

# **Environmental-Sensitive Corridor Planning Using Spatial Multi-Criteria Decision Making**

**Rodrigo A. A. Nobrega** sal@gri.msstate.edu

**Charles O'Hara, C., Sadasivuni, R., Dumas, J.**

**Geosystems Research Institute, Mississippi State University**

2nd Research Boulevard, Starkville MS, 39759, phone 662 325-0821, fax 662 325-7692

## **Abstract:**

Evaluating alignments on transportation corridor studies is a complex process that involves different factors and criteria. Multi-Criteria Decision Making (MCDM) is a systematic methodology to compare, select, and rank multiple alternatives from conflicting values and opinions based on computational hierarchy approach that can be implemented in a GIS. It offers the opportunity to improve the coordination and collaboration among planning organizations, resources agencies, transportation practitioners and affected citizens.

This paper addresses a GIS-based multi-criteria decision framework focusing on environmental and early planning needs in transportation corridors. The study is developed along the Interstate-269, which bypasses Memphis-TN. The input information is composed from bio-physical and socio-economic data. The thematic layers correspond to the decision factors and their attributes correspond to the criteria being considered. At first, criteria are ranked and single scenarios are computed. Then, single scenarios are combined into a multi-factor scenario using factor ranking. The results show close similarity to results of traditional planning methods, but were generated using automated approaches. Streamlining early planning and environmental implications enables corridor alternatives to be generated in an efficient and systematic manner and multiple scenarios to be considered in the transportation planning process to facilitate major decisions prior to engineering approaches.

**Keywords: EIS, early planning, transportation planning, MCDM, GIS**