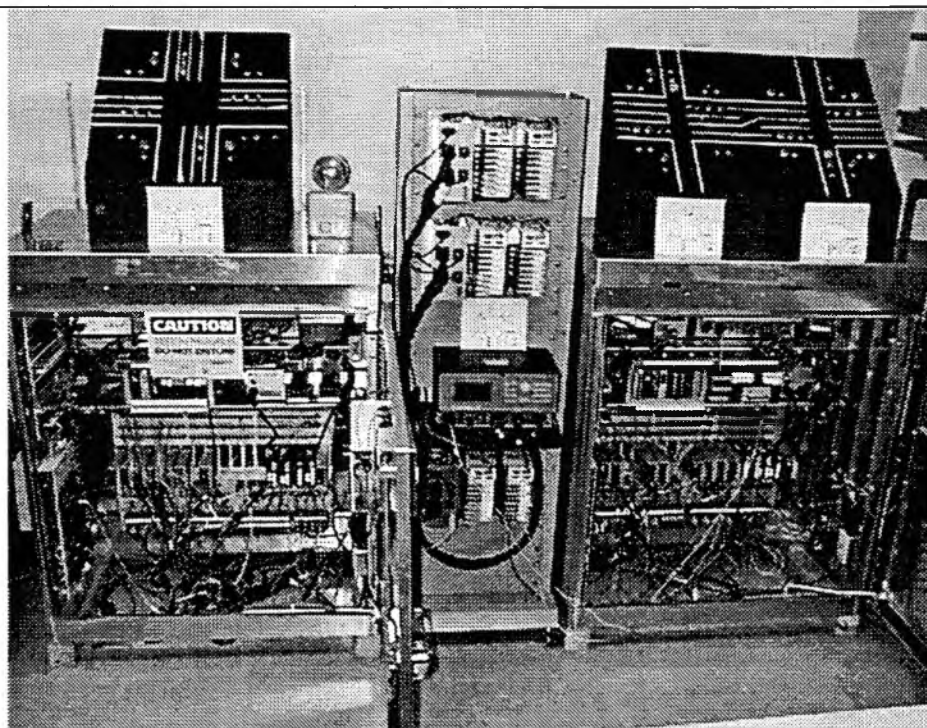
Figure 1: Photograph of Traffic Signal System Simulation Laboratory

[1] Associate Professor, School of Civil Engineering, Purdue University, West Lafayette, IN 47907; Phone: (765) 494-2226; Fax: (765) 496-1105; darcy@purdue.edu; www.ecn.purdue.edu/~darcy