AN ABSTRACT

APPLICATION OF COMPUTER-BASED TRAINING TOOLS IN
TRAFFIC ENGINEERING EDUCATION

by

RIAD MALKI

Advisors: WILLIAM McSHANE, PHILIP HABIB
Submitted in Partial Fulfillment of the Requirements
for the Degree of
Doctor of Philosophy (Transportation Planning and Engineering)
January 1987

The dissertation intends to explore how expert systems and other computer-oriented tools can aid traffic engineering education, particularly in situations in which instructional staff is limited (in number or experience) or in which the range of skills of the students varies widely.

To do that, the dissertation addresses the problem by using two expert system "modules" in addition to the Time-Space Diagram and Highway Capacity Manual (HCM) computer programs to determine whether the outcome is indeed effective in training the students and enhancing the traffic engineering education.

The permenent interaction of students with computer-based training tools will aid them to understand better the different aspects of traffic engineering, also it helps in the

retention/qualification of students, in the flexibility in self-matching of skills and student self-paced learning, in addition to learning by doing.

The computer tools which were implemented in the dissertation did match to purpose, since the intentions were to maximize student involvement in essence of lesson to be learned and to match instructor and computer resources available to students.

The focus of the dissertation was on Signalized Intersection, through the development of two expert system programs dealing with Phasing and Sizing aspects. The purpose of the application of phasing was to address problems which involve more judgement and options through decision-making, the T-S Software emphasized the need of students to focus on essence rather than learning computer, while the HCM program demonstrated the ability to remove the burden of learning computation.