54

ROADSIDE SAFETY IMPROVEMENTS

by

CAROL SUE ESTES

B.S.C.E., University of Kansas, 1971

-

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Civil Engineering

Kansas State University
Manhattan, Kansas

1975

Approved by:

Bob L Smith

Major Professor

LD
2668
R4
1975
.I87
C.2
Document

INTRODUCTION

Single vehicle accidents account for about 50 percent of fatal accidents and approximately 40 percent of all accidents on freeways. Certain elements of roadside design are heavy contributors to single vehicle accidents. Bridge abutments and piers, bridgerails, signposts, luminaire supports, utility poles, trees, drainage structures, steep side slopes and guardrails are the heaviest contributors. The influence of roadside design is, therefore, an important safety consideration.

Roadside safety improvements were largely ignored until the early 1960's. Fatality rates rose to over 50,000 people a year before Congress recognized a state of emergency. In 1966 Congress passed the Highway Safety Acts, at last recognizing the need for uniform national policy for roadside safety. Also in 1966, the Special Traffic Safety Committee of the American Association of State Highway Officials (AASHO) conducted a nationwide survey of highways, studying the effects of design and operational practices in relation to safety. The reports were published under the title "Highway Design and Operational Practices Related to Highway Safety," in February of 1967 after approval of the AASHO Executive Committee. Commonly known as the "Yellow Book", the AASHO report was composed of discussion, comments and recommendations of the committee about various aspects of design and practices

related to safety on roads and streets under local and state transportation department control. Yellow Book concepts were endorsed by the Federal Highway Administration and it became policy to incorporate provisions of the report in the plans for all projects of high-speed facilities (design speeds of 50 MPH or more). It was also recommended that information from the report be utilized on primary and secondary projects with lower design speeds. The Federal Highway Administration then asked state and local agencies to apply "Yellow Book" standards in a corrective program to Federal-aid-projects already completed.

Further impetus was given to the safety movement with the adoption of the Highway Safety Program Standards which were a direct result of the Highway Safety Act of 1966. HSPS 9, "Identification and Surveillance of Accident Locations," HSPS 12, "Highway Design, Construction, and Maintenance," and HSPS 13, "Traffic Engineering Services," all require establishment of programs based on the "Yellow Book" principles.

The Congress of the United States has taken a more active interest in roadside safety recently. A series of hearings by subcommittees of the House Committee on Public Works dealing with highway safety, design, and operations dealt with the question of responsibility. In "The Need For a Safer Driving Environment" (93rd Congress, 1st session, Committee Print 93-7), the committee states;

> "On this the committee is adamant. It is the responsibility of Government and specifically those

agencies that, by law, have been given that mandate. This responsibility begins with Congress and flows through the Department of Transportation, its Federal Highway Administration, the State highway departments and safety agencies, and the street and highway units of counties, townships, cities, and towns. There is no retreating from this mandate, either in letter or in spirit."

The Federal-Aid Highway Act of 1973 shows Congressional concern is still strong. The act contains several specific authorizations for safety programs. In addition to Federal-Aid Systems programs, there are for the first time, programs to use federal funds for non Federal-Aid system projects in the area of construction improvement of the driving environment.

It is obvious that federal funding of highway projects is a major factor in the reduction of roadside hazards. The 1972 Highway Needs Study of the Department of Transportation showed that over 600 billion dollars would be needed in the period up to 1990. Of this, $560 billion would be spent for highways and bridges, $19 billion for urban highways, and $32 billion for the completion of the Interstate System.

In 1973 before the Congressional Public Works Committee, AASHTO (formerly AASHO) recommended a 50 percent funding of the improvements recommended by the Needs Study. Since financial resources are not unlimited, all the projected needs could not realistically be met. It was felt that the

50 percent level would allow for the correction of many narrow bridges, substandard roadway sections, and roadside hazards, as well as other deficiencies.