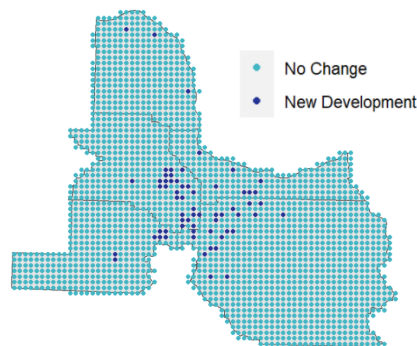# Exploring a Logit Model for Development Demand Predictions : Portland, Oregon MSA
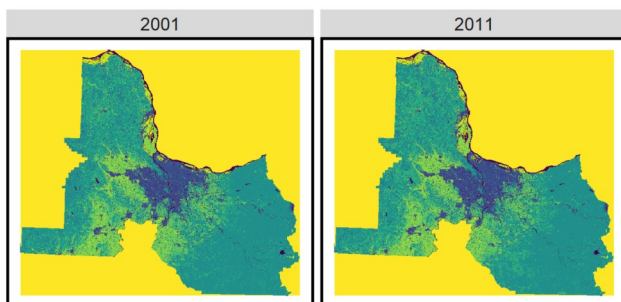
Abstract

Population growth poses a challenge for many cities across the United States. Understanding where population growth will most likely occur is essential in understanding where to locate new development projects, locate public services, alter the zoning ordinance, and where urban growth boundaries should be located. Portland, Oregon, is known for strict development regulations that concentrate the metropolitan region's new development within urban growth boundaries. This study explores where population and development will most likely grow in the Portland Metropolitan Area and by how much.
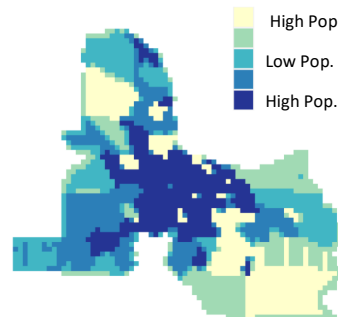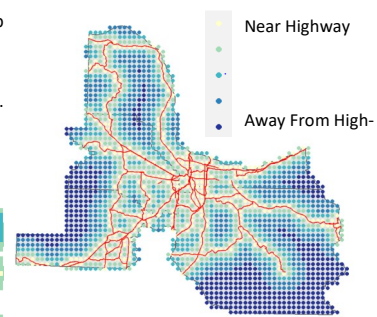
2001—2011 Development Change

- No Change
- New Development
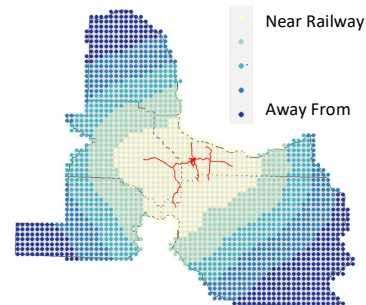
Land Cover—2001, 2011

2001 | 2011

Variables

Population Change

- High Pop
- Low Pop.
- High Pop.

Distance to Highway

- Near Highway
- Away From High-

Distance to Railway

- Near Railway
- Away From

Urban Growth Boundary

- No Change
- New Development
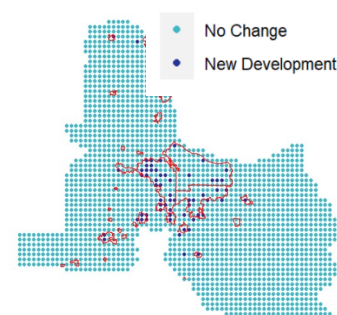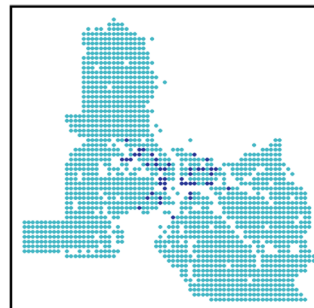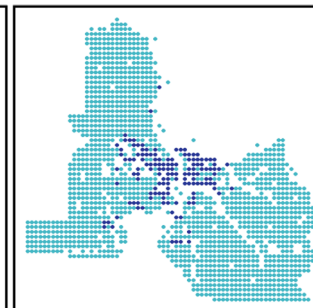
Modeling Technique

Logit Model — Predicting probability of binary outcome ; 1 : Newly Developed ; 0 No Change

### 17% Probability Threshold

5% Probability Threshold

Model Metrics

- **Accuracy—90%**
- **True Positive Rate - (Predicted Development an development occurred) - 76%**
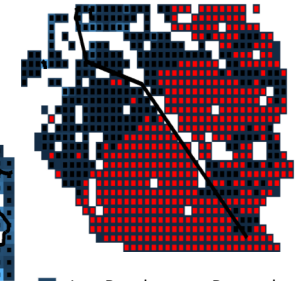- **True Negative Rate—(Predicted No Development and no development occurred) -90%**

High Speed Rail Scenario

Over the past 10 years, there has been talk about developing regional rail system in Portland's MSA. How will a new regional rail system effect development patterns in the Portland metro region? (Black Line == New Regional Rail)

Washington County
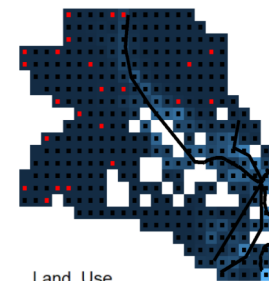
Clackamas County

Land_Use
- Developed
- Not Suitable

- Low Development Demand
- High Development Demand

Conclusion

A logit model can be successfully utilized to predict development risk Variables such as UGB designations, population change, and distance to critical infrastructure can all be used to predict development risk. Utilizing the 17% probability threshold, our model predicted at an accuracy of 90%. Consequently, we believe that this model can be utilized in other cities with more fine-tuning to predict urban growth. Finally, our resource allocation analysis indicates that new development — such as a new rail system, can significantly impact development demand.