

1. INTRODUCTION

A potentially important impact of any highway project is its effect on the spatial distribution of urban development. This type of impact is often referred to as a secondary land-use impact, in order to distinguish it from changes in land-use that occur within the right-of-way of the highway. Secondary land-use impacts are not direct consequences of the project, but result from modifications in access to parcels of land and from modifications in travel time between various points in the urban area. Secondary land-use impacts have included regional shopping center developments, urban sprawl, and economic decline of central business districts. The reasons why highway projects cause impacts on land use have been well understood for at least two decades (Anas, 1984). However, existing techniques for assessing land-use impacts are directed toward large freeway and rail transit systems in major urban areas. Little prior effort has been devoted to formulating techniques that could be used for assessing impacts of highway projects in or near small communities -- the type of project that is now most often built.

The purpose of this study was to determine the applicability of existing techniques for assessing highway-related impacts in small communities. Various techniques were evaluated by applying them to one or more case study projects. The projects were completed between 10 and 20 years ago -- long enough so that any changes in the development pattern of the urban area would be readily apparent. As best as possible, the techniques were applied as they would have been at the time of the projects. The case study cities were Eau Claire, Sheboygan, Wausau, and Wisconsin Rapids. The projects were of two types: widening of an existing facility (Eau Claire and Wisconsin Rapids) and a freeway bypass within a completely new right-of-way (Sheboygan and Wausau). These case study projects were selected, with the assistance of WisDOT's staff, because they are typical of the types of projects that would be constructed in Wisconsin in the foreseeable future.

Existing techniques were categorized as (1) assessment by experts, such as an expert panel or gaming-simulation, (2) computer simulations, (3) statistical models, or (4) qualitative assessment, such as a series of short questions, a checklist, or a cross-impact matrix. A representative technique was selected from each category. An attempt was made to adopt, intact, existing techniques. Substantial problems in doing so were encountered. Some techniques were specific to a particular location or to a particular type of project; application of other techniques required more time and/or effort than would be reasonable for most current projects. Therefore, extensive

revision was performed to tailor the techniques to the specific problem of highway impact assessment in small cities. The final techniques were a multiple-round, structured expert panel that was derived primarily from the Delphi Method; a Lowry Model of the relationship between transportation and land use; an application of average levels of development; and two checklists.

Two types of validation were sought for each technique. The first validation was that the forecasts from the techniques should correspond to actual patterns of development since the project was built. The second validation, and just as important, was that the techniques should not require more effort than would be justified by the quality and usefulness of the results.