



## Research paper

## Factors influencing zoning ordinance adoption in rural and exurban townships



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## HIGHLIGHTS

- Socioeconomics better predicted zoning adoption than diffusion or natural resources.
- Proactive local planning is an important precursor to zoning adoption.
- Many townships waited to zone until development was well underway.
- Informal controls may be insufficient to address unexpected development.

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## ABSTRACT

Though 70% of land in the contiguous U.S. is privately owned, land conservation discourses have focused more on public protected areas than on private land policy. U.S. private land policy is generally implemented by local governments through comprehensive plans and zoning ordinances. While most cities have adopted these policies many non-metropolitan jurisdictions remain unzoned. In this study we investigated factors predicting zoning adoption in rural and exurban Michigan townships. Results from a logit model showed that likelihood of zoning adoption between 1998 and 2003 was higher for townships with more developed land, fewer conservative voters, higher household income, more zoned neighbors, and township-level planning rather than county-level planning. We quantified thresholds at which development levels correlated with zoning adoption. Overall, townships had greater than a 50% probability of adopting zoning when 9% or more of their land base had been developed, but this threshold was higher in townships with no planning (12%) and highest where planning was implemented at the county level (19%). In high-growth townships forestland was negatively correlated with zoning adoption. However, model results showed socioeconomic variables to be better predictors of zoning adoption than natural resource variables. These results highlight the importance that planning and zoning occur at the same level of government, and the importance of multiple policy options in jurisdictions unlikely to adopt zoning. Gaining insight into reasons for land-use policy adoption, or lack thereof, is important for achieving common planning goals, including preserving rural livelihoods, conserving forests and farmlands, and maintaining rural landscape characteristics.

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## 1. Introduction

Rural landscapes are important providers of resource production, recreation, wildlife habitat, water quality, and aesthetics. Because these qualities can be drastically altered by development, tools for growth management in rural areas deserve attention (Marcouiller, Clendenning, & Kedzior, 2002; Rudel, 1989). Zoning

is the most widely used policy tool for regulating land use in the U.S. (Daniels, 1997), where it is implemented by local governments at the county and municipal levels. However, regulating land use is typically voluntary and local governments vary in their decisions to adopt zoning. Adopting growth control measures gained popularity during the “supercharged” housing booms of the 1970s, 1980s, and 1990s (Neiman & Fernandez, 2000). As of the late 2000s, however, many rural and exurban jurisdictions were still holding out on adopting land-use regulations. Although 97% of developable land area in the U.S. is considered rural (<6 housing units/sq. km) or exurban (6 to 147 housing units/sq. km) (Theobald, 2005), very little policy research has focused on non-metropolitan jurisdictions and why they do or do not regulate land use.

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**Table 1**  
Definitions of study variables, associated hypotheses and data sources.

Variable	Description	Hypothesis	References	Data Sources
<b>Motivation: development and population</b>				
Housing	Number of housing units per land area, 1990	Townships with higher housing density will be more likely to adopt zoning.	Allen, Moorman, Peterson, Hess, and Moore, (2013), Feiock et al. (2008), Hawkins (2014), Heimlich and Anderson (2001), Howell-Moroney (2008), Neiman and Fernandez (2000), Stedman (2003), Theobald (2005), Tilt et al. (2007)	U.S. Census Bureau (1991, 2001), Minnesota Population Center (2011)
Housing and population growth rates	Population and housing growth rates, 1990–2000	Higher population or housing growth will be associated with higher probabilities of zoning adoption.	"	"
% Land developed	% private land area that has been developed; includes low, medium, and high density development	Townships with more developed land area will be more likely to adopt zoning.	"	National Land Cover Dataset (NLCD) 2001 (Homer et al., 2007)
Distance to urban area (km)	Distance (km) to nearest urbanized area (pop. > 50,000)	Less remote townships will be more likely to zone	"	U.S. Census Bureau (2001)
<b>Motivation: socio-political</b>				
Income (\$1000s)	Median household income in 1999	Wealthier townships will be more likely to adopt zoning.	Allen et al. (2013), Feiock et al. (2008), Marcouiller et al. (2002), Morgan and Watson (1991), Howell-Moroney (2008)	U.S. Census Bureau (1991, 2001)
House value (\$1000s)	Median house value in 1990	"	"	"
Conservative voting and voting variability	Mean % votes cast for conservative (Republican or US Taxpayers Party) candidates in gubernatorial and presidential elections 1998–2010 and the standard deviation of this variable	Townships with consistently conservative voting patterns will be less likely to zone.	Kahn (2011)	Mich. Dept. of State (2001–2013)
<b>Motivation: natural resources &amp; amenities</b>				
% Public land	% land in federal, state, or local government ownership	Public lands and lakes attract development, and forests and farmlands represent natural commodities. Townships with more of these resources will be more likely to adopt zoning if they are experiencing high rates of housing growth.	Radeloff et al. (2010); Schnaiberg, Riera, Turner, and Voss (2002)	PAD-U.S. (USGS, 2010)
% Forest	% private land that is forestland	"	Edwards and Haines (2007), Hawkins (2014), York and Munroe (2010)	NLCD 2001 (Homer et al., 2007)
% Farmland	% private land that is farmland	"	"	"
Lake shoreline (km)	Total length of lakefront (Great Lakes and inland lakes)	"	Butsic et al. (2010); Gonzalez-Abraham et al. (2007); Schnaiberg et al., (2002)	Mich. Dept. of Natural Resources (Breck, 2004)
% Houses seasonal	% of total housing units that were classified seasonal or recreational in 1990	This measure will serve as a proxy for amenity value; townships with more seasonal homes will be more likely to zone.	"	U.S. Census Bureau (1991)
<b>Capital resources</b>				
Fiscal	Ratio of revenues minus expenditures to expenditures in 2001	Townships in positive fiscal standing will be more likely to zone.	Berry and Berry (1990), Gray (1973), Satterthwaite (2002), Walker (1969)	Mich. Dept. of Treasury (2001–2013), U.S. Census Bureau (2001)
Tax levy	Per capita property tax levies by township, 2000	Townships with higher tax revenue will be more likely to adopt zoning.	"	"
<b>Other policies</b>				
County and township policies	Land-use policies (other than zoning) present at county and township levels	Townships less likely to adopt zoning where more non-zoning land-use policies are in place.	Berry and Berry (2007)	IPPSR (2004)
Any plan	Presence of any comprehensive plan at the township or county level, or both	Townships where plans are present will be more likely to zone than those without plans.	Burby and Dalton (1994), Norton (2008)	"
County plan	Presence of a comprehensive plan at the county level	"	"	"
<b>External</b>				
Neighbors (Diffusion)	Percent of neighboring townships zoned	Townships having a greater percentage of neighboring townships with zoning ordinances will be more likely to adopt zoning themselves.	Mintrom (1997), Berry and Berry (2007)	IPPSR (2004), Mich. Center for Geographic Info (2011)

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