

## EVALUATION OF THE FUNCTION OF MODELS IN INTERCHANGE DESIGN <sup>30</sup>

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The purpose of the research was three-fold:

1. To study model construction methods including an evaluation of materials, scales, amount of detail actually needed, and other factors discovered during the course of the work.
2. To determine the function of a model in the design process, and its role in the presentation of the completed design.
3. To investigate advanced techniques of three-dimensional geometric design of highways and interchanges to include computerized perspective plotting.

The work included:

1. Construction of a complete terrain model of the I 275, Dixie Highway, Turkey Foot Road Interchange and, at an exaggerated vertical scale, a skeletal model of the I 275 and I 475 Interchange.
2. Coordination with the Division of Design, Kentucky Department of Highways during the construction of the models to include periodic evaluations of both the model construction procedures and the details of the interchange designs. This resulted in some time-consuming false starts and model reconstruction during the project.
3. Application of those advanced techniques immediately available to the project in the evaluation of the interchange designs (computerized 3-D drawings).
4. Preparation of a final report on the project to include recommendations pertinent to the accomplishment of the stated objectives.
5. Presentation of the models and the report to the Department of Highways.

The conclusions were:

1. There are inherent drawbacks in using an elaborate physical model as a design testing device: long time lag, high cost, inability to produce information about the driver's point of view and difficulty of quickly reflecting design changes. The complete model showing houses, trees, terrain, etc., is, of course, very useful (and convincing, propagandawise) in public presentations of a proposed design.
2. A skeletal device such as the Abbott Model System is more adaptable to the physical design evaluation process.
3. Detailed analysis of interchange geometrics can be implemented through computerized perspective drawings made sequentially from the driver's viewpoint along ramps and approaches.

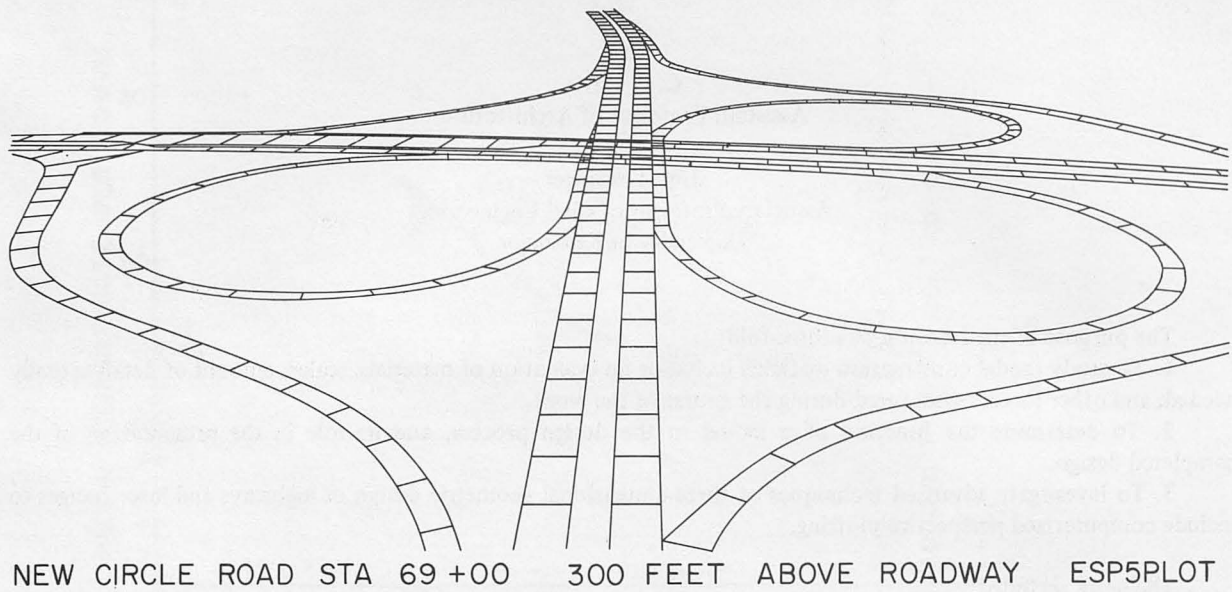


Figure 47. Computer-Drawn Perspective View of New Circle Road-Newtown Road Interchange

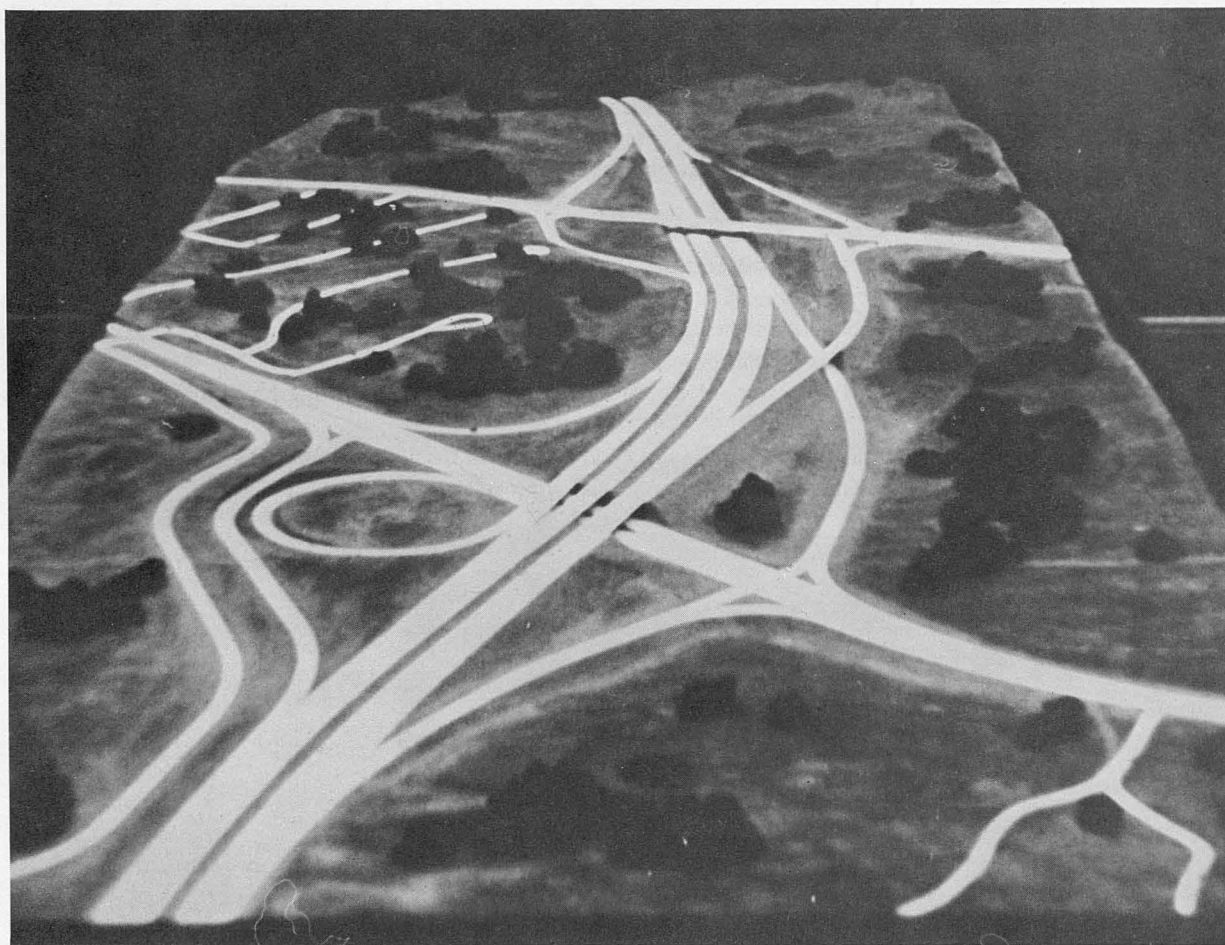


Figure 48. Interchange Model of I 275, Dixie Highway-Turkey Foot Road Interchange near Newport, Kentucky