RESEARCH ADMINISTRATION
Bureau of Field Services
Michigan Department of Transportation

Research Spotlight

A framework for planning right of way development

Roadside rights of way serve a wide range of societal, economic and environmental functions. While these functions traditionally include providing space for transportation infrastructure, utilities and drainage, Michigan and many other states are receiving an increasing number of requests for nontraditional development in roadside rights of way. The decision framework developed in this study is a first step toward a systematic, statewide approach to evaluating these requests.

Project Information

REPORT NAME: Decision Framework for Corridor Planning within the Roadside Right of Way

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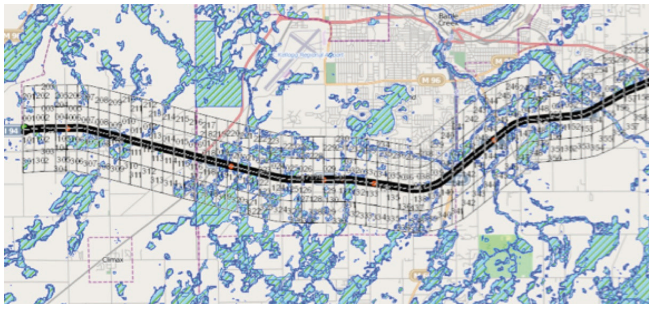
MDOT Project Manager

Lynn Lynwood

Roadside Development Program
Michigan Department of Transportation
425 W. Ottawa Street
Lansing, MI 48909
lynwoodl@michigan.gov
517-373-0026

Problem

Evaluating requests for nontraditional right of way development, such as solar and wind power generation, biofuel production, vegetation management, and environmental preservation and remediation projects, can be difficult. There is minimal guidance on evaluating these projects, as state and federal guidelines tend to focus on traditional types of development. MDOT currently handles these requests on an ad hoc basis, but this approach is inefficient. The department has struggled with coordinating the land use, economic development and conservation plans that are related to these nontraditional development requests but that do not necessarily fall directly under MDOT's purview. This study was aimed at developing a decision framework for evaluating roadside right of way development based on contextual features of the area.



For a 20-mile-long test area along I-94, researchers used a GIS shapefile to quantify the prevalence of each type of roadside contextual feature, such as percentage of wetlands. As part of a decision framework tool, this data can help quantify a location's compatibility with a given type of right of way development.

Approach

The primary objective of the framework was to provide a roadside suitability assessment model that can be used to support integrated decision-making and policy-level considerations for right of way use and development. The model was designed to allow for evaluation of a broad

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"A holistic management strategy has the potential to be more efficient and save money over our current patchwork approach. This project represents a first look at using this technology to see if it's viable as a planning tool."

Lynn Lynwood
Project Manager

range of potential types of developments while considering a diverse range of roadside contextual features, including land use (current and future), land cover, environmental features, natural resources, and plant and animal habitats. The model output may be used to help determine the areas along a highway corridor that are most (or least) suitable for development within the roadside right of way.

Research

Based on a review of published research and nationwide practice combined with input from a stakeholder focus group and the MDOT Research Advisory Panel, researchers created a set of ratings assessing the compatibility of 33 different contextual features with five types of nontraditional right of way development. The five classes included solar and wind power production, vegetation management/landscaping, agriculture/farming, and green infrastructure. These compatibility ratings serve as the basis for the roadside suitability assessment model.

To test the framework, researchers demonstrated the roadside suitability assessment model using a 20-mile pilot section of I-94 in Kalamazoo and Calhoun counties. Researchers divided the pilot section into parcels 1/4 mile long by 1/2 mile wide (80 acres) on either side of the roadway. Using both geospatial and nongeospatial data on the contextual features, researchers calculated the amount of each contextual feature within each 80-acre parcel. Researchers then weighted the results using the compatibility ratings to determine a Roadside Suitability Index (RSI) for each type of development in each parcel. These RSI values can be compared to each other to identify the most and least appropriate areas along the corridor for a given type of development.

Results

The pilot project showed promise in producing results consistent with standard land-use planning considerations.

Because geospatial data on all 33 contextual features is not consistently available statewide, researchers evaluated whether the decision framework would be effective using fewer features. They calculated and compared RSI scores for three levels of data. The first level incorporated all 33 contextual features. The second incorporated data about the 21 features currently available in a statewide geospatial data set. The third level used a subset of only seven of these features.

The first and second levels of analysis produced similar, though not identical, conclusions regarding the relative suitability of each type of development with respect to the surrounding roadside area. The third level, based on the smallest data set, produced reasonable agreement with the second level but less agreement with the full data set.

An assessment tool that requires the full set of 33 contextual features is likely to be impractical for statewide use. Data about several of these features are not currently collected by MDOT, and gathering the data manually for regular use of the framework would require too much time. To balance accuracy with time considerations, researchers recommended using data about the 21 contextual features widely available statewide in building roadside suitability assessment models.

Value

This project represents a first step in improving MDOT's ability to leverage readily available data for early identification of roadside issues and better understand the potential resources and affected stakeholders along a corridor. This landscape-level approach will help MDOT identify functions, limitations and opportunities when handling requests for nontraditional development in roadside rights of way. A centralized, holistic management plan has the potential to be more efficient than the department's current approach, saving money and improving consistency in decision-making statewide. In addition, the project highlights the need for coordination among the many stakeholders involved in land-use decisions.

Research Administration

Principal Investigator

Timothy J. Gates, Ph.D., P.E., PTO
Associate Professor
Department of Civil and Environmental Engineering
Wayne State University
Detroit, MI 48202
tjgates@wayne.edu
313-577-2086

Contact Us

PHONE: 517-636-4555
E-MAIL: mdot-research@michigan.gov
WEB SITE: www.michigan.gov/mdotresearch

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