Growth Management and Agriculture: An Examination of Local Efforts to Manage Growth and Preserve Farmland in Wisconsin Cities, Villages, and Towns*

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ABSTRACT   In this paper we examine the effectiveness of growth man-
agement policies in Wisconsin cities, villages, and towns. Unlike most other
studies, we consider the impact of growth management policies on agri-
culture, specifically the preservation of farmland, in addition to popula-
tion growth. Our analysis examines these relationships separately in towns
and in cities/villages because of differences in their institutional struc-
tures. We mailed a survey to every city, village, and town in Wisconsin; the
surveys were supplemented by data collected from several secondary
sources. For both towns and cities/villages, growth management policies
are related positively to the rate of population growth. The fiscal structure
of localities proved to have a stronger effect on population growth for
cities and villages than for towns. Growth management capacity had little
effect for either type of municipality. The analysis of farmland preserva-
tion suggests that exclusive agriculture zoning is marginally effective in
limiting farmland conversion in towns, but ineffective in cities/villages.

Over the past 20 years, much of the research in community sociol-
ogy has focused on local efforts to promote growth and develop-
ment. An increasing number of localities, however, are adopting
policies intended to regulate growth (Baldassare 1990). The evi-
dence on the social, fiscal, demographic, and environmental con-
sequences of growth management is weak and sometimes contra-
dictory (Howell and Weber 1982). Less attention has been given to
the effectiveness of growth management policies in rural areas, es-
pecially regarding the loss of farmland. The factors influencing
economic development efforts may or may not be the same as
those shaping growth management efforts in these settings (Dono-
van, Neiman, and Brumbaugh 1994; Green 1995).

Growth management can be defined as public policies designed
to influence the rate, amount, type, location, and costs of growth

(Porter 1997). Growth management essentially seeks to balance the benefits of growth with the costs imposed on the environment and quality of life (Perin 1977). In this paper we examine the effectiveness of growth management policies in cities/villages and towns.[1] Unlike most other investigators, we consider the impact of growth management policies on agriculture, specifically the preservation of farmland. First, we examine the extent to which growth management efforts are related to population change over and above the effects of other influences, such as proximity to a metropolitan area and municipal fiscal structure. Second, we explore whether use of exclusive agricultural zoning is related to the amount of land rezoned to residential and commercial use.

The problem of farmland conversion has received increased attention in recent years. Each year in the United States, more than one million acres of farmland are lost to suburban sprawl (Daniels and Bowers 1997:1). The assault on farmland has affected states across the country, such as Minnesota (24,000 acres), Colorado (90,000 acres), and Florida (150,000 acres). From 1950 to 1998 the amount of farmland in Wisconsin decreased from 23.6 million to 16.4 million acres. Since 1990, the loss has been 1.2 million acres. Of the 100,000 acres that have been removed from production since 1997, 72 percent are located in nonmetropolitan counties.

Municipalities are using several tools to address the problem of farmland conversion: agricultural zoning, urban growth boundaries and urban service areas, the purchase and/or transfer of development rights (PDR and TDR), agricultural districts, and land trusts, among others. The effectiveness of these programs is questionable. In their analysis of farmland preservation and planners' attitudes in the Northeast, for instance, Pfeffer and Lapping (1994) found that despite some success at limiting farmland conversion through the purchase of development rights, planners had no illusions as to the long-term effectiveness of the program.

According to Daniels and Bowers (1997:106), agricultural zoning is the most common land use tool employed to combat the conversion of farmland. It is popular because it is usually under the control of local governments, is inexpensive, can be used over wide areas, and is flexible: that is, it can be changed easily as circumstances warrant. The effectiveness of agricultural zoning depends in part on its scope and strength.

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[1] In Wisconsin, incorporation as a city or a village is based on different criteria depending on whether the community is in a metropolitan or a nonmetropolitan area. Incorporation as a city requires a minimum population of 1,000 in a nonmetropolitan area but 2,500 in a metropolitan area (State of Wisconsin 1993). A town is a minor civil division outside both cities and villages. In some states, towns are known as townships.

Only Hawaii and Wisconsin have significant programs of *exclusive* agricultural zoning. The Wisconsin program offers incentives for voluntary action by individuals and local government (Emelock 1989:12). Farmers in localities that have implemented exclusive agricultural zoning can enroll their farmland in exchange for property tax relief. Furthermore, localities must satisfy a more restrictive set of guidelines in order to rezone agricultural land for development (e.g., existence of public facilities adequate to accommodate development; no negative environmental impacts) (1989:15).

According to Emelock, exclusive agricultural zoning has been successful in regard to participation by farmers and counties: it has been implemented in 42 of Wisconsin's 72 counties. Many of the participating counties are located in the most urbanized areas of the state, especially in the southeast. Within these counties, 120 towns currently are taking part with their own certified exclusive agricultural zoning ordinances, 272 towns are using their county's exclusive agricultural zoning, and 36 cities and villages have implemented municipal exclusive agricultural zoning. The program relies on voluntary participation by farmers; thus it is likely to lose any effectiveness it may have as developmental pressures force up the value of farmland. Emelock (1989), for instance, argues that additional incentives will be needed in the face of expanding urbanization. Wisconsin, however, is an excellent site for studying whether exclusive agricultural zoning will slow the loss of farmland.

Both efforts to manage growth and exclusive agricultural zoning can be seen as attempts to influence the effects of development. Growth management encompasses a mix of regulatory techniques that include zoning. Agricultural zoning is used to promote orderly growth, to reduce conflict between farmers and nonfarmers, to control the costs of public services, and to protect public values such as open space and local ecology (Daniels and Bowers 1997:105). Daniels and Bowers (1997:16) refer to a number of studies in which farmland protection measures are presented as ways to reduce the costs associated with growth.

Growth Management and Community Change

Two broad theoretical positions have dominated the literature on local development: public choice/structuralist theory and growth machine theory.

Public choice/structuralist theory emphasizes the role of local fiscal and economic conditions in shaping growth and change. One of the most influential statements of the structuralist position is Peterson's (1981) analysis of urban development, in which the author takes a public choice approach to explaining the adoption and effectiveness of local development policies. Peterson argues that municipalities are constrained to promote their economic interests be-

cause they compete with other cities to attract new firms and residents. In an effort to attract (and retain) capital and population, government officials implement policies that keep businesses and tax-paying residents from moving to another city that offers a more desirable mix of services at lower cost. Officials' preference for a pro-development strategy is made even easier by the assumption that growth is beneficial to all residents. An assumption of the public choice/structuralist position is that local government policies can shape growth patterns through their fiscal and economic policies.

Over the past few decades, growth machine theory has become one of the conceptual frameworks used most widely to understand community growth and change. In their influential book *Urban Fortunes*, Logan and Molotch (1987) argue that a land-based elite in cities promotes growth to enhance the exchange value of land. By encouraging the adoption of pro-growth government policies, landowners, speculators, realtors, operators of locally owned businesses, and other local entrepreneurs create an environment favorable to development. This elite profits from such policies, either as actual project developers or as beneficiaries of the resulting growth. According to Logan and Molotch, pro-growth actors usually succeed in influencing policy because of their disproportionate impact on local politics. Equally important, however, is their ability to propagate the perception that growth is beneficial to all residents. Logan and Molotch doubt that efforts to manage growth can overcome the structural bias of pro-growth interests in cities.

Localities increasingly have adopted policies that attempt to manage growth in light of the growing evidence that development can have negative effects, which are shared unequally. The explanation for the adoption of these policies, and the likelihood of success at achieving their objectives, are interpreted somewhat differently by the structuralist and the growth machine theories. Structuralists recognize that too much growth may produce costs for local governments, primarily through the high cost of providing services. In response to these conditions, local governments may favor growth management policies that shift the cost burden of growth to developers, and ultimately to new residents. Public officials, however, do not want to implement policies that may deter economic growth. The assumption behind such policies is that they will work to manage more effectively some of the costs associated with growth. Thus, according to this position, a locality's fiscal condition is the primary factor determining the adoption of growth policies.

Logan and Molotch claim that "[i]ntervention in land use in the United States has never been meant to replace the operation of the property marketplace, only to smooth out its functioning" (1987:153). Growth machine theorists interpret the adoption of growth management policies in terms of political conflict rather than as a con-

sensual fine-tuning of existing policies. Policies to manage growth might be adopted as a result of the electoral strength of anti-growth forces or as a tactical retreat by pro-growth forces. In either case, growth machine theorists generally assume that such policies will exert a negligible effect on growth patterns because pro-growth coalitions are so successful in promoting growth, even when policies to manage growth are nominally in place. Similarly, the fiscal situation of localities should exert only a minimal effect on population growth.

Empirical Research on Growth Management

A few studies have examined the relationship between growth management policies and population growth. For the most part, these policies have not been effective in controlling growth rates (Baldassare and Protash 1982; Donovan and Neiman 1995; Logan and Zhou 1989). Logan and Zhou, for instance, merged census data from 1970 to 1980 with a 1973 survey of city planning officials to evaluate the effects of growth-control policies. They found that growth controls had only a modest effect on subsequent changes in local population, median family income, median rent, and the percentage of population that was black.

Donovan and Neiman (1995) conducted a similar analysis among incorporated places in southern California from 1980 to 1990, and found that growth management policies were more prevalent in cities that were growing more rapidly. Donovan and Neiman considered the effects of both general residential land use regulations and the more restrictive policies that were aimed explicitly at constraining access to the community. Their results confirmed two key findings of the Logan and Zhou study: growth controls may affect the racial composition of communities, and the existence of growth controls appears to exert a negligible effect on the growth rate. In many cases, findings that depict such policies as ineffectual simply reflect the fact that anti-growth measures frequently were adopted after (and in response to) earlier growth spurts.

Growth management policies have proved more effective in changing the character of growth. For example, studies have shown that these policies can cause changes in the type and quality of housing built, and consequently in the price (Zorn, Hansen, and Schwartz 1986). Similarly, Shlay and Rossi (1981) examined the social and demographic changes in 395 central-city and suburban census tracts in the Chicago metropolitan area from 1960 to 1970. They considered two different dimensions of zoning: land uses permitted within each district and minimum lot area per dwelling unit. When examining the effects of zoning on local housing composition, Shlay and Rossi found that the exclusionary zoning index was related negatively to the density of suburban tracts in 1970. Warner

and Molotch (1995) argue that although growth controls do not necessarily limit development, they permit a municipality to demand greater public benefits from this growth. As suggested by the above examples, however, these "benefits" exert differential effects on residents, which frequently play out along racial and class lines.

Most of the empirical research on the effects of growth management policies has focused on cities and suburbs; very little attention has been directed at nonmetropolitan communities, with only a few key exceptions. Most studies on growth management and land use in rural areas have been interested in explaining the adoption of land use controls or residents' support for such controls. Garkovich (1982) studied the conflicts over land use in an exurban area near Lexington, Kentucky. Pratt and Rogers (1986) examined several factors influencing the adoption of land use controls. Rudel (1984) assessed the factors related to rural land use planning across states. Geisler and Mitsuda (1987) looked at the influences on the presence or absence of mobile home regulation through local zoning. Green et al. (1996) examined the differences between seasonal and permanent residents in rural Wisconsin regarding attitudes toward land use planning and local economic development.

Type of Municipality

In this analysis we are interested in comparing the effects of growth management efforts in cities and villages versus towns. Towns and cities/villages can vary on several different dimensions with respect to growth dynamics (see Long 1998).

The actors behind growth efforts may vary in these different settings. Farmers generally play a much larger role in the towns, which are much more likely to be in rural areas. Often they may hold contradictory positions regarding growth and preservation of agricultural land. Although most farmers favor policies restricting land use in the case of farmland, many also want to retain the development rights so they will have the option to "cash in" on their investment when they retire (see, e.g., Bourke, Jacob, and Luloff 1996; Bunce 1994; Furuseth 1987; Kline and Wichelns 1996). Their interests, however, are much more contradictory than those of the typical proponents of growth in cities, such as relators and developers. On the other side, the primary proponents of growth management in these settings tends to be exurbanite residents or "newcomers" who are interested in preserving the local amenities. These residents may be less highly organized than environmental groups and organizations in cities and villages, but they may influence local politicians more directly.

Towns are often limited in their resources and expertise for effective management of growth in their territory. In cities and villages, development is much more location-specific; in towns, rela-

tors and developers have many more options for locations of development projects. Because of this difference, towns may not face as much growth pressure, but they also may lack the capacity to control growth in any case.

According to Peterson, a pro-growth tendency is set into motion by the establishment of a system of mutually exclusive political jurisdictions whose interactions are guided by the principle of competition. It is questionable, even in the theory's own terms, whether the suggested dynamic applies with equal force to all types of fragmented regions. For example, can competition be different in regions characterized by geographically large, sparsely populated, and administratively weak towns? What happens when the relevant units of analysis are more isolated from one another? And what of rural towns situated near metropolitan areas? The work of Logan and Molotch displays similar conceptual weaknesses. In *Urban Fortunes*, for instance, the authors discuss rural areas principally as fringe areas experiencing the pressures of suburbanization.

A related issue is the fact that cities, villages, and towns typically have different levels of taxing and spending authority, which are set either constitutionally or by statute. Furthermore, organizational flexibility and policy areas are affected by these enabling acts. In Wisconsin, for instance, cities and villages are provided with constitutionally sanctioned home rule powers, which give greater leeway in the organization of local government and in the types of activities undertaken (Donoghue 1979).

Wisconsin towns, in contrast, are governed on the basis of grants of statutory authority. Their actions and governmental structure are limited to what the statutes expressly permit. Towns tended to develop as top-down extensions of state and county government to provide political and administrative services to rural areas (LeMay 1975). In this sense they do not embody the traditional centrality of the town, as might be the case in New England.

In addition to these differences in governmental structure and authority, cities, villages, and towns frequently face different types of issues. A principal concern of Wisconsin towns, for instance, is the annexation of town land by cities and villages. Similarly, for towns, farming may be more than an economic mainstay deserving protection; it also may be a cherished way of life that needs to be preserved regardless of the cost.

Overall, this discussion suggests that towns may not face as much pressure to manage growth as do cities and villages, and that when they wish to do so, they have less capacity to implement effective policies. Cities and villages face a broader set of political and economic forces; thus they may be less likely to promote growth at all costs. In addition, they have much greater capacity to implement effective policies.

Demographic, Fiscal, and Growth Management Influences

In this paper we examine how population growth and agricultural land rezoning are affected across cities, villages, and towns by demographic, fiscal, and growth management variables.[2] Below we present the variables that we use in the analyses.

Demographic Characteristics

Because cities, villages, and towns are likely to differ significantly in demographic characteristics, we include controls for population size and for location in a metropolitan area. Previous studies showed that population size may facilitate the adoption of growth management policies (Green 1995). Population size may be associated positively with greater complexity in the depth and types of conflicts facing municipalities. Organized citizen action similarly may be more prevalent. Furthermore, municipalities may be more willing and better able to implement policies because of a possible correlation between size and municipal organizational capacity.

Location of a municipality within a metropolitan area also may influence rates of population growth and farmland conversion. Greater proximity to urban areas and higher population densities make all municipalities, regardless of their specific circumstances, susceptible to growth pressures in neighboring localities. Berry (1978), for instance, found that a process of urbanization affected both the scope and the characteristics of farming in the urbanizing area. Not only was the outright conversion of farmland to urban uses accelerated; increased urbanization also led to the idling of farmland due to growing land speculation and to gradual changes in the type of farming undertaken. For instance, activities such as dairying, which involve large investments in infrastructure and immobile equipment, began to be replaced with more flexible types of farming characterized by shorter time horizons.

Similarly, Lopez, Adelaja and Andrews (1988) found that urbanization reduced efficiencies and discouraged use of capital and land. Lockeretz (1989) confirmed the relationship between farm characteristics and metropolitan status, finding that farms farther from urbanized areas tended to be larger, to use less land for crops, and to raise more livestock.

Fiscal Characteristics

We include fiscal exertion, as embodied in measures of local property values, debt, and tax rate, as a potentially relevant factor in un-

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[2] Although villages and cities differ somewhat in organizational structure and authority, the characteristics they share—especially in relation to towns—lead us to treat cities and villages as a single type of governmental unit for purposes of this analysis.

derstanding rates of population growth and farmland conversion. The relationship between population growth and fiscal exertion is not clear. Insofar as growth takes place faster than the municipality can provide basic public services, one would expect population growth to be accompanied by greater fiscal strain. Ladd (1990), for instance, found that rapid growth can reduce per capita spending on services.

Do municipalities respond to fiscal strain by encouraging growth or by trying to restrain it? The answer depends partly on local beliefs about the relationship between growth and local fiscal health: that is, whether growth imposes economic costs greater than the financial benefits it promises. Evidence for Wisconsin suggests that many localities view growth as a way out of financial strain. Wolensky and Enright (1991), for instance, found that small Wisconsin governments adopted "indirect coping strategies" of population growth, economic development, and annexation as a way to deal with fiscal crisis. Similarly, Magill (1988) found that Wisconsin cities, in contrast to those of Florida and the United States in general, were more likely to raise taxes in order to maintain services when faced with fiscal strain. These responses to growth may vary by the type of governmental entity in question. In a recent survey of growth management efforts in Wisconsin, almost one-third (30.6%) of cities and villages identified the potential budgetary impact of growth as the major development concern in their land use policies, compared with only 9.2 percent of towns (Green et al. 1998a, 1998b).

Local perceptions of the financial consequences of growth also may affect the likelihood of farmland conversion. Insofar as development is viewed as an answer to fiscal strain, municipalities may be more inclined to encourage alternative uses for farmland. This possibility is suggested in the above-cited results of Wolensky and Enright (1991), who found that Wisconsin municipalities facing fiscal crisis were more likely to engage in annexation.

We incorporate the concept of fiscal exertion into our analysis by examining municipal debt (per capita), the municipal tax rate, and equalized value (per capita) for the municipalities in our sample. The effective tax rate represents the percentage of local value paid in taxes. Municipal debt more directly influences the behavior of local government, whereas the effective tax rate is likely to influence individual decision making more directly. Equalized value represents the full market value of all taxable property in a municipality; it is akin to fiscal capacity because it reflects a community's potentially taxable wealth.

Growth Management Capacity and Policies

Insofar as financial variables influence growth, the processes involved are frequently more indirect and not necessarily in-

tentional. Cities, villages, and towns have more direct means of influencing growth, as in the adoption of pro-development or anti-sprawl policies. To implement such policies, however, municipalities require the legal authority and administrative infrastructure to undertake growth management effectively. In our analysis we include three practices which, in combination, reflect the degree of a municipality's ability to intervene in local land use issues: existence of a land use plan, zoning authority, and coordination with neighboring communities and/or regional entity. As a final step, we examine more than whether a planning infrastructure is in place, and look at the effect of specific growth management policies: commercial and residential zoning, multifamily housing, design review standards, strategic use of capital improvements and infrastructure, and exclusive agricultural zoning.

Data and Measurements

The principal data for this analysis are drawn from two surveys of Wisconsin towns, cities, and villages conducted in 1998. We sent surveys to every city and village ($N = 584$) and town ($N = 1,266$) in Wisconsin. For cities and villages, we obtained a response rate of 63.5 percent ($n = 371$); the response rate for towns was 48.3 percent ($n = 612$). The surveys were supplemented by secondary data collected by the U.S. Census Bureau, several departments of the State of Wisconsin, and a University of Wisconsin Extension report (Ohm and Schmidke 1998).

We obtained municipal population figures for 1990 from the U.S. Census Bureau, and population estimates for 1998 from the Wisconsin Department of Revenue. We calculated the estimated population figures on the basis of the known 1990 numbers, adjusting for subsequent changes as measured by the number of income tax filers, dependents, and vehicle registrations. The population growth rate was calculated for each municipality on the basis of the 1990 and 1998 figures.

Estimates for the number of acres of agricultural land rezoned to residential use were obtained directly from the cities, villages, and towns in the survey. City and village figures are not entirely comparable to those obtained from the towns because the former were asked to provide an exact number, while the latter were asked to choose among a series of ranges. Furthermore, we took different measures of the dependent variable for towns and for cities/villages. City and village officials were asked to report the number of acres rezoned in the past five years (1993–1998), while town officials were asked to identify the approximate number of acres rezoned in the past year. The decision to choose a shorter period for towns was based on our concern about town officials' ability to calculate this figure accurately for the longer time frame. Because

more acres are likely to be rezoned in towns, we thought the figure for the previous year would be most accurate. Also, cities/villages do not rezone as much agricultural land as do towns; therefore the use of only the previous year might be misleading because of fluctuations over a number of years.

Data on municipal debt and the tax rate were obtained from the Wisconsin Department of Revenue. The figures used pertain to 1996. We calculated per capita amounts with population estimates. Wisconsin municipalities are limited in the amount of debt they can assume, to 5 percent of their equalized value. (Equalized value is a dollar amount based on the full market value of all taxable property.) The tax rate used in this study is the effective full value rate; it was calculated by the Wisconsin Department of Revenue (1998) on the basis of 1997 data. This rate represents the percentage at which the value of local property was taxed. For purposes of comparison, it is preferable to local property tax rates because the divisor (the full value of taxable general property) is calculated with a common methodology meant to reflect actual market value. It avoids the problem of using locally determined assessed value as the basis for calculation.

All data on growth management practices and adoption of growth management policies were obtained either directly from the survey instrument or from Ohm and Schmidke's (1998) inventory of Wisconsin land use plans and zoning practices. Our first measure was existence of a land use plan. Data for this measure were obtained from the Ohm and Schmidke inventory, and indicate whether the governmental unit in question had its own individual land use plan as of 1998.[3]

In Wisconsin, the issue of land use planning is complicated by the lack of statutory guidance as to what constitutes a "plan." Jurisdictional authority for planning, principally between counties and towns, remains ill-defined (Ohm and Schmidke 1998:2–3). A land use plan can denote any measure intended to affect land use regardless of the jurisdictional level involved (e.g., municipality, county, region), the scope of the measure (e.g., comprehensive,

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[3] Data on most of the growth management policy variables used in this study were obtained for the most recent year available, usually 1997 or 1998. The dependent variables under study—percentage change in population (1990–1998) and acres of farmland rezoned—encompass periods that are previous or contemporary; therefore it is impossible to make any strict causal claim about the efficacy of growth management policies in reducing population growth or limiting rezoning of agricultural land. Data on land use planning, however, contained the year of plan adoption; thus it permitted a separate analysis where the planning variable is coded to identify only localities with plans in place since 1990. Although adoption of a land use plan remained nonsignificant for both towns and cities/villages, the sign changed from positive to negative in relation to population growth. This finding suggests that growth management policies may reduce growth rates over time.

metropolitan, neighborhood), or the function (e.g., development, transportation, sewer). In Wisconsin, authority to implement such plans comes from different laws and involves a variety of procedures. This situation not only makes it difficult to compare planning efforts across jurisdictions; it also contributes to jurisdictional confusion among governmental entities.

For instance, towns in Wisconsin have the authority to design and adopt their own land use plan. Counties, however, also have the authority to adopt county land use plans, which, of necessity, incorporate towns. As a result of inconsistencies in the law, some towns regard themselves as planned only if they have adopted their own plan, while one-half of the towns covered only by a county plan report that they are planned. To add to the confusion, counties are required to incorporate city and village plans into a county development plan "without change," but the law is largely silent in the case of towns. For these reasons, we avoid possible inconsistencies in responses by including (like Ohm and Schmidke) only individually approved land use plans.

Zoning is one tool used to implement a land use plan. In contrast to planning, Wisconsin counties cannot apply county zoning to towns without approval by the town. If the town gives its approval, it is said to be administered under county zoning. If the town refuses to adopt county zoning, it can either remain without any zoning or adopt its own zoning ordinance. Approval by county officials is needed, however, to adopt one's own zoning in a county where countywide zoning already is in place. In counties without county zoning, the town is free to adopt its own zoning regulations.

For towns, therefore, three zoning situations are possible: no zoning, county zoning, and individual zoning. Although one type of zoning predominates in some counties—especially the more urban counties, where county governments have forgone county-level zoning by requiring all towns to adopt individual zoning regulations—the typical county contains a mixture of different zoning types located side by side. For purposes of our study, we define a town as zoned if it either has its own zoning or has adopted county zoning. We obtained the data on towns from the Ohm and Schmidke report. The data on zoning for cities and villages were obtained directly from these municipalities through our survey instrument.

As a final measure of growth management capacity, in addition to the adoption of a land use plan and zoning authority, we ask whether growth management and planning efforts have been coordinated with neighboring communities and/or regional bodies. We obtained this information from the survey instrument.

In addition to growth management capacity, we examine the effect of specific growth management policies (the data for which we collected in our survey): downzoning commercial and residential

Table 1.   Characteristics of Wisconsin Cities, Villages, and Towns

	Cities and Villages		Towns	
	Mean	SD	Mean	SD
1990–1998 Population growth (%)	9.1	10.4	6.3	7.0
Approximate acres rezoned[a]	52.2	114.7	43.9	108.5
1990 Population	6,881	35,488	1,268	1,658
Metropolitan county (metro = 1)	.361	.481	.287	.453
Municipal debt (per capita)	$558	$542	$74	$198
Effective tax rate (%)	2.28	.348	1.93	.285
Equalized value (per capita)	$35,211	$36,896	$46,591	$26,771
Land use plan (yes = 1)	.543	.499	.200	.401
Zoning (yes = 1)	.903	.297	.764	.425
Coordination (yes = 1)	.310	.463	.332	.471
Reduce development zoning (yes = 1)	.063	.242	.266	.442
Limit multifamily units (yes = 1)	.112	.316	.141	.348
Design review standards (yes = 1)	.488	.500	.207	.406
Use of capital improvements (yes = 1)	.350	.478	.093	.291
Aggregate growth management variable (0–7)	2.84	1.68	1.94	1.73
Exclusive agricultural zoning (yes = 1)	.057	.232	.353	.478

[a] Mean acres rezoned for cities and villages correspond to the five-year period 1993–1998; the figure for towns covers one year (1997–1998).

land, multifamily housing restrictions, design review standards, and the strategic use of capital improvements and infrastructure to influence development. In the analysis of the amount of agricultural land rezoned to residential use, we include in the model whether the locality has exclusive agricultural zoning. We obtained this information from the State of Wisconsin. Further, we used the three growth management capacity variables and the four policy variables to create an index of growth management policies. For the additive index ("growth management policies"), the reliability score was $\alpha = .733$ for towns and $\alpha = .672$ for cities and villages.

Descriptive Analysis

In Wisconsin, rates of population growth tended to be higher in cities and villages than in towns (Table 1). From 1990 to 1998, the population of cities and villages grew at an average rate of 9.1 percent (median = 6.2%). During the same period, the average growth rate for towns was 6.3 percent (median = 5.4%). Cities and villages had rezoned an average of 52.2 acres in the previous five years. Towns were estimated to have rezoned an average of 43.9 acres in the past (one) year. Although towns probably had rezoned more land over the past five years than cities and villages, towns also encompass much larger areas in most cases.

Cities and villages had an average 1990 population of 6,881 (median = 1,279); towns averaged 1,268 (median = 810). Slightly more

cities and villages than towns are located in metropolitan counties: 36 percent of cities and villages are in metro counties, compared with 28.7 percent of towns.

Towns were much less likely to be in debt than were cities and villages. The average per capita debt for towns was $74; for cities and villages, $558. In fact, over one-half (53.5%) of towns had no debt in 1996, compared with only 8.7 percent of cities and villages. Furthermore, the cities and villages in our sample were indebted, on average, to nearly one-third (33.2%) of their limit (set by law at 5 percent of equalized value), compared with a town average of only 3.7 percent. The average effective tax rate for cities and villages was also higher: 2.28 percent of full value for cities and villages versus 1.93 percent for towns. Per capita equalized value, however, was significantly greater for towns ($46,591 versus $35,211).

Growth management capacity, as measured by presence of a land use plan, zoning, and coordination with neighboring communities, is greater in cities and villages: more than half (54.3%) of cities and villages had land use plans, as did only 20 percent of towns. Similarly, almost all (90.3%) cities and villages in our sample had zoning ordinances, compared with 76.4 percent of towns. The level of coordination with neighboring communities and/or regional entities, however, was similar for towns and for cities/villages: approximately 33.2 percent and 31 percent respectively.

Towns were more likely than cities and villages to adopt exclusive agricultural zoning and to reduce the amount of land zoned for development. The application of design review standards and the use of capital improvements to influence development were the favorite growth management tools for cities and villages.

Population Growth Rate

Tables 2 and 3 display the relationship of demographic, fiscal, and growth management variables to rates of population growth in Wisconsin municipalities. For cities and villages (Table 2), we found significant relationships for all demographic and financial variables. Location within a metropolitan county had a strong positive association with population growth. Population size was related negatively to the population growth rate.

Per capita municipal debt proved to be related positively to the population growth rate. Because our data are cross-sectional, the causal direction of this relationship cannot be determined. Perhaps increased expenditures were needed to satisfy the strain on public services caused by increased population growth, or pro-growth municipal policies designed to attract development through increases in investment in infrastructure and public services may have proved successful. In a separate section of our survey, we found that cities

and villages were three times more likely than towns (30.6% versus 9.2%) to name the budgetary impact of development as the concern most important to their land use policies. This finding suggests that increased debt has been an undesired effect rather than part of an active policy of growth.

Both the effective tax rate and the per capita equalized value are related negatively to the population growth rate. In other words, municipalities with relatively low tax burdens have tended to grow faster. This finding, of course, is consistent with Peterson's argument. The fiscal capacity of municipalities, as measured by per capita equalized value, tends to be greater in places that are growing less rapidly. As suggested by some of the literature cited above, wealthier municipalities may be less susceptible to pro-growth pressures.

Variables measuring growth management capacity and policies were generally not related significantly to population growth. Only zoning and three of the four growth management policies were significant in some of the models. Presence of a land use plan and coordination of planning efforts with neighboring communities showed no significant association with population growth. These findings are consistent with much of the literature, which suggests that such policies are largely ineffective in controlling population growth. Furthermore, the finding of a positive relationship between zoning and growth suggests that such policies in fact may be local communities' responses to existing rapid population growth.

The results for Wisconsin towns differed in important ways. As with cities and villages, both demographic variables were related significantly to population growth. Whereas the relationship between growth and 1990 population was negative for cities and villages, it was positive for towns. Smaller towns therefore tended to grow less rapidly than larger towns, while smaller cities and villages grew faster than larger cities and villages. Although location in a metropolitan county was related positively to population growth, it explained less of the variance than did the same variable for cities and villages.

The findings for the fiscal characteristics of towns also differed markedly from those of cities and villages. Per capita debt and the tax rate were not related significantly to population growth for towns. The failure of the tax rate to influence growth suggests that businesses and residents in towns may not relocate easily in response to economic stimuli. Towns with greater fiscal capacity (i.e., per capita equalized value), however, tended to attract new residents more rapidly.

Finally, we found a weak relationship between the growth management variables and population growth. Presence of a land use plan, zoning, and coordination with neighboring communities all

Table 2. OLS Regression Analysis of Percentage Population Change in Wisconsin Cities/Villages, 1990–1998

	Baseline Model	Reduce Dev't Zoning	Limit Multi-Family Units	Design Standards	Capital Improvement
Demographic factors					
1990 population (000)					
B	-3.73E-04*	-3.63E-04*	-3.36E-04*	-3.88E-04**	-3.80E-04*
SE B	1.45E-04	1.44E-04	1.43E-04	1.45E-04	1.49E-04
Beta	-.128	-.126	-.117	-.136	-.133
Metropolitan county					
B	.061***	.063***	.052***	.057***	.067***
SE B	.011	.011	.011	.012	.012
Beta	.280	.287	.241	.263	.302
Fiscal structure					
Debt (per capita)					
B	3.90E-05***	4.27E-05***	4.46E-05***	3.68E-05**	3.34E-05**
SE B	1.13E-05	1.25E-05	1.24E-05	1.29E-05	1.19E-05
Beta	.203	.202	.212	.180	.174
Effective tax rate					
B	-.041**	-.043**	-.039**	-.040**	-.045**
SE B	.015	.015	.015	.015	.016
Beta	-.139	-.144	-.133	-.137	-.147
Equalized value (per capita)					
B	-4.47E-07**	-4.03E-07*	-4.74E-07**	-4.45E-07**	-4.29E-07*
SE B	1.61E-07	1.62E-07	1.60E-07	1.66E-07	1.67E-07
Beta	-.159	-.142	-.168	-.161	-.155
Growth management capacity					
Land use plan					
B	.014	.014	.008	.010	.013
SE B	.012	.012	.012	.012	.013
Beta	.066	.065	.039	.047	.061

Zoning					
B	.040*	.040*	.035	.034	.043*
SE B	.018	.019	.018	.019	.020
Beta	.113	.108	.099	.097	.118
Coordination with neighboring communities					
B	.011	5.16E-04	.011	.003	.006
SE B	.012	.012	.012	.012	.014
Beta	.050	.002	.047	.016	.028
Growth management policies					
Reduced land zoned residential or commercial					
B	—	.063**	—	—	—
SE B		.022			
Beta		.147			
Limit number multifamily units					
B	—	—	.058***	—	—
SE B					.017
Beta					.178
Design standards					
B	—	—	—	.030*	—
SE B				.012	
Beta				.142	
Use capital improvements to influence growth					
B	—	—	—	—	.013
SE B					.012
Beta					.058
(Constant)					
B	.114**	.113**	.112**	.110**	.118**
SE B	.038	.038	.037	.038	.040
R^2	.187	.213	.215	.205	.199
Adj. R^2	.169	.192	.194	.183	.176
N	362	346	351	340	325

$*p < .05; **p < .01; ***p < .001.$

Table 3. OLS Regression Analysis of Percentage Population Change in Wisconsin Towns, 1990—1998

	Baseline Model	Reduce Dev't Zoning	Limit Multi-Family Units	Design Standards	Capital Improvement
Demographic factors					
1990 population (000)					
B	.009***	.009***	.009***	.007***	.008***
SE B	.002	.002	.002	.002	.002
Beta	.208	.212	.211	.167	.189
Metropolitan county					
B	.015*	.017*	.015*	.013*	.014*
SE B	.007	.007	.007	.007	.007
Beta	.094	.110	.097	.086	.095
Fiscal structure					
Debt (per capita)					
B	2.17E-05	1.97E-05	2.10E-05	1.82E-05	-5.02E-07
SE B	1.40E-05	1.39E-05	1.41E-05	1.41E-05	1.44E-05
Beta	.061	.057	.060	.052	-.001
Effective tax rate					
B	-.017	-.015	-.013	-.016	-.015
SE B	.010	.010	.011	.011	.011
Beta	-.068	-.060	-.054	-.063	-.061
Equalized value (per capita)					
B	6.13E-07***	6.99E-07***	6.41E-07***	5.67E-07***	5.84E-07***
SE B	1.08E-07	1.14E-07	1.15E-07	1.16E-07	1.15E-07
Beta	.233	.255	.236	.207	.220
Growth management capacity					
Land use plan					
B	.012	.004	.008	.009	.014
SE B	.008	.008	.008	.008	.008
Beta	.071	.025	.047	.052	.082

Zoning					
B	-.010	-.009	-.011	-.012	-.011
SE B	.007	.007	.007	.007	.007
Beta	-.059	-.058	-.064	-.070	-.066
Coordination					
B	.003	.005	.002	-.002	.001
SE B	.006	.006	.006	.006	.006
Beta	.019	.037	.012	-.014	.003
Growth management policies					
Reduce land zoned residential and/or commercial					
B	—	-.004	—	—	—
SE B		.007			
Beta		-.026			
Limit # multifamily units					
B	—	—	.007	—	—
SE B			.009		
Beta			.034		
Design review standards					
B	—	—	—	.030***	—
SE B				.008	
Beta				.173	
Use capital improvements to influence growth					
B	—	—	—	—	.020*
SE B					.010
Beta					.087
(Constant)					
B	.054*	.046	.046	.055*	.053
SE B	.024	.024	.024	.025	.024
R^2	.175	.180	.172	.195	.170
Adj. R^2	.164	.167	.159	.182	.156
N	599	572	574	568	563

$*p < .05; **p < .01; ***p < .001.$

Table 4.   OLS Regression Analysis of Approximate Acres Rezoned

	Cities / Villages	Towns
1990 Population (000)		
B	.218	10.862 **
SE B	.831	3.846
Beta	.020	.166
Metropolitan county		
B	29.889	6.434
SE B	17.499	13.270
Beta	.138	.028
Debt (per capita)		
B	.034	−.008
SE B	.021	.027
Beta	.131	−.016
Effective tax rate		
B	−3.792	−18.167
SE B	20.676	21.686
Beta	−.013	−.045
Equalized value (per capita)		
B	−8.49E-05	−2.34E-04
SE B	2.63E-04	2.87E-04
Beta	−.024	−.044
Growth management effort (aggregation)		
B	9.836	10.336 **
SE B	5.283	3.970
Beta	.163	.164
Exclusive agricultural zoning		
B	43.986	−18.540
SE B	25.496	12.061
Beta	.123	−.084
Population growth (1990–1998)		
B	145.394	228.900 **
SE B	78.657	86.328
Beta	.147	.146
(Constant)		
B	−6.364	43.440
SE B	47.136	47.560
R^2	.215	.132
Adj. R^2	.180	.112
N	186	367

$*p < .05; **p < .01; ***p < .001.$

appeared to be neutral factors. Only design review standards and use of capital improvements were related significantly to growth; as in the case of cities and villages, this relationship was positive.

Rezoning of Agricultural Land

Some factors are related to the number of acres a municipality has rezoned from farmland into residential use (Table 4). In examin-

ing these factors, we include the same demographic and financial variables as in the previous model, but consolidate the growth management variables into an aggregate index. We also include the 1990–1998 population growth rate (i.e., the dependent variable of the previous analysis) as an independent variable.

For towns, the 1990–1998 population growth rate was related positively to acres of farmland rezoned. Such rezoning tended to be greater in the towns that grew fastest. Furthermore, both population size (as of 1990) and the aggregated growth management variable were related significantly to acres rezoned. The positive relationship between growth management policies and acres rezoned casts further doubt on the effectiveness of these measures to control growth. Farmland rezoning tended to affect a greater number of acres in the more heavily populated towns. The adoption of exclusive agricultural zoning was not related significantly ($\alpha = .125$) to a decrease in the amount of acreage rezoned to residential use. Finally, none of the other variables showed any significant relationship to the dependent variable.

As in the case of towns, the existence of exclusive agricultural zoning in cities and villages barely failed to reach an acceptable level of significance ($\alpha = .086$) with respect to the number of farmland acres rezoned. Unlike the case in towns, however, the relationship was positive: adoption of exclusive agricultural zoning tended to be associated with more farmland rezoning. The conflict of results between cities/villages and towns might suggest that cities and villages have reacted (late) to processes already well under way, whereas towns face a less hostile and less concerted assault on their farmland. Furthermore, loss of farmland may be more harmful to a rural town's economic well-being; thus exclusive agricultural zoning might be implemented there more successfully.

Although the regression model for cities and villages explains .215 of the variance, no variable is significant at the $\alpha = .05$ level or below. Both the 1990–1998 population growth rate and aggregated growth management variables, however, were significant at $\alpha = .06$. As in the case of towns, the debt, tax rate, and equalized value variables were not related significantly to acres of rezoned agricultural land in cities and villages.

Conclusions

Our examination of the effects of growth management policies, specifically exclusive agriculture zoning, suggests that municipalities have only a limited ability to affect either population growth or the loss of farmland. In cities and villages, fiscal variables apparently influence population growth, primarily along the lines suggested by structuralists such as Peterson. Population growth tends to occur in areas with low tax rates and equalized value. In towns,

however, the relationship between fiscal characteristics and population growth rates appears to be weaker. The findings on the loss of farmland suggest that the use of exclusive agricultural zoning does not have a major impact, although towns seem to enjoy much more success with this policy than cities and villages. The fiscal situation of municipalities apparently does not have a strong effect on the amount of land that has been rezoned in the recent past. Existence of a capacity for growth management (i.e., land use plan, zoning, and coordination) proved to be largely unrelated to both population growth and loss of farmland.

Our study suggests that towns and cities/villages may experience different growth dynamics. The significant relationship between fiscal factors and population growth in cities and villages suggests that the institutional environment of these municipalities may influence growth differently than in towns. Furthermore, the ability to manage growth and preserve farmland may be quite different in the two institutional settings, as implied by the difference in effectiveness of exclusive agriculture zoning. Agricultural zoning as a tool for controlling the loss of farmland also may be limited because of the low income derived from farming. Unless farm operations near areas experiencing growth can be made more profitable, it will be very difficult to stem the loss of farmland in those communities.

As these provisional results make clear, greater attention must be given to the ways in which growth pressures play out in rural areas. Future research should examine diversity in institutional environments as well as in the kinds of issues, actors, and conflicts likely to predominate in rural settings. One institutional factor that is critically important in Wisconsin is the set of annexation laws that encourage towns to promote growth and development as a means of blocking annexation by cities and villages (Long 1998). Comparative research across states might be able to identify how these institutional factors set incentives for economic development and growth management policies.

Finally, the results contain important practical implications. Most officials continue to rely on zoning and other growth management policies to preserve farmland. Because of the suggestion that the effects of these policies are limited (although agriculture zoning may work marginally better in towns), old assumptions about the efficacy of these tools must be challenged. Local officials recognize increasingly that these policies are susceptible to political influences at the local level. At the same time, the effectiveness of growth management tools is affected by the tension between local autonomy and centralized controls, and by state and federal policies that encourage sprawl.

Other ways to encourage more dense development, such as more powerful regional planning authorities, are required in order to

meet the challenges facing rural areas. Several states, including Wisconsin, recently passed legislation requiring municipalities to develop land use plans. Yet fragmentation of local government authority may limit the effectiveness of this legislation. Greater coordination across regions will be necessary to curb the competition between municipalities and the tendency to externalize the costs of development.

This study is a preliminary effort to understand the role of local influences on farmland conversion. Additional research on this topic might take several directions. In our surveys we could not establish the relative influence of developers, farmers, local government officials, and others on the decision to rezone agricultural land. Comparative case studies may be required, which can illuminate when and how these forces operate. Researchers also might examine whether newer tools, such as the transfer of development rights, will exert any significant effect on the loss of farmland in rural areas.

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