Investigation of the Impacts of Rural Development on Iowa’s Secondary Road Systems

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ABSTRACT

Rural areas across the state of Iowa and the entire nation are facing a number of problems associated with increasing development. The impact of this development on rural road systems is one significant problem. While research has been directed at other impacts, such as loss of quality agricultural land, fragmentation of natural habitat, water quality, land use compatibility, and provisions for other infrastructure and government services, much of this work does not sufficiently address the physical impacts on local roadways. Furthermore, very little research is designed to provide local decision makers with tools for making day-to-day decisions on development proposals. Many counties in Iowa are increasingly faced with proposed rural developments, such as rural residential subdivisions and livestock production operations, that generate substantial new traffic on secondary road facilities. In fact, the creation of rural residential subdivisions is a much more significant producer of land use change in Iowa than is urbanization in the form of municipal annexation (Iowa State University Extension to Communities 2001).

In order to better understand the impact of rural development on the secondary road system, a geographic information systems analysis was used to quantify the spatial relationship between these developments and various physical features and illustrate the nature of the rural development impacts. Previous work conducted by the Center for Transportation Research and Education on land use change in Iowa indicates that rural residential subdivisions that provide primary residences appear to be locating in areas with excellent access to major transportation arteries within a half-hour commute of Iowa’s metropolitan centers or other trade centers. They also tend to be locating near amenities such as surface water and forested land and not on prime farm land. This means that such subdivisions tend to be concentrated in...
areas that fit a specific spatial profile. On the other hand, livestock operation locations are regulated by the Department of Natural Resources’ Master Matrix, and they tend to develop in rather isolated areas so that environmental and social impacts can be minimized. They appear much more randomly distributed across the map of Iowa.

This spatial analysis provides a better understanding of where and how rural development happens, ultimately providing local decision makers with better tools to quantify potential traffic generation, analyze build-out scenarios, estimate true costs of community services, and further understand the fiscal impacts and associated legal issues of such development.

Key words: economic analysis—geographic information systems—rural development—secondary roads