

SUMMARY REPORT 19-3(S)

A COMPUTER TECHNIQUE FOR PERSPECTIVE PLOTTING OF ROADWAYS

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A Computer Technique for Perspective Plotting of Roadways

by

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The Texas Transportation Institute conducted an investigation of the possibility of developing a means whereby the highway designer may view his design prior to construction. This means would replace the expensive models that have previously been constructed to satisfy the needs of the designer.

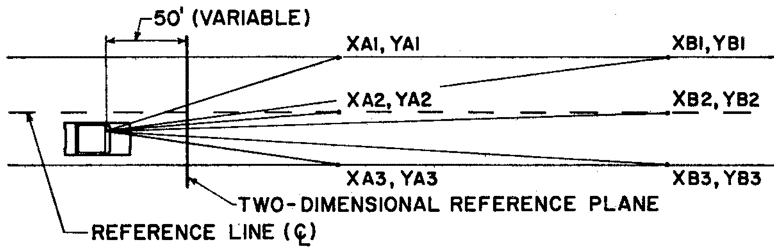
In this investigation, the digital computer has been used as a means of preparing perspective views of the roadway. The developed technique would conceivably have application in general roadway design, interchange design, and in the effective location of signs and other traffic control devices. An attempt has been made to provide a workable tool based on sound principles which can be easily understood and used by designers having little or no previous computer knowledge. The IBM 7094 digital computer was used in the developing and checking of the numerical methods of this research. The program package was organized as a 7094 FORTRAN main program which links several 7094 sub-routines to perform the various manipulations required. A Calcomp model 565 digital plotter linked to an IBM 1401 digital computer was used to draw the individual roadway plots.

The basic concepts involved in the study are fundamentals of elementary geometry and highway engineering principles. In order to obtain a description of the roadway in perspective as the driver sees it, selected points from a three dimensional roadway are projected onto a common two dimensional reference plane as shown in Figure 1. The selected points are joined to represent the driver's visual input.

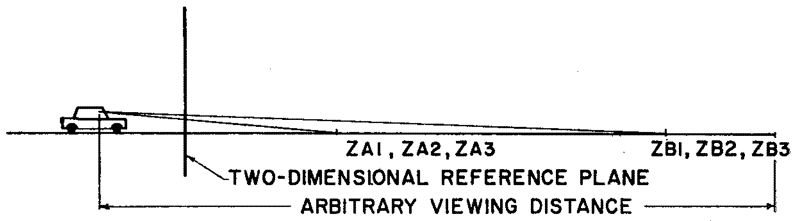
The plotting programs are governed by a parameter card allowing plotting of a profile, plan, or perspective view of the roadway. Obstructions are plotted in the roadway in the perspective view only. The plotting program generates on an output tape of pen movements sufficient to plot the desired view on the Model 565 digital plotter.

Summary of Results

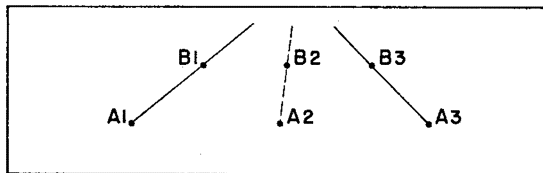
1. The methods described provide a useful new tool to be used in the design of roadways to fit the driver's needs. Any object along the roadway that may be represented in X and Y coordinate values may now be viewed in perspective.



PLAN



PROFILE



TWO-DIMENSIONAL REFERENCE PLANE

PERSPECTIVE

GENERAL CONCEPT OF PERSPECTIVE
PLOTTING PROGRAM

Figure 1.

