



Scan Team Report  
 NCHRP Project 20-68A, Scan 10-01

# Best Practices For Risk-Based Forecasts Of Land Volatility For Corridor Management And Sustainable Communities

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# Executive Summary

## Introduction

**I**ncreasingly, federal initiatives for transportation funding are encouraging the development of land use and transportation facilities in a coordinated manner<sup>1</sup>. The ability to preserve multimodal corridors, through advanced right of way (ROW) acquisition and other methods while also providing efficient access for the desired economic growth of many communities, is an emerging concern. This leads to a critical need for transportation agencies to evaluate and implement best practices in both the forecasting of land use and complementary corridor management practices. An innovative and unique reframing of this topic is evaluating uncoordinated land use as a source of risk to the performance of multimodal transportation corridors in the course of planning, programming, and funding project delivery.

Regional planning organizations and local governments encourage economic growth and land development while simultaneously protecting existing and future corridors and promoting sustainable economic development. Such growth often increases traffic demand on existing highways in the region and, at the same time, makes it more difficult to secure public ROW to provide for the increasing highway demand.

The deferral of advanced and/or concurrent addressing of road improvements resulting from land use development may present compounding societal costs, including higher ROW acquisition costs along with decreased corridor travel times, congestion, and safety concerns. On the other hand, reserving or acquiring land for future highway corridor expansion in anticipation of future demand presents a societal risk, as the land is no longer available for development, funding is obligated, and these actions may appear imprudent if growth does not occur as anticipated. Some transportation agencies have sought to understand the business risks associated with ROW and other land acquisition to support decision-making regarding the preservation of corridors that are predicted to experience increasing travel demands.

This report identifies and reviews analytical processes, methods, and tools that metropolitan/transportation planning organizations (MPOs/TPOs), departments of transportation (DOTs), and other agencies could use to address the following interrelated needs:

- Identifying corridors that may experience capacity issues due to development
- Addressing capacity issues in the development of long-range corridor plans

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<sup>1</sup> HUD-DOT-EPA Interagency Partnership for Sustainable Communities, Environmental Protection Agency, <http://www.epa.gov/dced/partnership/index.html> (accessed April 26, 2011)

- Assessing the factors that contribute the most to the risks of undesired land uses related to volatile land use and the potential increased demand on the transportation system
- Forecasting land use changes and the associated demand on the transportation facilities by means of methods, models, and data analyses
- Integrating land use forecasts into transportation planning and capital programming with a multiyear horizon

The scan team met with DOT and MPO officials and others involved in state and regional transportation planning and local land use to identify best practices in problem framing, predictive modeling, gathering expert opinion, and using maps and other data to identify changes in potential land development. The findings and recommendations are in several key topic areas, including:

- Forecasting corridor development
- Understanding how transportation systems are influenced by land development
- Prioritizing funding allocations to maximize the beneficial economic effects of land development
- Protecting corridors and communities
- Protecting existing corridors to ensure the facility's function

The following summarizes some general observations.

- Effective corridor management and risk management address the planning goals and expectations of local government, recognizing the various arenas in which these government officials operate.
- The uniqueness of local conditions can be leveraged to enhance the economic development opportunities in the area.
- The ability to identify when real-estate acquisition or other functions/actions should be triggered based on corridor preservation modeling tools. These tools may prove beneficial in a comprehensive approach to economic development. The need to employ such tools extends across both developed and undeveloped areas.
- Agencies must consider what effective actions can be taken in lieu of expending agency funds in the near term, saving public funds in the long term. Furthermore, agencies should distinguish among the 10- to 30-year planning horizons and the five-year construction or maintenance program's horizon.

The team's review of selected existing processes, methods, and tools supports a selection and integration of analytical methods that are appropriate for local conditions. The results will enable planners to compare, prioritize, and benchmark needs for risk management of land

development that is adjacent to transportation corridors. These results can be used to advance nationwide Federal Highway Administration (FHWA) initiatives (e.g., the HUD-DOT-EPA Partnership for Sustainable Communities<sup>2</sup>) by lowering construction and operations costs, promoting reliable access to employment, and leveraging federal policies.

## Purpose and Scope

The scan's purpose was to investigate how MPOs, DOTs, and other agencies have used organizational processes, analytical methods, and data-management tools to address the following issues:

- Identifying corridors that may experience capacity issues due to development
- Addressing capacity issues in the development of long-range corridor plans
- Assessing factors that contribute most to the risk of adjacent land use
- Forecasting land use changes and the associated demand on the transportation facilities by means of methods, models, and data analysis
- Using methods, models, and data to forecast land uses adjacent to transportation facilities
- Integrating land use forecasts into transportation plans with a multiyear horizon

The scan participants represented localities, MPOs, economists, state-level DOTs, and researchers with experience coordinating land use planning and transportation. The states surveyed included California, Florida, Georgia, Louisiana, Minnesota, Montana, North Carolina, Pennsylvania, Utah, Virginia, and Washington. The results also include key findings from the scan team members' states: Arizona, Michigan, New Jersey, Oregon, Virginia, and Washington. The scan addressed framing problems, using predictive modeling, gathering expert opinion, using maps and other data to identify potential development, and using procedural/methodological support for corridor management.

## General Findings and Observations

The scan identified processes, methods, and tools that are currently in use and available to be integrated, appropriate for local conditions, for corridor management and risk management. Among other findings, a risk-based approach to corridor preservation was developed as the Virginia DOT Access Control Prioritization System (ACPS) and the Virginia Land Development Forecasting and Prioritization System (VLDFPS). Other processes, methods, and tools can complement and supplement a risk-informed approach.

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<sup>2</sup> HUD-DOT-EPA Partnership for Sustainable Communities,  
<http://www.epa.gov/smartgrowth/partnership/index.html>

The scan identified the significant benefit of partnerships among leaders of a region at multiple levels. Areas embracing common goals and working in a partnership with coordination and cooperation among several levels of governance were able to manage the risks of land use changes for their transportation corridors more effectively. Agencies such as the Pennsylvania, Georgia, and Florida DOTs encourage coordination by means of data sharing and interactive databases. Agencies such as the Montana and North Carolina DOTs encourage coordination through Memoranda of Understanding (MOU) with local agencies.

Several sites the scan team visited are engaged in proactive, multi-stakeholder initiatives for land use by promoting an agreed-upon desired land use and performing advanced ROW acquisition. The Metropolitan Council of the Minneapolis-St. Paul metropolitan area, the Utah DOT, and the Washington State DOT are progressive for managing advanced ROW acquisition programs through use of a ROW revolving fund.

Pennsylvania DOT's guidance manuals and its State Smart Transportation initiative both incorporate sustainability principles. Programs such as the Atlanta Regional Commission's (ARC's) Livable Centers Initiative (LCI), the Sacramento Council of Governments' (SACOG) Sustainable Communities program, and the New Orleans Regional Planning Commission's (NORPC's) Complete Streets initiative have developed sustainability programs to fit the unique conditions of their areas.

A few innovative tools for increased objective and automated modeling of the transportation and land use system include the Florida DOT's Florida Standard for Urban Transportation Modeling Structure (FSUTMS) and Alternative Analysis Research Tool (AART), and Montana DOT's Highway Economic Analysis Tool (HEAT).

It remains a challenge for DOTs and regional planning organizations across the U.S. to:

- Select and assemble from the above-identified methods an effective and appropriate solution for corridor preservation and management
- Monitor and evaluate the success of such initiatives to reduce costs/resources and gain efficiencies
- Address current and future funding constraints

## Recommendations

A comprehensive analytical process for corridor management may not have been realized yet in any region/state of the U.S. Nevertheless, individual DOTs and MPOs exhibit worthy efforts to address the issue. They have identified components of the methodology that will likely eventually be part of such a comprehensive approach. This scan identifies the components/features that reflect the special conditions and needs of their respective regions, states, and localities, as well as multiple attempts by various states, MPOs, and other planning organizations to address the issue and satisfy the need to manage the risk to existing and future corridors. Individual DOTs and MPOs are encouraged to identify and adopt relevant

components that can be applied to their evolving comprehensive corridor management approaches.

An integration of analytical methods will be unique to local conditions, including available funding, political support, leadership, and commonality of goals. Agencies and regional organizations should consider the following processes, methods, and information tools as they move toward an integrated approach to corridor management:

- Monitoring/tracking of key decision points across agencies and stakeholders, by need and by project, as implemented by Florida DOT
- Systematically documenting purpose, need, existing land use, potential environmental impacts, and narrowing of potential alternatives during the program-development process, as implemented by Pennsylvania DOT
- Coordinating with localities and sharing databases for land use and transportation facilities, as implemented by NORPC
- Systematically documenting and reviewing factors that may impact project scopes, schedules, and budgets prior to a project being programmed on a Transportation Improvement Plan (TIP), as implemented by Pennsylvania DOT
- Educating local authorities and citizens about the factors involved in land use and transportation, as implemented by Montana DOT
- Balancing transportation innovation with the memory/recovery of legacy communities and facilities through data collection and analysis, as implemented by NORPC
- Analyzing the risk of adjacent land development, considering the current densities of access points, forecasts of land development, and current and forecasted travel demands, as implemented by Virginia DOT
- Prioritizing and filtering needs for near-term, mid-term, and long-term action of planners, developers, and citizens, as implemented by Virginia DOT

The details of particular processes, methods, and information tools that support the above summary are provided in the body of this report.