

Experience of Other States and Regions in Incorporating Land Resource Considerations into Transportation Planning

■ Introduction

This appendix reviews the practices of selected state DOTs and other agencies who are incorporating land use and land resource issues into transportation planning at the state-wide and metropolitan levels. While the review is not comprehensive, it does provide a broad sampling of recent state activities. The review finds that many state DOTs are increasingly addressing not only the direct land resource and environmental impacts of transportation projects, but also the indirect impacts of these projects on development patterns. Their activities are taking many forms, including:

- Earlier consideration of land resource issues in the transportation planning process, including long-range planning and the examination of secondary and cumulative impacts;
- Developing geographic information systems (GIS)-based data to support the analysis and mitigation of land resource impacts;
- Developing analytical tools to assess secondary and cumulative impacts, including land use impacts, in corridor and systems-level planning;
- Providing technical assistance and/or financial resources to local communities to better consider transportation issues in their local comprehensive planning processes;
- Directly working with communities on land use issues related to corridor planning/preservation and access management;
- Reducing or mitigating the impacts of projects through strategies such as wetlands banking, purchase of development rights, and context-sensitive design; and
- Adopting environmental stewardship practices in operations and maintenance.

This appendix also briefly reviews approaches taken by metropolitan planning organizations (MPO) and states to incorporating land use issues into metropolitan transportation planning. The result is a base of experience upon which INDOT can build in taking actions to better integrate land resource considerations in transportation policy and planning decision-making.

■ Data and Geographic Information Systems

North Carolina: Environmental GIS – North Carolina DOT’s statewide transportation systems planning process incorporates environmental considerations and is supported by GIS data that conveys site-specific environmental information. The process includes specific early involvement by the regulatory/resource agencies who are responsible for safeguarding environmental, cultural, and historical sites. The goal of this approach is to address major environmental issues early in the transportation systems planning process, in order to identify and gain consensus on the most environmentally acceptable corridor for each system improvement to be included in the systems plan and future STIPs.

Source: FHWA. *Case Study #3: NCDOT: Use of GIS to Support Environmental Analysis During System Planning*. Transportation Case Studies in GIS, September 1998.

Tennessee: Statewide Land Use Database – The Tennessee Department of Finance and Administration is sponsoring the development of a statewide parcel-level GIS land use database. Digitized images from EarthData’s aerial photographic studies are being matched with digital linework and symbology representing individual parcels, roadways, bodies of water, and other map features. The parcel graphics will be logically linked to the non-graphic data, giving the State a visual index to property information such as deed description and acreage, ownership, assessed value, and proximity to features such as schools, industry, churches, utilities, roads, and bodies of water. The project was initiated in 2000 and will take five years.

Source: <http://www.sds-inc.com/tenn.htm>

Maryland: Statewide Land Use Database – The Maryland Office of Planning assembled a statewide GIS land use database, including data such as land classification, zoned densities, amount of land recently developed, and amount of land available for development. The office also sponsored the development of analytical tools for looking at watershed and other environmental impacts resulting from land use changes, and has done exploratory work with the Maryland DOT to link transportation with land use and environmental models.

Utah: Data for Regional Planning – The Utah Governor’s Office of Planning and Budget provided financial resources and technical assistance to develop databases and modeling tools for growth scenario analysis in the 10-county northern Utah region. From a land use standpoint, this effort involved the consolidation of comprehensive plan land use data from over 90 jurisdictions into a single GIS database; a workshop-based public process for creating alternative land development scenarios along with different transportation scenarios; and

modeling the transportation impacts and infrastructure costs of these regional land development scenarios. Further work is underway to develop a land use model for the region.

Source: FHWA Toolbox for Regional Policy Analysis. <http://www.fhwa.dot.gov/planning/toolbox/index.htm>

■ Analytical Methods

Michigan: Quantitative Modeling of Land Use Impacts – For the U.S. 31 Study between Holland and Grand Haven, Michigan, the Michigan DOT undertook a major analysis of secondary and cumulative impacts, which were of significant concern to local communities. The study consultants included the Geography Department at Michigan State University, which led the land use modeling for this project. The study looked at the impacts of different levels of connectivity to the system. The construction of some interchanges is contingent upon local jurisdictions implementing zoning to protect farmland and restrict growth.

Maryland: Qualitative/Expert Panel Forecasting – The Maryland Department of Transportation and Office of Planning sponsored the development of qualitative, expert panel-based approaches to forecasting the potential land use impacts of transportation projects. These approaches have been used in conjunction with Maryland 301, a proposed suburban cross-county connector in the Washington, D.C. area; corridor alternatives for I-270 outside of Washington, D.C.; and a proposed widening of a two-lane highway to four lanes west of Baltimore. These approaches have been assisted by the extensive GIS land use database assembled by the Office of Planning. Expert panels also have been used by the Wisconsin and Washington State DOTs.

Oregon: Transportation/Land Use Modeling – Oregon DOT has developed a statewide transportation and land use model. The model is grid cell-based to allow for integration of data at different levels of spatial aggregation. The model permits the assessment of land use and economic impacts of major transportation improvements.

Source: Oregon DOT web site, <http://www.odot.state.or.us/tddtpau/modeling.html>

Quantitative population and employment allocation models have been applied by state DOTs to assess the land use impacts of transportation corridor projects in Rochester, New York and Winston-Salem, North Carolina.

■ Assistance with Local Comprehensive Planning

Wisconsin – Via legislation adopted in 2000, the state has required communities to perform comprehensive planning. The state also is providing grants to assist communities with planning that encourages “smart growth.” Grants are available specifically for transportation planning (transportation element of the plan) as well as for general planning.

Aid also is offered for communities with adopted plans meeting certain smart growth criteria. Legislation provides model ordinances for traditional neighborhood developments and conservation subdivisions.

In support of this initiative, the Wisconsin DOT developed resources for agency staff and local communities to better incorporate transportation issues into comprehensive planning. In 2001, WisDOT published a *Transportation Planning Resource Guide* that is intended to assist local communities in the development of the transportation element of local comprehensive plans. The resource guide covers topics such as needs assessment, local transportation plan development, consideration of transportation needs from a regional perspective, transportation-land use relationships, access management/corridor planning, environmental impacts, implementation and funding, coordination with stakeholder agencies and groups, public participation, state and regional agency contacts, and further resources. This guide is located on their web site along with other information on local government programs and on transportation-land use coordination.

WisDOT also created guidance for its district staff on participating in local comprehensive planning. The guidance acknowledges that what local governments include in their plans will directly impact WisDOT's work and efforts, and encourages staff to reach out to communities

Source: Wisconsin Department of Administration, Office of Land Information Services.
Wisconsin's Comprehensive Planning Legislation. September 24, 2001.
<http://www.doa.state.wi.us/olis/>
<http://www.dot.state.wi.us/localgov/land/index.htm>

Pennsylvania – PennDOT has developed a Sound Land Use Implementation Plan to establish policy for the department. The plan discusses actions under three categories: educating agency staff, incorporating local land use planning into agency decisions, and identifying actions likely to have a significant effect on land use. As one component of this plan, PennDOT provides funds on a competitive basis for studies that coordinate transportation and land use, providing over \$600,000 in FY 2001-2002. Other actions taken under the Sound Land Use Implementation Plan include providing training to district staff on land use planning, applying context-sensitive design principles, hosting conferences on land use and transportation, and integrating land use planning issues into corridor studies.

Source: <http://www.dot.state.pa.us> → General Information → Land Use

Delaware – The Delaware Department of Transportation (DelDOT) has developed a Corridor Capacity Preservation Program. The types of corridor access desired are based on area type (five statewide categories). For example, reinvestment is encouraged in existing developed areas and designated growth areas. DelDOT is using Purchase of Development Rights (PDR) to direct development, limit access, and preserve capacity, and works with town working groups to discourage the subdivision of properties in areas where growth is deemed undesirable.

North Carolina – The NCDOT has developed Traditional Neighborhood Development (TND) design guidelines that supersede standard subdivision design guidelines in designated

TNDs. These can be customized and adopted by local communities as a way of reducing the potential transportation impacts of new development.

Source: <http://www.doh.dot.state.nc.us/operations/>

■ Corridor Planning and Access Management

Kentucky: Integrated Corridor Planning Approach – The Kentucky Transportation Cabinet (KYTC) developed an outreach-oriented corridor planning process that includes working with local jurisdictions on land use planning issues. Their involvement was motivated by concerns that corridor improvement projects on the fringes of metropolitan areas would lead to strip development and urban sprawl. For one project in Bowling Green, KYTC worked with the city and county planning and zoning commission and other stakeholders to create an overlay district specifying allowable uses, building design, and landscaping features. KYTC also implemented access controls along the new roadway alignment.

Source: Federal Highway Administration. TCSP Case Study #11

Access Management – States that have implemented various forms of access management programs include (but are not limited to) Colorado, Florida, Maine, Michigan, Minnesota, Montana, New Jersey, Ohio, Oregon, South Dakota, and Wisconsin. For example, the Michigan and Ohio DOTs have developed manuals and training programs on access management. In Michigan, the training program was developed by a zoning consultant and is intended to assist township/local government officials with adopting ordinances to protect right-of-way and highway access.

Sources: Center for Urban Transportation Research. *Access Management Manual*. Developed for FHWA with oversight by TRB Access Management Committee. Scheduled for publication in spring 2003.

The TRB Access Management Committee also has a CD-ROM library of access management documents and proceedings of conferences. See: <http://www.accessmanagement.gov/>

Michigan: Noise Program – As part of a noise program, Michigan DOT is beginning to work with communities to implement setbacks in order to keep growth from bordering too close to the right-of-way, and therefore minimize future needs for noise reduction or conflicts from community noise problems.

■ Impact Mitigation

Wisconsin: Purchase of Development Rights – To reach agreement on a long-stalemted proposal to widen U.S. Highway 12 north of Madison, the Wisconsin DOT agreed to contribute funds for the purchase of land, easements, and development rights in sensitive natural areas in the corridor. The DOT also is providing funding to help local communities plan for growth related to the highway.

Pennsylvania: Secondary Impact Assessment – A corridor study of Pennsylvania 23 in Lancaster County led to the undertaking of a study of the cumulative effects of transportation and urban sprawl on the Mennonite/Amish communities. The study, led by PennDOT and the Lancaster County Planning Commission, proposed land use and transportation actions to lessen the cumulative effects on these communities. As part of the Pennsylvania 23 EIS (underway), PennDOT organized a two-day Land Use Visioning Conference to review past and current land use practices and predict future trends in land use.

Source: <http://www.paroute23.com/>

Context-Sensitive Design – A number of state DOTs, including Connecticut, Kentucky, Maryland, Minnesota, New Jersey, New York, Utah, Vermont, and Washington, are adopting context-sensitive design principles for highway construction and reconstruction projects. Context-sensitive design can improve the capability of transportation facilities with adjacent land uses, especially in areas of significance such as older community centers and scenic and natural areas. This concept is now being broadened to Context Sensitive Solutions, encouraging application of the same principles throughout the transportation planning process.

Source: <http://www.fhwa.dot.gov/csd/index.htm>

Wetlands Mitigation – A number of states have established wetlands assessment and mitigation techniques. See NCHRP Synthesis Report 302, *Mitigation of Ecological Impacts*.

■ Environmental Stewardship

Several state DOTs have implemented environmental stewardship practices in operations and maintenance. For example, the New York State DOT has published their own environmental handbook addressing environmental issues in the roadside. The Utah DOT is very experienced in dealing with invasive species. The Oregon DOT has successfully formed interagency partnerships and is a leader in restoration of native grasses. The Iowa DOT is recognized for its prairie passage program, an environmentally related public awareness program, and their roadside trust, and Florida requires weed free sod in construction and reconstruction.

Sources: New York State DOT – *Environmental Handbook for Transportation Operations*
NCHRP Synthesis Report 305 – *Interaction Between Roadways and Wildlife Ecology*

■ Other State Programs and Activities

Local Aid - The Illinois DOT has sponsored a state “Transportation and Community and System Preservation” (TCSP) program, modeled after the Federal TCSP program, which provides grants to communities to undertake projects that address transportation and land use in an integrated manner and reduce transportation impacts on the environment.

Systems Planning - Wisconsin DOT has included a qualitative discussion of secondary and cumulative impacts (including land use impacts) of recent statewide long-range transportation plans, as part of their social, economic, and environmental (SEE) impact assessment of these plans (including plans for each mode as well as an overall systems policy plan).

■ Metropolitan Systems Planning

Portland, Oregon and Honolulu, Hawaii have developed transportation-land use models (UrbanSim) that allow for the testing of alternative transportation investments on regional growth and land use. Similar models are under development in Baltimore, Salt Lake City, and Seattle. Less sophisticated accessibility-based models (e.g., DRAM EMPAL) have been applied for many years in a number of other metropolitan areas, sometimes being used to test the impacts of transportation investments on land use. Models have been developed or applied by research agencies in New York City and Sacramento, California.

MPOs or regional nonprofits in Charlottesville, Virginia; Denver, Colorado; Gainesville, Florida; Lansing, Michigan; Portland, Oregon; Seattle, Washington; and other cities have led regional visioning processes, in which alternative growth scenarios are defined and their impacts modeled. Typically, three or four alternative land use and transportation scenarios are constructed through an extensive stakeholder and public involvement/outreach process. Their impacts are then modeled using the regional travel demand model. State DOTs have been involved in some of these efforts in the form of providing technical input on modeling activities.