

CASE STUDY SUMMARY

This case study summary report is part of a larger study sponsored by the Oregon Department of Transportation (ODOT) to help it assess the land use impacts of future highway projects. Major highway improvement projects that ODOT undertakes require environmental analysis, which in turn require an assessment of the improvements on land use. The study consists of three research components and a guidebook. The three research components are:

- *Literature Review.* Review of state and national studies to summarize empirical estimates of the relationship between highway and land use change, especially at the urban fringe. (Appendix B)
- *20-Site Analysis.* Analysis of historical aerial photographs and highway maps to show the association between highway improvements and land use changes over 20 years in 20 Oregon cities. (Appendix C)
- *Case Study Analysis.* More detailed analysis of highway projects and land use changes in six Oregon cities.

The case studies evaluate the impacts of major improvements to state highways at the urban fringe [primarily inside, secondarily outside, urban growth boundaries (UGBs)]. Six case studies were completed for this project: five for highway widenings (Albany, Bend, Corvallis, Island City/La Grande, and McMinnville) and one which was partially a widening project and partially construction of a new alignment (Grants Pass). Copies of individual case study reports of the detailed analysis for each case study are available from the ODOT Research Group.

Figure D.1 shows how the elements of this study fit together to address the study objectives.

Purpose of this Report

There are many questions about the relationship between transportation improvements and land use change that ODOT or other transportation agencies might want answered. It is important to

be clear about which ones this study addressed. The purpose of this report is to summarize the results of six case studies that researched whether there is any evidence that ODOT projects completed after 1985 caused land uses to change from what adopted plans at that time envisioned and apparently desired. That question is relatively narrow and ignores a number of broader questions that were outside of the scope of the case study research.

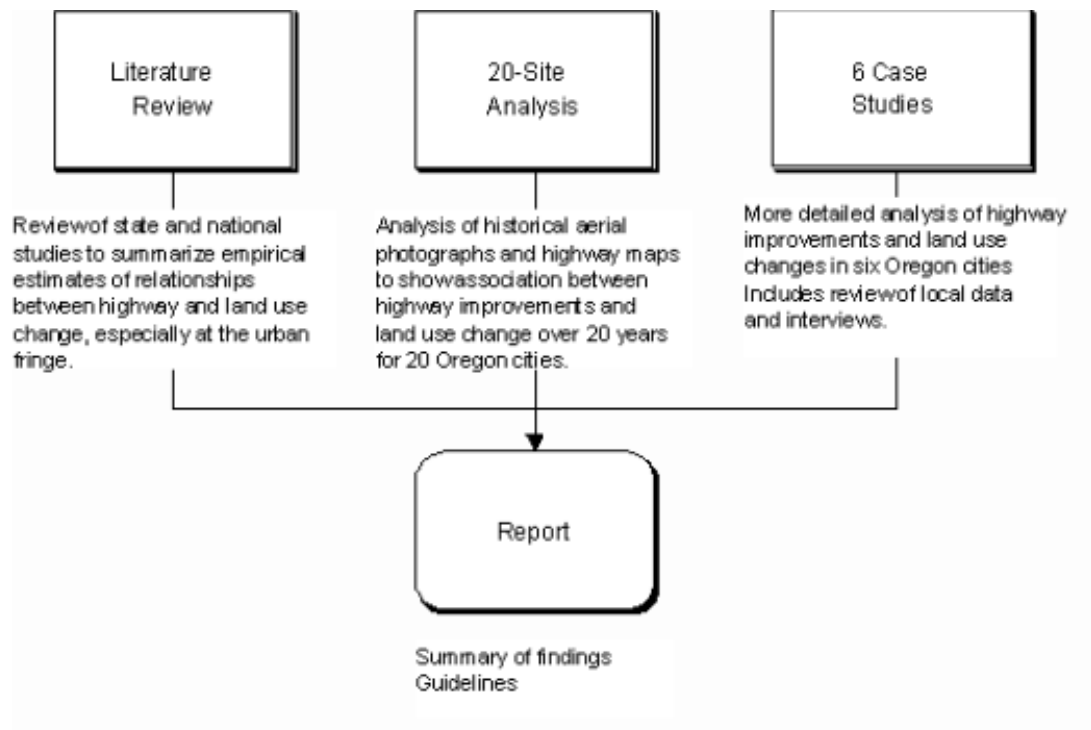


Figure D.1: Structure of the Research

Two general questions that were *not* the focus of the case studies but help establish context:

Is there any evidence that highway projects in the United States, anywhere at any time, have had impacts on land use? The professional literature clearly answers "yes."

Is there any evidence that that highway projects in Oregon, anywhere at any time, have had impacts on land use? Observation indicates the answer to this question is also "yes."

The fact that at some time in the past, in some places, for some type and scale of projects, highways have had impacts on land use, does not provide a basis for assessing the extent of the effects of a specific project. Today's transportation projects are usually small improvements to part of a large and ubiquitous network of highways and streets. Fifty (or even 30) years ago one could find new highways (e.g., the interstate system) that vastly increased access to large areas of land. Today, large projects opening up new areas to development are rare. Projects are typically improvements to existing paved highways; improvements that are usually less than a couple of miles long, providing marginal improvements in safety and travel time, and no new access.

The two preceding questions contrast with the ones that follow, which focus on the case study projects which occurred after 1985. The contrast is critical for at least two reasons: (1) most of the urban areas and highways in Oregon were well established by 1985; interstates and state highways had been completed – any single highway project would have had a proportionately smaller effect on travel, congestion, and land use; and (2)

local land use plans based on statewide goals were all in place as of 1985; the desired/predicted pattern of growth through the year 2000 (what we see today) may have already been on the comprehensive plan and/or zoning map in 1985. Thus, three more specific questions were posed for the case study analysis; only the first one (in bold) was addressed by the research:

Is there any evidence that ODOT projects completed after 1985 caused land uses to change from what adopted plans at that time envisioned? This question was the focus of the study. The ODOT Environmental Services Section is responsible for the preparation of Environmental Assessments (EAs) and Environmental Impact Statements (EISs), which must include an analysis of land use impacts, and more specifically, indirect land use impacts. The analysis of indirect (secondary) impacts is often framed this way. It is particularly important in Oregon, where state land use law requires state transportation improvements to be identified in local land use plans. If the improvements are likely to facilitate land use change different from what the plan envisions, then either the improvement or the plan must be changed.

A related question is whether ODOT projects completed after 1985 caused development to occur faster than they would have without the project or faster than planned rates.

- Is there any evidence that prior ODOT highway investments influenced the land use plans that were adopted in the 1970s and 1980s in response to state mandates? While interesting, this question is outside the scope of the case study analysis. When adopting and updating their land use plans, local governments certainly look at where roads are and where they are able and likely to go. In that sense, the prior and expected investments of ODOT influenced the *plan* for future land development. If the plan then influenced development, as Oregon law says it should and most planners believe it does, then the logical inference is that land use in Oregon today would be different if ODOT and local governments had made different highway investments. This conclusion is not much help to planners who need to describe the impacts of improvements to existing highways.
- Is there any evidence that ODOT's recent and new highway improvements allow (and are a necessary condition for at least some of) the development envisioned in local land use plans? While this question is not the focus of the case studies, some data and analysis on this topic is included.

As described above, a *marginal* analysis was conducted to evaluate how land use changes associated with a highway improvement are different from changes that would otherwise occur, given the rest of the transportation network and the public sector expectations and desires for land use development as embodied in their required comprehensive plans.

Methods

As with most policy research, the intent of this case study is to be able to isolate the impacts (the effects) that are uniquely attributable to a change in public policy. Figure D.2 illustrates the concept. The shaded box represents a world that does not exist but one that an analyst must somehow describe. It is a world that *would have* existed but for the introduction of the new policy. As it relates to the case studies, the highway improvement

was the policy. The case studies document, to the extent the data allow, what happened after that policy (box on bottom right). Describing what *would have happened* without the improvement (the shaded box) is more speculative. As applied to the case studies, the method does not formally define a hypothetical world and compare it to an actual one. Rather, it relies on expert opinion about the contribution of the project to the changes observed between "Existing Conditions" (at the time the EIS or EA was completed) and the "Actual World" (2000). The methods we used were consistent with a case study approach, which is an *ex post* evaluation of indirect land use effects.

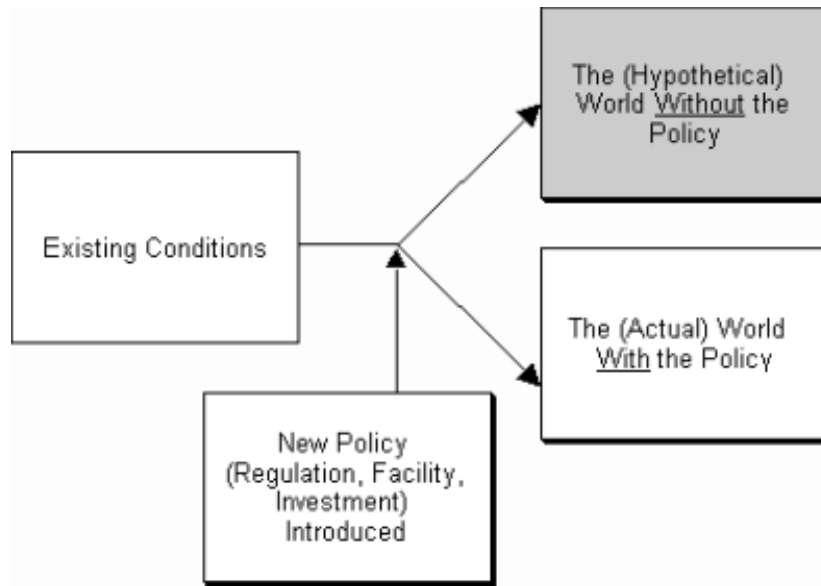


Figure D.2: Case Study Method, in Concept

The Council on Environmental Quality (CEQ) regulations describe requirements of the National Environmental Policy Act (NEPA). The CEQ defines indirect land use effects as follows:

Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

The methods used for the case studies were both quantitative and qualitative. Sources for the description of existing conditions before the highway improvement include:

- EISs or EAs for the case study project;
- Local Comprehensive Plans and zoning ordinances;
- Transportation system plans;
- Interviews with city/county staff and other knowledgeable persons; and

- Other planning-related documents.

The case study methods used the following sources to describe changes in land use:

- County property tax assessment data to identify the location, timing and value of residential development;
- Building permit and development data;
- Maps showing city limits, urban growth boundaries (UGBs), and zoning/land use designations at various times; and
- Planning documents that show changes in land use and public policy.

Each case study included a focus group to assist with a qualitative assessment of changes associated with the transportation project. The focus groups generally consisted of city staff, county staff, ODOT staff, and local developers or realtors. The purpose of the focus group session was to get comments on the preliminary conclusions made from review of secondary data sources, and to gain insights into the public policy decisions and market factors that contributed to the observed development patterns. Table D.1 summarizes the projects analyzed in the case studies.

Table D.1: Summary of Case Study Projects

CITY	DATES	TYPE OF PROJECT	DESCRIPTION
Albany	Draft EIS–1983 Final EIS–1985 Project completion– Phase I: 1988 Phase II: 1994	Widening	Widening of OR Highway 99E (Albany–Junction City Highway) from Queen Avenue on the north to OR Highway 34 (at Tangent) to the south. The project improved a 5.5 mile section from two to four lanes, with a continuous left-turn median.
Bend	EA–1987 Project completion– 1991	Widening	Widening from two to four lanes of a 2.2 mile stretch of US Highway 97 (The Dalles-California Highway) from milepost 132.6 on the North (about 0.5 miles north of the Smalley Road/US 97 intersection) to the Highway 97/Highway 20 connection at milepost 134.8. The project was called the Bend-Redmond South Unit.
Corvallis	EA–1985 Project completion– 1992	Widening	Widening of a 2.2 mile section of OR Highway 99W (Pacific Highway West) from the Mary’s River on the north to Kiger Island Drive on the south (this stretch is also known as South Third Street).
Grants Pass	Draft EIS–1978 Final EIS–1979	Widening/new alignment for third Rogue River bridge	Construction of a third Rogue River crossing in the Grants Pass area. The project is a 2.1 mile section of highway known as the Grants Pass Parkway.

	Project completion–1991		
Island City/ La Grande	EA–1986 Revised EA–1987 Project completion–1992	Widening	Widening a 1.42 mile section of OR Highway 82 (Wallowa Lake Highway) from approximately 1/4 mile east of the I-84 interchange (M.P. 1.20) to the Grande Ronde River bridge at the northern city limits of Island City (M.P. 2.62). The project widened an existing two-lane highway to five lanes from the beginning of the project to the intersection with the Cove Highway (Hwy. 237) in Island City, and to a three-lane roadway from that point to the Grande Ronde bridge.
McMinnville	EIS–1985 Project completion–1993	Widening	Widening of OR Highway 18 (Salmon River Highway) from the East McMinnville Interchange on the west to Airport Road on the east (this stretch is also known as Three Mile Lane). The project improved a 2.2 mile section from two to four lanes, with a continuous left-turn median.

Source: Case Study Reports, ECONorthwest, 2000

General Patterns and Trends from the Six Case Studies

There are only six case studies, so any generalizations have to be made cautiously. But the small sample is remarkably similar on a few key points. **All the case studies illustrate that the development that occurred after the highway improvement was generally consistent with the development envisioned in local plans before the improvement.** In other words, the highway improvements, at most, facilitated making the expectations or hopes about future development a reality.

The one exception to this finding is that the Wal-Mart built in Island City required several infrastructure improvements not identified in local plans, or not included in capital improvement programs. While the site adjacent to Highway 82 was designated for commercial uses, the plan did not anticipate a development of this magnitude. The cities of La Grande and Island City partnered with Union County and ODOT to make needed transportation and infrastructure improvements.

All the case studies illustrate that interactive, iterative, and incremental nature of most urban development. The plan says what kind of development is wanted or acceptable; the highway improvement facilitates that development. But the plan may be what it is in response to past highway improvements, and future plans may change in response to the way that current plan gets implemented. The case studies all paint a picture of incremental and iterative decisions: small changes in land use plans and highway improvements, each responding to previous changes in land use and transportation.

In all of the case studies, the land use pattern in the study area was established prior to the highway improvements. Moreover, all of the jurisdictions had plans or policies that recognized and supported the case study highway improvements.

The case studies support the hypothesis that the scale of land use change will correlate with the scale of the improvement to accessibility. Where access already existed (as in all of the case studies), widenings did not cause any obvious changes in the type of development.

None of the highway improvements could be directly correlated with annexations or UGB expansions. Moreover, with two exceptions (in Bend and Island City), no zone or plan designation changes occurred in the study areas.

In two of the case studies, however, evidence was found that suggest that the improvements may have influenced the rate of development. In Bend and Corvallis we found increased rates of development in the study areas after the improvements were completed. It appears, however, that a strong economy and other site specific factors (availability of infrastructure, visibility) were significant factors in the rate of growth. In other words, we were unable to attribute the increased rates of growth directly or completely to the highway improvements.

Other important findings from the case studies include:

- **Good accessibility is a necessary but not sufficient condition for local development.** Some of the case studies illustrate what is common knowledge among planners and developers: the amount development responds to the availability of other key public facilities (especially water and sewer) and their costs (including how such facilities will be funded and who will pay for them).

This was particularly important in Albany and Island City. In Albany, the lack of sewer and water capacity south of Oak Creek was a major limiting factor on development. In Island City, the four jurisdictions (LaGrande, Island City, Union County, and ODOT) worked together to develop infrastructure needed to accommodate the Wal-Mart store.

- **In all of the case studies, development of all types was dispersed throughout the communities.** Those development patterns were also envisioned by local comprehensive plans.

While some of the study areas contained the majority of commercial or industrial land, in all of the case studies all types of development were dispersed among the appropriate zones.

- **All of the case study highway improvements were completed in the late 1980s or early 1990s, mostly before Oregon's economic boom in the 1990s.** All of the case study communities had higher growth rates in the 1990s than in the 1980s. Thus, while substantial development occurred after the highway improvements, the growth cannot be solely attributed to the influence of the improvements.

- **As implemented by counties, state policies that restrict development of resource lands have been effective in limiting development associated with highway improvements outside UGBs.** The case studies did not identify any major new developments outside UGBs.

Finally, a few words of advice with respect to the study objective to create information that ODOT could use when assessing the potential indirect impacts of proposed highway improvements on land use. One caution is the potential for confusion caused by saying that a highway project "creates or causes changes in land use." As noted before, development will likely occur in areas now served by ODOT highways whether ODOT improves those highways or not. Plans allow and even desire those changes inside city limits and UGBs; other public policies sometimes provide incentives for that growth. Even without the encouragement, market demand could encourage land use change. So the fact that change occurs, by itself, is not evidence that new ODOT improvements significantly contributed to that change.

Thus, "change in land use" must be about some notion of how future land use will be different from what it would have been without the highway improvement. But as the case studies show, ODOT projects were consistent with local plans for development.

A term commonly found in EISs and EAs is that highway improvements may "create pressure for land use change." The bigger the improvement, access benefits, and travel-time savings, the greater the pressure. But when does the pressure become an impact? Apparently, when a comprehensive plan is changed to allow different (probably more intensive) development than the plan previously allowed. Still, pressure is hard to measure. The case studies did not find a lot of petitions for changing plan designations or rezoning. While several annexations and UGB expansions were found in the study areas of the case study cities, it was difficult to directly attribute those actions to the highway improvements. The presence or absence of adequate water and sewer infrastructure, however, played a significant role in whether development occurred in the case study areas.

Moreover, the "pressure" is not that important in and of itself: what matters is whether plans or boundaries are actually changed in response to that pressure. The evidence from the case studies (with the exception of Island City, and the possible exception of Bend) is that they were not. Particularly important is that we found no evidence outside of UGBs of land development that was not allowed by existing plans. Finally, there is the question of whether any change that does occur is, by definition, undesirable. Local plans change frequently; planners and citizens making those changes often believe they are making things better. Plan changes to allow more intense development in areas where public investments have provided facilities to accommodate it may make sense. Growth that occurs sooner or more intensively than forecast, however, may make lead to premature obsolescence of highway improvements.

These six case studies support the conclusion that highway widening projects, by themselves, are not likely to cause changes in land use from what they would have been in the absence of those improvements. The highway improvements may contribute to such changes in land use, but it is difficult to determine the extent of their influence.

Local governments have ample tools to plan and control land use changes with or without highway improvements. The market will respond to the available accessibility. Given sufficient market demand and reasonable land prices, development will occur if public services like sewer and water, and some minimal level of access (i.e., there is a paved road to a site with a curb cut) are available. Highway widenings are unlikely to change what gets developed, but will likely to facilitate whatever development is already allowed. That is not to say that plan designations or zoning will not change in a corridor where a widening has occurred, but based on the six case studies, highway widenings are neither a necessary or sufficient condition to predict whether such policy changes will occur.

The case studies *did* show that land use changes generally were consistent with zoning and comprehensive plan designations. It could not be determined if the growth occurred slower, faster, or at the same rate as envisioned in plans, because few comprehensive land use plans get to that level of specificity. The evidence could be interpreted to suggest that in Island City and Corvallis (and maybe some of the other jurisdictions), growth occurred faster with the projects than it would have without the projects. For example, OR 82 (Island City) and OR 99W (Corvallis) traffic volume increases (which occurred faster than forecast in the environmental documentation), annexations, and/or UGB expansions *may* suggest changes that were greater or faster than expected.

Accepted economic theory for land use and transportation is clear that travel time changes are an impetus for land uses, i.e., the greater the travel time savings, the greater the accessibility, and the greater the propensity for land use changes. Unfortunately, such an evaluation implies analysis of the larger regional context, further complicating the analysis. The changes in a particular corridor may be relatively minor but the increases in congestion on other routes may be so pronounced that minor travel time improvements or even maintaining travel time may result in large changes in regional accessibility for the particular highway improvement. The environmental documentation of the case study projects was generally insufficient to make such determinations.

The evidence from the case studies shows that small ODOT projects will generally have minimal, if any, effects on land use that can be measured and uniquely attributed to those projects.

Each of the six case studies is reported in a separate document, recording the extensive analysis completed as part of this research. These reports were written to stand alone as well as to support the development of the Guidebook for Evaluating Indirect Land Use and Growth Impacts of Highway Improvements. The key findings for each case study are summarized below. Copies of the full reports for each case study are available from the ODOT Research Group.