

**THE DETERMINANTS OF PARTICIPATION IN LAND USE-RELATED
EDUCATION AND TRAINING: A CASE STUDY OF THE STATE OF
MICHIGAN**

By
Anne E. Cullen

A Plan B Paper

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Department of Agricultural Economics

2005

ABSTRACT

THE DETERMINANTS OF PARTICIPATION IN LAND USE-RELATED EDUCATION AND TRAINING: A CASE STUDY OF THE STATE OF MICHIGAN

By
Anne E. Cullen

In recent years, numerous policy makers and educators in Michigan have advocated increasing participation of land use planning officials in land use-related education and training. The Michigan Land Use Leadership Council, commissioned by Governor Granholm, recommended that 60% of planning and zoning officials complete basic land use planning, zoning, and smart growth educational programs by 2010. However, while demographic information has been gathered on planning officials, little empirical research has been conducted on the determinants of participating in land use education and training. This paper uses regression analysis to estimate and interpret a demand function for participation in land use-related education and training. Results indicate willingness to participate in land use-related training is a function of education, perceived benefit, and length in service. These findings have important programmatic and policy implications. Training programs should be geared towards those planning officials who are beginning to serve. Educators should focus on promoting and educating communities and planning officials on the potential benefits of land use-related training.

ACKNOWLEDGEMENTS

I would like to thank my committee, composed of Dr. John Staatz, Dr. Patricia Norris, and Dr. Satish Joshi. They provided me with constant guidance and encouragement, without which this project would not have been possible. For their unwavering support, I am truly grateful. I would also like to thank Wayne Beyea of the Citizen Planner Program and Dr. Christine Geith and Jerry Rhead of MSU Global for giving me the opportunity to work on this project. Each of them answered innumerable questions and provided constant support. Without the financial support of People and Land (PAL), none of this work would have been possible.

I am extremely grateful to Ricardo Labarta for help with econometrics and economic theory. Joe Martin provided me with greatly needed data and was extremely helpful in understanding the complexity of Michigan's tax assessments. I would also like to thank my family, friends, and classmates at Michigan State University for their encouragement. Finally, I would like to thank Gustavo Puente, the love of my life. His companionship, support, and optimism have sustained me throughout this project.

TABLE OF CONTENTS

LIST OF TABLES	V
CHAPTER 1 INTRODUCTION.....	1
CHAPTER 2 PROBLEM BACKGROUND.....	5
2.1 INTRODUCTION	5
2.3 RESEARCH ON PLANNING AND ZONING OFFICIALS DECISIONS & PREFERENCES .	9
2.4 RESEARCH ON LAND USE-RELATED TRAINING PROGRAMS	11
CHAPTER 3 LITERATURE REVIEW	12
3.1 INTRODUCTION	12
3.2 DEMAND FOR EXTENSION SERVICES.....	12
3.3 DEMAND FOR SKILLS TRAINING	14
3.4 ADOPTION OF NEW TECHNOLOGY	15
3.5 SUMMARY OF LITERATURE REVIEW	17
CHAPTER 4 MODEL SPECIFICATION.....	18
4.1 CONCEPTUAL MODEL	18
4.2 EMPIRICAL MODEL	19
4.3 METHODS	19
4.4 EXPLANATORY VARIABLES	20
CHAPTER 5 DATA	23
5.1 DEPENDENT AND EXPLANATORY VARIABLES.....	23
5.1.1 DEPENDENT VARIABLE.....	23
5.1.1 INDEPENDENT VARIABLES	23
5.2 SURVEY	24
5.2.1 <i>Determining Sample Size</i>	26
5.2.2 <i>Description of Survey Instrument</i>	26
CHAPTER 6 MODEL ESTIMATION AND ANALYSIS	28
6.1 INTRODUCTION	28
6.2 ANALYSIS OF DEPENDENT AND EXPLANATORY VARIABLES	28
6.2 DISCUSSION OF RESULTS	31
CHAPTER 7 SUMMARY AND CONCLUSIONS	34
APPENDIX.....	35

LIST OF TABLES

TABLE 1: COMPOSITION OF PLANNING COMMISSIONS AND ZONING BOARD OF APPEALS FOR CITIES, VILLAGES, TOWNSHIPS, AND COUNTIES	6
TABLE 2: MICHIGAN JURISDICTIONS' POSSESSION OF MASTER OR COMPREHENSIVE PLAN BY COMMUNITY TYPE.....	7
TABLE 3: SUMMARY STATISTICS OF VARIABLES WITH NUMERICAL VALUES FOR PROBIT MODEL.....	28
TABLE 4: SUMMARY STATISTICS OF VARIABLES WITH CATEGORICAL VALUES FOR PROBIT MODEL.....	29
TABLE 5: PROBIT ESTIMATION OF DEMAND FOR LAND USE-RELATED EDUCATION AND TRAINING.....	30
TABLE 6: ASSESSMENT OF THE PROBIT MODEL'S EXPLANATORY POWER BASED ON THE PERCENT CORRECTLY PREDICTED	30
APPENDIX TABLE 1: BREAKDOWN OF CITIZEN PLANNER PROGRAM SURVEY RECIPIENTS AND RESPONDENTS BY COUNTY	36
APPENDIX GRAPH 2: TOTAL TAXABLE VALUE (TV) AND STATE EQUALIZED VALUE (SEV) FOR 2000 AND 2003 FOR SAMPLE CITIES, TOWNSHIPS, AND COUNTIES	37
APPENDIX 3: CITIZEN PLANNER PROGRAM SURVEY INSTRUMENT.....	38

Chapter 1 Introduction

Land use decision makers in Michigan are being asked to weigh in on increasingly complex issues. Indeed, the dynamics of land use have been changing rapidly and dramatically. As development has moved into rural and suburban areas, many communities have found themselves ill-equipped to deal with the new growth. Unfortunately, poor or ill-informed decisions can result in long lasting and even irreversible consequences. All too often, land use decision makers are citizen planning and zoning commission members with little or no special training and education to assist them in their public roles. Commission members are usually interested citizens concerned about the future of their communities. As planning officials, they are charged with making decisions that will ultimately guide the economic and physical development of their communities. Sprawl development, congestion, growth management, and inner-city decay are but a few of the complex issues that face local planning officials. While some communities, particularly larger cities or towns, have full time planning professionals, many do not. Without professional planning assistance, the responsibility for determining planning and zoning falls solely upon commission members.

In Michigan, land use planning and decision making is particularly complex. Most of the state's planning and zoning acts were adopted prior to 1945 and have not been substantially changed since, despite significant technological advancements and population growth (MLULC 2004). These statutes give authority to 1857 local governments (counties, townships, cities, and villages) to make independent planning and zoning decisions. This makes coordination and consistency in planning and zoning across communities within Michigan very difficult. Equally troubling are recent survey

results revealing that many public officials surveyed did not know who was in charge of planning or zoning or if their community was engaged in zoning (IPPSR 2004).

Clearly, there is a growing need to provide education for Michigan's planning and zoning officials. Michigan has approximately 14,000 officials serving on planning commissions or zoning boards of appeals¹. The average planning official serves for two and a half years, which means the education needs are constant (Weising 1996). The large number of planning officials, lack of coordination between jurisdictions on planning and zoning efforts, and the short duration of service for planning and zoning officials complicates training and education efforts. In addition, planning officials serve in jurisdictions with varying levels and types of planning and zoning ordinances and begin their service with different skill levels.

Although the correlation between lack of planning and poor planning decisions has not been explicitly studied, it is widely believed by planning experts to exist. The Michigan Municipal Risk Management Authority recently released an instructional video for planning commissioners highlighting the importance of land use-related education and training in order to "avoid trouble." Indeed many planning consultants often advise communities about the need to engage in training in order to prevent future lawsuits. A 1993 Michigan Society of Planning newsletter stated "the quality of local planning throughout Michigan is enhanced by specific and appropriate education and training of volunteer citizen planners (Goldschmidt 1993)."

¹ The exact number of current planning officials is unknown as this information is not tracked by public or private institutions. This statistic is estimated based on what is authorized under Michigan statute. The authorized range of planning officials is from 12,000 to 18,000. 14,000 was used as a conservative estimate within this paper.

The Michigan Land Use Leadership Council, commissioned by Governor Granholm, recommended that 60% of planning and zoning officials complete basic land use planning, zoning, and smart growth educational programs by 2010. Fewer than 25% of planning officials in Michigan currently receive land use-related education and training. The two principal providers of land use-related education and training to Michigan's planning officials, Michigan State University Extension's Citizen Planner Program and the Michigan Society of Planning, have reached only 5700 citizen planners since 2000. Other organizations, the Michigan Association of Counties (MAC), the Michigan Townships Association (MTA) and the Michigan Municipal League (MML), conduct education and training programs for elected representatives of county, township, city and village governments, as well as other individuals who serve in public capacities. MTA reaches approximately 7000 individuals annually with its educational programs. However, most of those programs target elected officials and, according to MTA, reach few appointed officials. Given that elected officials comprise only 8%, or 1120, of Michigan's 14,110 planning officials, the total number of planning officials completing basic land use-related training is approximately 3000 per year.

Project Justification

Most research on planning is related to population growth, urbanization, minimum lot size, leasing public land, redevelopment, etc (Carrion-Flores and White). More specifically, empirical research is focused on the fundamentals of land use planning. Although a vast amount of research has been conducted on land use planning in general, there is little research on the determinants for participating in land use education and training. Researchers have typically gathered demographic and descriptive

information on officials and their communities. There is a lack of applied economic analysis to understand better the demand for land use-related education and training. Without knowing what serves as incentives for individual land use decision makers to participate in land use-related education and training, such programs may not reach their intended audiences.

Insight is needed into the positive and negative factors that affect planning officials' demand for land use-related education and training. Understanding what determines planning officials' demand for training could help local governments, educators, and the planning community to develop new policies to help promote participation in training. The findings could also both help predict demand for land use-related training and create more effective and appropriate training programs (Allen, McCormick, and O'Brien 1991).

Given this background, this paper uses regression analysis to estimate and interpret a demand function for participation in land use-related education and training. The analysis will be provided in the following manner. Chapter 2 provides an overview of land use decision making in Michigan. Basic definitions and concepts related to land use are presented. Current research on planning officials' behavior and trends in land use-related education and training are also presented. In Chapter 3, prior empirical research is described to provide a basis for a study of the determinants of participation in land use-related education and training. Chapter 4 describes the model specification used in this study and Chapter 5 describes the data sources. In Chapter 6, the model's results are presented. Finally, Chapter 7 provides a summary and conclusions for this study.

Chapter 2 Problem Background

2.1 Introduction

Michigan's Land Use Leadership Council's 2004 report cited that, on average, land in Michigan is developed at a rate eight times greater than the rate at which the population grows. With such an accelerated growth rate, the necessity for managed growth, and for planning and zoning, is clear. In this section of the paper, an overview of planning and zoning trends in Michigan and relevant research will be provided. However, first, basic definitions and concepts of planning and zoning will be presented. Within this paper, the term "planning official" refers to those appointed or elected officials involved in local government planning and zoning decisions.

2.2 Land Use Decision Making in Michigan

Land use planning is a method by which communities can manage and guide their future development. More specifically, land use planning is collective community decision making regarding the allocation of physical and financial resources that takes into account externalities generated by individual decision making. Which externalities to take into consideration through planning are therefore reduced to political decisions. The American Planning Association describes the goal of city and regional planning as furthering the "welfare of people and their communities by creating convenient, equitable, healthful, efficient, and attractive environments for present and future generations (2005)." Planning helps to ensure orderly growth and development for a community in an efficient manner that minimizes wasteful expenditures and reduces poor land use decisions. Simply put, land use planning is likely to lead to less costly growth patterns.

In the state of Michigan, Planning Commissions are advisory to legislative bodies and are charged with (1) making and adopting a comprehensive plan, (2) developing and recommending zoning, and (3) reviewing and/or approving new development (Heidemann 1997). Planning commissions, comprised of both appointed and elected officials who are appointed by the local legislative body (township board, city council, village council, or county board of commissioners) advise and give guidance on land use within the community. By Michigan statute, depending on jurisdiction type, a planning commission is authorized to serve on the Zoning Board of Appeals and members of the legislative body are authorized to serve on the Planning Commission. Table 1 presents an overview of how many planning commission and Zoning Board of Appeals members are allowed to serve according to jurisdiction type.

Table 1: Composition of Planning Commissions and Zoning Board of Appeals for Cities, Villages, Townships, and Counties

Type of Jurisdiction	Authorized Number of Members per Responsibility	Elected Officials serving on Planning Commission	Planning Commissioners serving on ZBA
Township PC*	5 to 9	1	
Township ZBA**	at least 3 (pop. < 5,000) at least 5 (pop. > 5,000)		1
County PC	5 to 11	1 to 3	
County ZBA	3 to 7		1
City PC	5, 7, 9	1	
City ZBA	at least 5	1	
Village PC	5, 7, 9	1	1
Village ZBA	at least 5	1	1

(County Zoning Act 1943; Township Zoning Act 1943; City and Village Act 1921; County Planning Act 1945; Municipal Act 1931; Township Planning Act 1959)

*PC- Planning Commission **ZBA- Zoning Board of Appeals

Developing and carrying out the comprehensive or “master” plan is the principal responsibility of Planning Commissions. The comprehensive plan provides a frame of reference for the planning commission and is “a tangible representation of what a community wants to be in the future (Kelly and Becker 2000).” Included within the comprehensive plan should be all the land area subject to the planning jurisdiction and all subject matter related to the physical development of the community. The comprehensive plan should have a time horizon of approximately twenty years to account for change and development within the community. Heidemann (1997) refers to Planning Commissions as “think tanks”, developing new and creative ideas for the community. This creativity can be manifested in the way in which the comprehensive plan is designed and written. There are 1227 jurisdictions in Michigan with a comprehensive plan in place. Table 2 presents Michigan jurisdictions’ possession of a master or comprehensive plan by community type.

Table 2: Michigan Jurisdictions’ Possession of Master or Comprehensive Plan by Community Type

		Type of Community				Total
		City	Village	Township	County	
Has your Community Adopted a Master or Comprehensive Plan?	Yes	255*	155	756	61	1227
	No	12	67	364	22	465
Total		267	222	1120	83	1692

(McGrain and Baumer 2003)

* Since McGrain and Baumer’s report was released, an additional city has adopted a master plan. This number reflects this addition.

A variety of planning and zoning acts written prior to 1945 permit, but do not require, planning and zoning for Michigan's local jurisdictions. The planning enabling acts require planning commissions, in communities that create them, to prepare and adopt a local comprehensive plan and also grant the authority for proposed subdivisions of land and public works projects (Wyckoff 1985). The planning and zoning acts are distinct for cities and villages, townships, and counties and have differing regulations and requirements. For example, the number and composition of members authorized to serve on city and village Planning Commissions is different than what is authorized for townships and counties. The term of service for all Planning Commission and Zoning Board of Appeals members is three years.

Zoning should not be considered separate or distinct from planning. Rather, zoning occupies an integral part of the planning process. Planning is the process by which a community determines its ideal development and zoning is the process by which the development is realized. Planning Commissions work in collaboration with Zoning Boards of Appeals and legislative bodies in making land use decisions. The legislative body is responsible for setting the local government policies and setting the budget for local planning. The legislative body adopts the zoning ordinance that regulates land use for the community. Fischel defines zoning as "the division of a community into districts or zones in which certain activities are prohibited and others are permitted (Fischel 1985)." Zoning can therefore be used to control actual development within these divisions. Examples of where and how zoning is used in communities are in restricting development in certain areas for wetland preservation or mandating minimum lot size

requirements. Similar to the Planning Commission, Zoning Board of Appeals members are appointed by the legislative body.

2.3 Research on Planning and Zoning Officials Decisions and Preferences

In 2004 the Institute for Public Policy and Social Research (IPPSR) conducted a 16-question survey designed to update a 1994 survey that described the status of local planning and zoning in Michigan. Using mailing lists obtained from Michigan Association of Counties (MAC), Michigan Municipal League (MML), and Michigan Townships Association (MTA), surveys were sent to county, municipal, and township clerks. A total of 1857 jurisdictions were surveyed and a 91.1% response rate was obtained.²

The IPPSR survey revealed that approximately 27% of all local governments do not have an existing master plan document. It is important to note, however, that 80% of these communities have a population fewer than 2,000. Taking the state as a whole, Southeast Michigan has the most communities with master planning documents (96%). For the rest of the state, the amount decreases moving north: Southwest (81%), East-Central (75%), West-Central (71%), Northern Lower Peninsula (58%), and Upper Peninsula (45%). Analyzing communities by jurisdictional type reveals that while 95% of cities have master plans; only 70% of villages, 68% of townships, and 73% counties do (McGrain and Baumer 2004).³

Seventy percent of Michigan communities have zoning ordinances in place. Regionally, 95% of Southeast Michigan communities have zoning ordinances on file, as

² Although McGrain and Baum report a 93% response rate in their article, a response rate of 91.1% was determined when using the figures from Table 2.

³ Again, these percentages differ from those reported in McGrain and Baum's 2004 report. They have been calculated using the figures from Table 2.

compared to 81% in Southwest, 79% in East-Central, 72% in West-Central, and 59% in Northern Lower and 59% in Upper Peninsula. Jurisdictional analysis reveals 97% of cities, 83% of villages, 83% of townships, and 30% of counties have zoning ordinances in place.

In 2002, Michigan State University's Victor Institute conducted a statewide survey of land use decision makers in Michigan. The survey contained 20 questions and was designed to "assess decision makers' perceptions of growth pressures, development trends, and land use resources." Mailing lists were obtained from the MAC and surveys were sent to county commission chairpersons (83) and 58 county planning commissioners. Using mailing lists obtained from MTA, surveys were also sent to township supervisors randomly selected from half of the townships within MSUE's regions. A final response rate of 59.2%, or 463 surveys, was obtained.

The average age of respondents was 56 years, with over 87.7% indicating they had been residents of Michigan for more than 31 years. Seventy-seven percent of respondents reported significant growth pressure in his/her county during the previous five years, and 76% indicated they believed this would be true for the next five years. More than 50% of respondents indicated that were concerned with growth issues including loss of farmland, beginning of suburban sprawl, and loss of forestland. Respondents' willingness to develop new policies, regulations, and incentives for protecting natural resources was assessed. The survey revealed that 64% of respondents were willing to consider strengthening junk/blight ordinances and adopting groundwater protection measures.

Respondents cited poor public understanding of land use issues as the most important barrier to meeting land use challenges. When asked to rank issues about which they would like to receive more information, land division/parceling and growth management were the top two for respondents. Many respondents noted, in written comments, that training is needed for people involved locally in land use planning and zoning.

2.4 Research on Land use-related Training Programs

The American Planning Association (APA) conducted a nationwide survey to determine the scope of planning official training programs (Chandler 2000). The study was designed to focus on five specific aspects: training format, target audience, topics covered, use of educational materials, and program evaluation. The results provide an overview of current practice. Although there are training programs for all experience levels, most training programs (61%) are designed for new planning officials. This suggests recognition of the need to provide basic information to new officials who do not have sufficient experience, skills, or information. Seventy-three percent of respondents use seminars and workshops for training that fit within a three-to-six hour block of time. This seems to indicate that, due to time constraints, planning officials prefer to participate in training that can be completed during a short period of time. More than 90% of participants used educational materials which could be retained for future reference. Finally, there is a real opportunity to improve the design of training activities, as 64.1% of programs provide participants an opportunity to critique the program upon completion.

Chapter 3 Literature Review

3.1 Introduction

As there is no research on the determinants of participation in land use-related education and training, research from related areas was reviewed and is described in the following section. This study selected research for examination based on two criteria: (1) it must be related in terms of subject matter and (2) it must be related in terms of empirical technique. First, the literature on the demand for extension services is vast and perhaps most closely related to the proposed research question. Second, theories on demand for skills training for both the employed and unemployed are analyzed. Finally, conceptual and empirical research on adoption of new technology is examined. Following the literature review is a short summary of the most relevant techniques and how they influence this research.

3.2 Demand for Extension Services

There are numerous examples of studies examining the demand for extension services (Wanmali 1991; Frisvold, Fernicola, and Langworthy 2001; Dinar 1989). These studies tend to be of two types: (a) determinants of demand for extension services and (b) pricing of extension services. Wanmali studies the determinants of demand for extension services in Zimbabwe, with the objective of improving policy content for the distribution of rural infrastructural services to the smallholder communal farming sector. In modeling demand, data on the following cost factors were collected: number of trips made to use an extension service, distance traveled per trip, trip time, money spent on travel, money spent on extension service, and mode of transport (Wanmali 1991).

To determine the supply of and demand for extension services, Frisvold et al. estimate two model specifications using the three-stage least squares method. Requests for (R_i) and provision of (P_i) extension services are simultaneously determined:

$$R_i = f(P_i, S_i, C, T, F, \mathbf{D})$$

$$P_i = g(R_i, V_i, E, C, \mathbf{D})$$

where S is market size (measured as revenues for a particular commodity), C is communication services (measured by the number of telephones in the state per thousand persons), T is transportation services or a measurement of access to extension services (measured by the number of motor vehicles registered in the state per thousand persons), F is number of farms, V is the number of community volunteers assisting extension staff on a given commodity, E is the size of the extension staff (measured as total agent staff months), and \mathbf{D} is a vector of dummy variables for commodity groups. In the first model, extension service provision is measured by site visits and in the second model, extension agent staff-days are used to measure extension service provision.

In estimating willingness to pay for extension services that had once been free, Dinar (1996) calculates the per hectare value added for each agricultural activity by subtracting the total production costs from the revenue. To calculate maximum willingness to pay, activities were arranged according to the per hectare value added and the per hectare value added multiplied by the volume of each activity. Dinar thus obtained a “declining step function” which provided a proxy for the value farmers might be willing to pay for extension services by crop. By dividing by the number of extension visits, the average price farmers would be willing to pay was calculated (Dinar 1996).

3.3 Demand for Skills Training

Rupasingha et al.⁴ (2000) use a human capital approach in examining individuals' willingness to participate in skills training in the rural South. Their model assumes an individual's decision to participate in training is based on expectations about the future. Using the Von Neuman and Morgenstern expected utility theorem, these expectations are incorporated into a utility maximization framework. The authors do not include a cost variable in their model and assume wages forgone are the only additional cost of participating in training. Rupasingha et al. assume individuals will participate in skills training programs if the perceived marginal utility from participation minus the opportunity cost of doing so is positive.

Rupasingha measured individuals' willingness to participate in training by the answer to the following question, "Many people in business and government think that in the future workers will need to retrain to keep up with changes in the workplace. How interested are you in learning new skills or technology?" A logistic regression model was used to model participation in skills training. Explanatory variables included socioeconomic and demographic factors, job characteristics, community factors, and perception of skills training. Perception of skills training was measured by responses to two survey questions: (1) a respondent believes there is a connection between skills training and receiving a new job and (2) whether a respondent felt skills training would improve his/her standard of living.

⁴ This section draws heavily from Rupasingha et al. referenced at the end of this paper.

Allen et al. (1999) studied an unemployed individual's demand for retraining as compared to not participating in training and waiting to receive a job similar to what he/she had before becoming unemployed.

$$P_{ST} = f(\tau, u, c, w, r)$$

In their conceptual model, the probability of seeking retraining is a function of the expected duration of employment, τ ; the difference in utility between working in the last job and unemployment, u ; cost of training, c ; difference in wage between post and pre-trained position, w ; and years to retirement, r . The cost of training is represented by the direct cost of the training course, the "indirect psychic costs" which could result from training-induced stress, and the difference between a trainee's and a trained worker's wage (Allen 1991).

Unemployed individuals' decisions to seek retraining were measured by responses to the following question: "Have you sought to join a training or retraining program since becoming unemployed?" The authors determined a logit model would be unable to account for the influence of length of employment and thus a maximum likelihood model was used.

3.4 Adoption of New Technology

Although the literature on adoption of new technology is not directly related to this research, it provides valuable insight into the appropriate empirical technique. The factors determining adoption of new technology are likely similar to the factors determining willingness to participate in land use-related education and training.

Wozniak (1987) presents a model of early adoption behavior from a sample of Iowa farmers. Logit and probit models are used to analyze the adoption of a new technology,

the cattle feed additive monensin sodium (MS). Wozniak assumes the risks and fixed costs of adoption deter farmers from adopting new technology. In order to reduce risk, early adopters must have greater access to information from agricultural extension service and agricultural supply firms. The author hypothesizes that the cost of not adopting an innovation increases with production scale. The inherent logic of this hypothesis is that large scale farmers have greater incentive to seek and adopt new techniques. Wozniak's conceptual model is as follows:

$$\text{Prob (adoption} | x_i) = \text{Prob}[\Delta\pi(.) > 0] = F(x_i\beta),$$

where x_i is the vector for the i th farmer and $F(.)$ is the cumulative distribution function. The probability of a farmer adopting a new technology is expressed as a function of his education and experience, access to information, and production scale. Independent variables include: years of schooling completed by farm operator, amount of time a farmer has farmed independently, number of head of cattle fed on the farm that were sold for slaughter in a given time period, amount of contact with agricultural extension, and amount of contact with private agricultural supply firms.

In analyzing the adoption of Green Revolution varieties of rice in major rice-producing regions of Guyana, Shaw develops two explanatory models of adoption. The first model rests on the assumption that the success of new rice varieties depends upon a controlled system of water supply which is determined by government institutions. The relevant variables include (1) accessibility to drainage and irrigation canals and (2) the quality of existing facilities, judged by failures resulting from poor water control.

Shaw's second model tests the relative importance of individual characteristics and communication behavior for adoption. Explanatory variables included (1)age; (2)

farm experience; (3) family size; (4) education level; (5) changes in farm practice within past four years; (6) changes farmer would implement if loans were received; (7) contact with extension agents; and (8) visits to demonstration plots.

3.5 Summary of Literature Review

The research presented above was selected to demonstrate the empirical techniques that have been used in analyzing similar topics. Detailed information on how the models were specified was described to identify relevant explanatory variables. Perhaps most relevant to the research at hand is the literature on skills training and the adoption of new technology. Rupasingha et al.'s study on skills training is the most similar in form and substance. Interestingly the explanatory variables do not include a cost variable. Rather, demand for skills training is measured by demographic, job characteristics, community factors, and perception of skills training. The adoption of new technology literature suggests the most appropriate technique for modeling demand for land use-related education and training would be a limited dependent variable model.

Chapter 4 Model Specification

4.1 Conceptual Model

The following equation provides the basis for the empirical analysis in this paper:

$$D_t = f(B_t, C_t, K, S)$$

where t is training, D is the willingness to participate in land use-related education and training, B is the benefit received as a result of participating in training (which can also be seen as the reduction of risk of poor planning decisions resulting from lack of training and education), C is the cost of participating in training, K is the community's ability to pay for training, and S is the vector of demographic shifters.

Determining participation in training requires calculating benefits and costs. In addition to the cost of the training activity, the individual planning official also weighs his opportunity cost for participation. For those officials with primary employment, the opportunity cost might be the wages forgone. For retired officials, their opportunity cost might be forgone leisure time. Another relevant factor is the travel cost in attending the training.

It is important to note, however, the empirical model does not include cost as an explanatory variable. As was seen in some of the research presented in the literature review (Frisvold and Rupasingha et al.), estimating cost for demand models of this type (for new programs or ones without charges) can be quite challenging. The survey data used for this study did not include questions related to cost. Determining willingness to pay based on opportunity cost of the participants was not possible due to two reasons. Questions related to employment and salary were not included in the survey, so wages forgone for participation in training is unknown. Also, it is impossible to measure cost in

terms of distance traveled as the residence (or even community) of respondents is not known.

4.2 Empirical Model

A probit model will be used to examine the determinants of participation in land use-related education and training. The probit model is specified as:

$$\begin{aligned} y_i &= F(X_i\beta) + \varepsilon_i \\ &= \int_{-\infty}^{X_i\beta} f(X_i\beta) + \varepsilon_i \end{aligned}$$

where Y_i equals one if willing to participate in land use-related training and education and Y_i equals zero if unwilling to participate in land use-related training and education, X_i is a matrix of observed explanatory variables, β is a vector of coefficients to be estimated, and ε_i is a normally distributed stochastic error term.

It is important to note the choice to use a probit over a logit model was a result of the author's personal preference. Woolridge (2000) states there is no good criterion for choosing between probit and logit models and the empirical results are very similar. Woolridge further states probit models are more popular than logit models in econometric studies due to the normality assumption for the error term.

4.3 Methods

The land use-related training demand model was estimated using the Stata 8.0 software package. A heteroskedastic probit model was used and after estimation, the model was tested for heteroskedasticity, multicollinearity, goodness of fit, and endogeneity.

Greene (2003) states the consequences of heteroskedasticity are more serious in probit models than with linear regression. In the latter case, the estimator is still unbiased and consistent even though it becomes inefficient. However with probit models, heteroskedasticity causes maximum likelihood estimates to be inconsistent and the covariance matrix is inappropriate (Greene 2003). Greene goes on to state, “this is particularly troubling because the probit model is most often used with microeconomic data, which are frequently heteroskedastic (pg. 679).”

Therefore, to eliminate the negative consequences of heteroskedasticity, a heteroskedastic probit model was run. The heteroskedastic probit model tests the full model of heteroskedasticity against the full model without heteroskedasticity.

4.4 Explanatory Variables

In his study on models of technology diffusion, Geroski (2000) states “the trick with probit models is to identify interesting and relevant characteristics.” This author has attempted to do just that in order to model participation in land use-related training. Willingness to participate in zoning and planning-related training and education is a function of a variety of factors.

One such factor is perceived benefit. Some participants receive a stipend, e.g. \$15/mtg., from their community for participating in training. Planning officials might value the skills and knowledge they receive from participating in training. Similarly, the communities in which they serve benefit as a result of better informed planning decisions. More informed decisions can translate into economic savings for the communities, as less money is spent on lawsuits that can come as a result of poor planning. Reducing the risk

of costly litigation would serve as incentive for participation in land use-related education and training.

This model measures perceived benefit rather than actual benefit as people's actions are based on their perceptions. If a planning official is interested in participating in land use-related training because he believes the benefit will be increased understanding of planning issues, this is the indicator of benefit that affects participating in training. It is expected that perceived benefit will have a positive influence on willingness to participate in land use-related education and training. As the perceived benefit of participating in training increases, so will willingness to participate.

As mentioned in the above discussion, it is often the smallest and more rural communities that do not have professional planners or staff and therefore rely on their planning and zoning officials. It follows logically that these may also be poor communities without the resources with which to pay for training and education. Recent Michigan state financial problems have resulted in drastic budget cuts for communities. In many cases, training and education are the first activities that are eliminated due to budget problems (Croner 2003). A positive relationship between capital (financial resources) and willingness to participate in training is anticipated. If a community has the resources to pay for planning officials to participate in training, the number of planning officials receiving land use-related education and training will increase.

There is a variety of demographic information that must be included when determining demand for training and education. What is the age of the planning official? Younger officials might be more willing to participate in training than people who have long since left the classroom. What is the education level of the planning official? Those

officials who have had more education might be more receptive to additional education. Or, conversely, those planning officials with more education could feel they don't need more training. How many years has the person served as a planning official? More experienced officials might feel more knowledgeable and less in need of training. What is the planning official's skill level as a planning official? Again, those with a greater skill level might need less training than a new official. What is the population growth in the community? A community that is currently experiencing growth pressure might feel the need for training to help manage that growth.

Chapter 5 Data

5.1 Dependent and Explanatory Variables

The vast majority of the data used for this research was gathered with a 2004 survey conducted by Michigan State University's Citizen Planner Program. The survey was designed to gather both demographic information and information on the education and training preferences of planning officials in Michigan. Although the survey had 410 responses, only 353 observations were used for this research because the precise geographic location of the remaining observations was unknown. The data sources for explanatory variables will be described in detail in the following section.

5.1.1 Dependent Variable

Willingness to participate in land use-related education and training will be measured by the yes/no answer to the following question: "Do you believe that planning officials should be required to receive training in order to serve as a planning official?" If planning officials feel training is important enough to believe it should be a requirement for serving, logically it follows that they would be willing to participate in such training.

5.1.1 Independent Variables

Perceived benefit from training will be measured from data gathered in the Citizen Planner Program survey. The responses (strongly interested, somewhat interested, not very interested, not at all interested) from the following statement will be used: I would participate in training that helps me do my job better.

The ability of an individual community to participate in training (financial resources) will be calculated using the total taxable value for real property in the

jurisdiction. This data comes from the 2003 Ad Valorem Property Tax Levy Reports compiled by the Michigan Department of Treasury State Tax Commission.⁵ To account for growth, a variable measuring increases in taxable value resulting from new development and property exchanges will be created by calculating the difference in taxable value from 2000 to 2003. This variable will capture the effects of growth and associated changes in jurisdictions' fiscal capacity.

Finally, all demographic data will be drawn from the survey: age, length of service, skill and education level of respondents, and population growth of their communities. Survey respondents indicated if they had a high school degree, some college, associates degree, undergraduate degree, some graduate courses, some graduate courses, or graduate degree. Skill level was measured by four categories: I'm just starting out and have much to learn; I can do what I need to do quite well, but there's more I need to learn; I have a broad range of knowledge and experience in this field; and I have in-depth and significant knowledge and experience in this field and do not need additional training.

5.2 Survey

The Citizen Planner survey was designed to gain information on the education and training preferences of Michigan's planning and zoning officials. It was determined that surveys would be sent only to those jurisdictions with existing master planning documents, of which there are 1227 jurisdictions. The inherent logic was that jurisdictions without a master planning document would not be interested in receiving

⁵ It is important to note that changes in State Equalized Value (SEV) is a better measure of a jurisdiction's growth, since Taxable Value (TV) is constrained annually by 5% or the rate of inflation (whichever is smaller). However, SEV data was not available for villages. Appendix Graph 5 presents a graph demonstrating the difference between SEV and TV.

planning and zoning-related training and education. The first task assigned to planning commissions is to establish a master plan. Therefore, if a master plan is not in place, it can be assumed the jurisdiction is not involved in planning. The IPPSR survey revealed that, of the 1227 jurisdictions with master planning documents, 20% were cities, 13% villages, 62% townships, and 5% counties. The developers of the survey wanted the survey sample to reflect the actual composition of jurisdiction type and have the Citizen Planner survey respondents reflect the real-world composition. A stratified sampling procedure was therefore developed following the above proportions: 20% of 953 surveys were mailed to cities, 13% to villages, 62% to townships, and 5% to counties.

A 23 question survey for Michigan planning and zoning officials was developed. As the average length of service for planning officials is very short, a list of planning and zoning officials in Michigan does not exist. Moreover, there is neither a mailing nor phone list of all planning commissions in the state. After great deliberation about the best method for reaching planning officials, it was decided that surveys would be mailed to jurisdictional clerks. The clerks were asked to identify a member of the jurisdiction's planning commission to receive the survey. Address information for jurisdiction clerks was compiled from the member directories of the Michigan Municipal League, the Michigan Townships Association, and the Michigan Association of Counties.

Surveys were sent to 953 identified clerks on July 9, 2004. For tracking purposes, the return envelope contained a code (T for township, C for city, CO for county, and V for village). It was important to have a record of those jurisdictions that didn't respond so that a follow-up postcard could be sent. However, it was also important to maintain the anonymity of survey respondents. Therefore, at all times the name of the

jurisdictional clerk was kept in a separate location from the tracking code. A follow-up postcard reminding clerks of the survey was sent to non-respondents on July 29. A total of 410 surveys was received, for a response rate of 43%.

5.2.1 Determining Sample Size

The following formula for determining sample size was used:

$$SS = Z^2 * (p) * (1-p) / C^{26}$$

where:

SS = sample size for infinite population

Z = Z value (e.g. 1.96 for 95% confidence level)

p = percentage of "yes" respondents, expressed as a decimal (.5)

C = confidence interval, expressed as decimal (e.g., .04 = ±4)

$$SS = (1.96)^2 * (.5) * (1-.5) / (.05)^2 = 384.16$$

384.16 is the sample size needed to reach a 95% level of confidence.

The correction for finite population is:

$$\text{New SS} = SS / 1 + ((SS-1)/\text{pop})$$

where pop = population

$$\text{New SS} = 384.16 / 1 + ((384.16-1)/14000) = 373.9$$

Assuming that a response rate of 40% could reasonably be expected, it was determined that 953 planning officials would be surveyed.

5.2.2 Description of Survey Instrument

The survey packet mailed to jurisdictional clerks included: (1) a letter for the clerk describing the purpose of the survey and asking for a planning official to be identified, (2) a letter describing the survey for the identified planning official, (3) the survey instrument (see Appendix 6) , and (4) an addressed stamped envelope.

⁶ The formula for determining sample size came from: <http://www.surveysystem.com/sscalc.htm>

Appropriate University Committee on Research Involving Human Subjects (UCRIHS
IRB#04507) information was also included in the letter.

Chapter 6 Model Estimation and Analysis

6.1 Introduction

This chapter first presents the summary statistics for the dependent and explanatory variables, and then it presents and analyzes the regression results for the probit model. It should be noted that one of the explanatory variables described in previous parts of the paper were not included in the final regression model because they added little to the explanatory power of the model specification. Specifically, the growth variable is missing from the regression output. It is also important to note that all of the data in this study except for age, taxable value, and change rate are categorical variables. Summary statistics of the dependent and explanatory variables can be found in the appendix of this paper.

6.2 Analysis of Dependent and Explanatory Variables

The following tables present summary statistics of the dependent and explanatory variables used in the model.

Table 3: Summary Statistics of Variables with Numerical Values for Probit Model

Variable Abbreviation	Variable Description	Mean	Min	Max
Age	Age of respondents	56.2	22	84
TV	Total taxable value	2.84E+08	2581528	8.63E+09

Table 4: Summary Statistics of Variables with Categorical Values for Probit Model

Variable Abbreviation	Variable Description	Percentage**
Willing	Willingness to participate in land use-related training/education	71%
Education1	Less than Grad/Professional degree	80%
Education2	Graduate/Professional degree	20%
Skill1	Skill level- I'm just starting out and have much to learn	10%
Skill2	Skill level- I can do what I need to do quite well, but I need to learn more	61%
Skill3	Skill level- I have a broad range of knowledge and experience	24%
Skill4	Skill level- I have in-depth and significant experience	2%
Length	Length of service - Less than one year	6%
	1-3 years	25%
	4-6 years	25%
	7-10 years	14%
	10 or more years	28%
Benefit1	Perceived benefit- Strongly interested in training that helps me do my job better	61%
Benefit2	Perceived benefit-Somewhat interested in training that helps me do my job better	28%
Benefit3	Perceived benefit-Not very interested in training that helps me do my job better	3%
Benefit4	Perceived benefit-Not at all interested in training that helps me do my job better	1%

*Indicates percentage of surveying respondents answering “yes” or indicating agreement to the corresponding question (Yes=1, No=0) .

**Some of the percentages for explanatory variables do not sum to one hundred due to survey respondents who did not respond to particular questions.

A standard probit model was estimated and results are presented in Table 5. The Likelihood Ratio is 31.34 and significant at a one percent level ($p=.0005$), indicating all the explanatory variables are jointly significant. Furthermore, four of the six explanatory variables were found to be significant at a ten percent level and one at a five percent level. However, as the Psuedo R^2 (7.62) is low, there is a need to further investigate the

goodness of fit of the model. Woolridge (2000) suggests using the percent correctly predicted as an alternate measurement of goodness of fit. The results of the percent correctly predicted statistic are shown in Table 6.

Table 5: Probit Estimation of Demand for Land Use-Related Education and Training

Probit Model			
Variable Name	Estimated Coefficient	Marginal Effects	P-Value
Intercept	-0.23		0.69
TV	-2.70E-10	-8.84E-11	0.03**
Age	0.01	0.0	0.41
Length	-0.12	-0.04	0.05**
Education	0.4	0.12	0.06**
Skill1	0.2	0.1	0.64
Skill2	0.34	0.11	0.36
Skill3	0.55	0.16	0.15
Benefit1	0.77	0.26	0.01*
Benefit2	0.26	0.08	0.42
Benefit3	0.27	0.08	0.59

[Pseudo R²=7.62, Likelihood Ratio=31.34]

* = Significant at a 5% level, ** = Significant at a 10% level

Table 6: Assessment of the Probit Model’s Explanatory Power based on the Percent Correctly Predicted

Positive predictive value	74.1%
Negative predictive value	65.2%
Correctly classified	73.6%

This model correctly predicts willingness to participate in land use-related education and training 74.1% of the time. The model also predicts unwillingness to participate in land use-related training 65.2% of the time. Overall, the model correctly classified willingness to participate in training 73.6%. The closeness between the positive and

negative predictive value and the size of the overall level of this test indicates the model has a relatively good fit.

The model was tested for multicollinearity by calculating the variance influence factors for the variables specified in the fitted model. The resulting statistic was 2.94, less than the critical value, and therefore we fail to reject the null hypothesis of no multicollinearity. A heteroskedastic probit model was run and the resulting likelihood ratio statistic (.01) was found to be insignificant ($p=.9$). Therefore we fail to reject the null hypothesis of no heteroskedasticity. The model also tested negative for endogeneity using the Hausman test for endogeneity.

6.2 Discussion of Results

Four of the six explanatory variables were statistically significant: taxable value, length of service, education, and perceived benefit. The percent correctly predicted showed the model has a good prediction rate for both willingness and unwillingness to participate in land use-related education and training. The interpretation of the coefficient signs for the statistically significant explanatory variables follows.

The variable for length of service was found to be statistically significant at a ten percent level ($p=.06$). The coefficient for length of service is negative, suggesting that as length of service increases, willingness to participate in land use-related training decreases. This result supports the hypothesis that planning officials serving for long periods of time (more than 10 years) feel they are knowledgeable about the field and do not want additional education. This result might indicate that a planning official who has served for long periods of time perceives less benefit from land use-related education and training.

To gain more insight into this relationship, a cross tabulation analysis of length of service and perceived benefit (training would help the planning official do his/her job better) revealed that 65% of planning officials who are not interested in training to help do his/her job better are planning officials with more than 10 years of service. Cross tabulation analysis of length of service with all perceived benefit variables revealed that planning officials with more than 10 years of service were always the least interested in land use-related education and training. This may reflect the view that the training programs offered only cover the basics, while the more experienced officials want advanced topics.

The variable for those planning officials with the highest perceived benefit (strongly interested in land use-related education or training that helps me do my planning/zoning job better) was found to be statistically significant at a one percent level ($p=.01$) compared to those planning officials with the lowest perceived benefit (not at all interested in land use-related education or training that helps me do my planning/zoning job better). The findings indicate that perceived benefit increases the probability of willingness to participate in land use-related education and training. This result supports the initial hypothesis that as perceived benefit increases so does willingness to participate. If planning officials perceive the benefit from participation in land use-related education and training to be high, they will be more interested in participating than if they perceive the benefit to be low.

The variable for planning officials with graduate education was found to be significant at a ten percent level (.06) compared to those planning officials with lesser levels of education. Although the coefficient for graduate education was positive, this

does not indicate that as the level of education increases, so does willingness to participate in land use-related education and training. There was not an incremental increase in willingness to participate with increases in education level. Rather, it is only those planning officials with graduate education who are significantly more willing to participate in training, as compared to planning officials with less education (high school degree, some college, associates degree, undergraduate degree, and some graduate courses). To gain better understanding into this relationship, cross tabulation analysis was conducted on the education and length of service variables. Of those planning officials with a high school degree as the highest level of education obtained, more have served for ten or more years than for any other length of time.

The variable for taxable value was found to be significant at a five percent level. The results indicate that as taxable value increases willingness to participate in land use-related education and training decreases. This finding is the opposite of what was originally hypothesized. It was believed that as taxable value increases, jurisdictions would have more resources with which to participate in land use-related education and training and, thus, willingness to participate in such training would increase. However, wealthier jurisdictions tend to have more regulations and land use controls and have the resources to contract professional planners and consultants. On the other hand, less wealthy jurisdictions rely more heavily on the input of their planning commissions.⁷ Given this background, these findings appear to indicate that less wealthy jurisdictions would be more likely to have planning commissioners who are willingness to participate in land use-related education and training.

⁷ Citizen Planner Program Executive Director, Wayne Beyea, gave evidence and justification for this assertion in personal communication on April 22, 2005

Chapter 7 Summary and Conclusions

This paper has examined the determinants of willingness to participate in land use-related education and training. Results of the probit model support many of the initial hypotheses and suggest that willingness to participate in land use-related training is a function of education, perceived benefit, and length in service. Planning officials with graduate education are more willing to participate in land use-related training than those with lower levels of education (high school, some college, associates degree, undergraduate degree, and some graduate courses). Similarly, those planning officials with higher levels of perceived benefit of participating in land use-related training are more willing to participate than those with lesser levels of perceived benefit. Interestingly, the longer a planning official serves the less interested he/she is in participating in land use-related education or training.

The results of this research have important programmatic and policy implications. Training programs should be geared towards those planning officials who are beginning to serve. New planning officials have the most interest in participating in land use-related training as they want access to information and skills that will prepare and equip them to perform their jobs more effectively. Therefore, training programs should be introductory in nature and geared towards matching novice planning officials' needs.

If educators wish to gear training programs towards planning officials who have served longer lengths of time, ten or more years, the content of these programs should be altered accordingly. Qualitative information gathered from focus groups conducted by the Citizen Planner Program revealed planning officials with many years of experience feel they can not benefit from land use-related training because they have on-the-job experience. However, it may be that these officials could benefit from in-depth or

advanced continuing education courses. If these programs were targeted to the “experienced” planning official and marketed accordingly, this might increase willingness to participate.

Results from this research highlight the importance of clearly marketing the benefits from participation in training. If planning officials strongly believe in the benefits from participating in training, they will be more likely to participate. Educators should focus on promoting and educating communities and planning officials on the potential benefits of land use-related training.

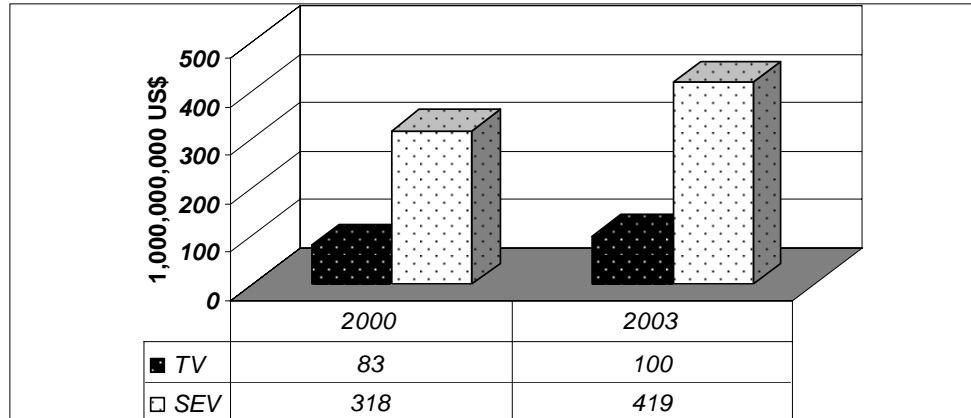
One of the major limitations of the survey data used for this study is the omission of a cost variable that would capture willingness to pay. It would be worthwhile to obtain such data for subsequent research in order to determine willingness to pay estimates for training. Such information would provide organizations offering land use-related education and training with valuable information on how to price their products.

Another important limitation of this study is the short period of time, 2000 to 2003, for the growth rate variable. Due to data unavailability, only three years could be used for this study. In future studies, additional years should be used to capture the long term effects of growth and changes in jurisdictions’ growth. More importantly, as noted in the data chapter of this paper, future research should include State Equalized Value (SEV) instead of Taxable Value (TV) when measuring fiscal capacity. As TV is artificially constrained annually at 5% or the rate of inflation (whichever is lower), this variable does not give an accurate measure of the growth in a jurisdiction.

Appendix Table 1: Breakdown of Citizen Planner Program Survey Recipients and Respondents by County

Breakdown of Survey Recipients by County							
County	Surveys Mailed	Surveys Returned	Percent Returned	County	Surveys Mailed	Surveys Returned	Percent Returned
Alcona	6	4	0.67	Lake	6	2	0.33
Alger	4	1	0.25	Lapeer	22	12	0.55
Allegan	24	4	0.17	Leelanau	12	6	0.50
Alpena	3	2	0.67	Lenawee	19	3	0.16
Antrim	9	4	0.44	Livingston	14	4	0.29
Arenac	8	4	0.50	Luce	1	1	1.00
Baraga	1	0	0.00	Mackinac	5	1	0.20
Barry	6	4	0.67	Macomb	17	6	0.35
Bay	15	6	0.40	Manistee	11	4	0.36
Benzie	10	5	0.50	Marquette	14	4	0.29
Berrien	25	9	0.36	Mason	4	3	0.75
Branch	11	4	0.36	Mecosta	8	2	0.25
Calhoun	20	6	0.30	Menominee	1	0	0.00
Cass	14	5	0.36	Midland	13	7	0.54
Charlevoix	16	7	0.44	Missaukee	2	1	0.50
Cheboygan	2	0	0.00	Monroe	11	3	0.27
Chippewa	7	1	0.14	Montcalm	14	4	0.29
Clare	7	7	1.00	Montmorency	7	2	0.29
Clinton	16	5	0.31	Muskegon	22	8	0.36
Crawford	7	2	0.29	Newaygo	18	9	0.50
Delta	6	3	0.50	Oakland	41	11	0.27
Dickinson	4	2	0.50	Oceana	12	6	0.50
Eaton	10	7	0.70	Ogemaw	1	0	0.00
Emmet	7	2	0.29	Ontonagon	4	1	0.25
Genesee	27	11	0.41	Osceola	8	3	0.38
Gladwin	5	1	0.20	Oscoda	3	1	0.33
Gogebic	2	1	0.50	Otsego	3	1	0.33
Grand Traverse	14	8	0.57	Ottawa	17	5	0.29
Gratiot	10	6	0.60	Presque Isle	7	2	0.29
Hillsdale	4	2	0.50	Roscommon	7	3	0.43
Houghton	6	1	0.17	Saginaw	25	9	0.36
Huron	17	7	0.41	Sanilac	18	6	0.33
Ingham	16	4	0.25	Schoolcraft	1	0	0.00
Ionia	12	4	0.33	Shiawassee	19	7	0.37
Iosco	8	2	0.25	St Clair	19	7	0.37
Iron	1	1	1.00	St Joseph	12	1	0.08
Isabella	10	1	0.10	Tuscola	22	7	0.32
Jackson	16	7	0.44	Van Buren	19	4	0.21
Kalamazoo	16	8	0.50	Washtenaw	19	8	0.42
Kalkaska	3	0	0.00	Wayne	35	12	0.34
Kent	25	12	0.48	Wexford	5	4	0.80
Keweenaw	5	1	0.20				
Total Respondents= 353 Total Counties=79							

Appendix Graph 2: Total Taxable Value (TV) and State Equalized Value (SEV) for 2000 and 2003 for Sample Cities, Townships, and Counties*



*Village data are not included in TV or SEV as this data is not available at the village level.

Appendix 3: Citizen Planner Program Survey Instrument

Michigan State University Citizen Planner Program A Survey for Michigan Planning Officials

For each question, check or circle the answer(s) that best applies to you in your role as a planning official. For this survey, we use “planning official” to describe all appointed and elected officials involved in local government planning and zoning decisions.

Demographic Data and Professional Status

The purpose of this section is to help us learn about planning and zoning officials in Michigan.

1. **In what year were you born?** _____

2. **What is your education level? (check one)**
 - a. High school degree
 - b. Some college
 - c. Associates degree
 - d. Undergraduate degree
 - e. Some graduate courses
 - f. Graduate/Professional degree

3. **Which of the following best describes your role as a planning official?**
 - a. I am an (check one)
 - elected
 - appointed
 - b. member of a (check all that apply)
 - planning commission/zoning board
 - zoning board of appeals
 - c. chairperson of either a planning commission/zoning board or zoning board of appeals
 yes
 no

4. **How long have you been in this role? (check one)**
 - a. Less than one year
 - b. 1-3 years
 - c. 4-6 years
 - d. 7-10 years
 - e. 10 or more years

5. **From which organizations do you receive planning-related education and training? (check all that apply)**
 - a. Michigan Association of Counties
 - b. Michigan Farm Bureau/Farmland & Community Alliance
 - c. Michigan Municipal League
 - d. Michigan Society of Planning
 - e. Michigan State University Extension
 - f. Michigan Townships Association
 - g. Planning and Zoning Center
 - h. Other (describe)_____

6. **Which of the following best describes your skill level as a planning official? (check one)**
- a. I'm just starting out and have much to learn.
 - b. I can do what I need to do quite well, but there's more I need to learn.
 - c. I have a broad range of knowledge and experience in this field.
 - d. I have in-depth and significant knowledge and experience in this field and do not need additional training.
7. **There has been significant growth pressure in my county during the past five years.**
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
8. **Growth pressure in my county will increase significantly in the next five years.**
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree

Education and Training Opportunities

The purpose of this section is to help us learn about the kinds of education and training opportunities that are useful to Michigan planning officials.

9. **Does your jurisdiction have a budget that pays for planning-related education and training?**
- Yes
 - No

If yes, what would you estimate your municipality's annual planning-related training budget to be? _____

10. **How would you rate the importance of participating in ongoing planning-related education or training?**
- a. Essential
 - b. Important
 - c. Nice to have
 - d. Unnecessary

11. In what types of planning-related education or training are you most interested?
For each of the following, circle the number that best indicates your level of interest.
 (4 = Strongly Interested; 3 = Somewhat Interested; 2 = Not Very Interested; 1 = Not at all interested)

I would participate in planning/zoning-related education or training that...				
Helps me do my planning/zoning job better	4	3	2	1
Makes my planning/zoning job easier or less painful	4	3	2	1
Makes me feel that I'm making a positive difference	4	3	2	1
Prevents or reduces lawsuits by helping me make more informed, knowledgeable decisions	4	3	2	1
I would like to have access to the following planning/zoning-related education resources:				
An online resource library which has general information	4	3	2	1
Information updates from reliable sources about pertinent developments in the field	4	3	2	1
A database of recent and pending lawsuits	4	3	2	1
A database of examples of planning and zoning	4	3	2	1

12. For each of the activities listed below indicate your level of interest as it relates to helping you become a better planning official.
 (4 = Strongly Interested; 3 = Somewhat Interested; 2 = Not Very Interested; 1 = Not at all interested)

Having real-world problem-solving opportunities	4	3	2	1
Sharing stories with peers	4	3	2	1
Double-checking my understanding of the field with peers	4	3	2	1
Double-checking my understanding of the field through books or other references	4	3	2	1
Being able to network with my peers in person	4	3	2	1
Being able to network with my peers by phone	4	3	2	1
Being able to network with my peers online	4	3	2	1
Having the opportunity to develop professional relationships with my peers	4	3	2	1
Getting useful answers to urgent questions	4	3	2	1

Education and Training Delivery Options and Considerations

The purpose of this section is to help us learn more about your preferences for education and training.

13. Describe your experience with and preferences for various types of learning opportunities by selecting all that apply:

What types of education and training...have you participated in?		...are you comfortable with doing?	
Face-to-face classroom	Yes	No	Yes	No
Internet-based, instructor-facilitated	Yes	No	Yes	No
Internet-based, self-paced, no instructor	Yes	No	Yes	No
CD-ROM or DVD, self-paced, no instructor	Yes	No	Yes	No
Videoconferencing (1-way satellite or 2-way interactive video)	Yes	No	Yes	No
Telephone conferencing	Yes	No	Yes	No
Telecourse (broadcast television)	Yes	No	Yes	No
Independent study of references	Yes	No	Yes	No

14. For each item, select only one choice by circling the response that indicates how often you have had that planning-related education and training experience in the past five years.

How many planning-related professional development/training sessions have you attended in the past 5 years that were...				
Face-to-face classroom?	None	1-3	4-5	> 5
Internet-based, instructor-facilitated?	None	1-3	4-5	> 5
Internet-based, self-paced, no instructor?	None	1-3	4-5	> 5
CD-ROM or DVD, self-paced, no instructor	None	1-3	4-5	> 5
Videoconferencing (1-way satellite or 2-way interactive video)	None	1-3	4-5	> 5
Telephone conferencing	None	1-3	4-5	> 5
Telecourse (broadcast television, etc.)	None	1-3	4-5	> 5
How often in the past 5 years have you had to use reference materials and independent research to learn what is necessary to perform your role?	Never	1-3 times	4-5 times	> 5 times

15. Indicate your level of agreement with the following statements:

(5 = Strongly Agree; 4 = Agree; 3 = Neither Agree nor Disagree; 2 = Disagree; 1 = Strongly Disagree)

I would be more likely to serve longer as a planning official if I had appropriate training	5	4	3	2	1
Planning-related education or training would help me perform my duties.	5	4	3	2	1
Being able to study from my home or office without having to travel to another location is important to me.	5	4	3	2	1
Time constraints would make it difficult for me to attend a classroom setting course.	5	4	3	2	1
I don't have time to take any courses.	5	4	3	2	1
Having opportunities to learn from my peers in person is more important to me than having the convenience of learning online.	5	4	3	2	1
I often have very limited time to learn as much as I can about an issue before figuring out what to do about it.	5	4	3	2	1
I am comfortable using computers and accessing the Internet.	5	4	3	2	1
I am comfortable using email.	5	4	3	2	1

Computer and Internet Availability

The purpose of this section is to help us determine the computer and internet availability for planning officials.

16. Describe your access to a computer and Internet access (check all that apply):

I have access at...	Computer Access	Internet Access
Home		
Work		
Planning Office		
School		
Other		
No access		

Required Training Preferences

The purpose of this section is to help us learn more about planning officials' preferences for required training.

17. Do you believe that planning officials should be required to receive training in order to serve as a planning official?

- () Yes
- () No

18. If you answered yes to Question 17, which of the following approaches do you feel would demonstrate meeting training requirements? (Check all that apply)

- a. Complete a series of related courses designed for planning officials but no examination.
- b. Complete one written examination that reflects pertinent topics for planning officials.
- c. Complete a series of related courses designed for planning officials; pass written examinations for each.

19. Should training be required (Check one)

- a. Before appointment as a planning official.
- b. After appointment, but before the person is allowed to serve as a planning official.
- c. During the first year of appointment.
- d. Whenever training is available.
- e. Never, people already know enough and don't need training to be a planning official.

20. Would you be willing to take an examination to become a credentialed planning official? (Check one)

- a. Yes, if the exam were no longer than two hours.
- b. Yes, if the exam were no longer than one and a half hours.
- c. Yes, if the exam were no longer than one hour.
- d. Yes, if the exam were no longer than 30 minutes.
- e. No, I would not.

21. Do you feel that ongoing continuing education is an appropriate requirement for continuing as a planning official?

- Yes
- No

22. Would you be willing to do ongoing continuing education as a requirement for continuing as a planning official?

- Yes
- No

23. In your opinion, how many hours of required continuing education per year is appropriate for continuing as a planning official?

- a. 1-5 hours/year
- b. 6-10 hours/year
- c. 11-15 hours/year
- d. 16-20 hours/year
- e. More than 20 hours/year

References

Allen, H.L., B. McCormick, and R.J. O'Brien. Unemployment and the Demand for Retraining: an Econometric Analysis. *The Economic Journal* 101 (March 1991); 190-201.

APA. American Planning Association. 2005. Urban and Regional Career Planning Information. <http://www.planning.org/careers/field.htm>

Baum, Paul. In Tough Times, A Company Should Preserve Training Budget. Penn State University. <http://www.ed.psu.edu/news/trainingbudgets.asp>

Carrion-Flores, D., E. Irwin. Determinants of Residential Land-Use Conversion and Sprawl at the Rural-Urban Fringe. *American Journal of Agricultural Economics* 86 (November 2004): 889-904.

Chandler, Michael. 2000. Training Programs for Citizen Planners. American Planning Association webpage article
<http://www.planning.org/thecommissioner/19952003/spring00.htm?project=Print>

Croner Consulting webpage article
<http://www.personnelzone.com/WebSite/WebWatch.nsf/ArticleListHTML/92F1F7A88E9F290380256D710047863C>

Dinar, Ariel. Extension Commercialization: How Much to Charge for Extension Services. *American Journal of Agricultural Economics* 71 (February 1996): 1-12.

Dinar, Ariel. Provision of and Request for Agricultural Extension Services. *American Journal of Agricultural Economics* 71 (May 1989): 294-302.

Fishel, William A. 1985. *The Economics of Zoning Laws: A Property Rights Approach to American Land Use Controls*. Baltimore: John Hopkins University Press.

Frisvold, George B., Kathleen Fernicola, and Mark Langworthy. 2001. Market Returns, Infrastructure and the Supply and Demand for Extension Services. *American Journal of Agricultural Economics* 83(3): 758-763.

Geoski, P.A. 2000. Models of Technology Diffusion. *Research Policy* 29 (2000) 603-625.

Goldschmidt, Carl. What it takes to be a Planner. *Michigan Planner*. Fall 1993: 3-5.

Greene, William. 2003. *Econometric Analysis*, 5th edition, New York University.

Heidemann, Mary Ann. 1997. What's Expected of a Planning Commissioner. *Michigan Planner*.

Hite, James. 1979. *Room and Situation: The Political Economy of Land-Use Policy*. Chicago: Nelson-Hall.

Just, Richard E. and David Zilberman. 1983. Stochastic Structure, Farm Size and Technology Adoption in Developing Agriculture. *Oxford Economic Paper*, New Series, 35 (2): 307-328.

Kelly, E.D. and B. Becker. *Community Planning: An Introduction to the Comprehensive Plan*, Island Press, Washington, D.C. 2000

Klepinger, Michael. 2002. Status of Planning and Zoning in Michigan's Great Lakes Shoreline Communities. Sustainable Coastal Community Development Initiative. Michigan Sea Grant College Program. December 2002.

Kline, Jeffrey D. and Ralph J. Alig. 1999. Does Land Use Planning Slow the Conversion of Forest and Farm Lands? *Growth and Change* 30(1999): 3-22.

Mandelbaum, Seymour J, Luigi Mazza, and Robert Burchell. 1996. *Explorations in Planning Theory*. New Jersey: the Center for Urban Policy Research.

McGrain, Brian M., and Amy J. Baumer. 2004. To Plan or Not to Plan: Current Activity within Michigan's Local Governments. Institute for Public Policy and Social Research 2004 [cited 2004]. Available from <http://www.ippsr.msu.edu/Publications/PBPlanZone.pdf>.

Michigan in Brief: 2002-03: <http://www.michiganinbrief.org/>

Michigan Land Use Leadership Council, 2004. Summary of Recent Data on Land Use and Related Trends and Conditions [Webpage]. Michigan Land Use Leadership Council 2003 [cited May 11 2004]. Available from http://www.michiganlanduse/resources/councilresources/Land_Use_Trends.pdf.

Rupasingha, Anil, Thomas Ilvento, and David Freshwater. 2000. Demand for Skills Training in the Rural South. *TVA Rural Studies Program*. University of Kentucky. Staff Paper 00-02.

Shaw, Anthony B. 1985. Constraints on Agricultural Innovation Adoption. *Economic Geography*. 61 (1): 25-45.

Suvedi, Murari, Gary Taylor, and Phillip Davis. 2002. Perspectives on Land Use: A Statewide Survey of Land Use Decision Makers in Michigan. Michigan Agricultural Experiment Station 2002 [cited December 2002]. Available from <http://35.8.121.138/vi/researchreports.asp>

Wanmali, Sudhir. 1991. Determinants of Rural Service Use among Household in Gazaland District, Zimbabwe. *Economic Geography*. 67 (4): 346-360.

Weising, James. 1996. Attitudes of Government Officials in the Grand Traverse Region on Growth, Development, and "The Grand Traverse Bay Region Development Guidebook. Plan B Paper. Michigan State University.

White, M., and P. Allmendinger. 2003. Land-Use Planning and the Housing Market: A Comparative Review of the UK and the USA. *Urban Studies*. 40: 953-972.

Wooldridge, J.M. (2000). *Introductory Econometrics. A Modern Approach*. South Western.

Wozniak, Gregory D. 1987. Human Capital, Information, and the Early Adoption of New Technology. *The Journal of Human Resources* 22 (1): 101-112.

Wyckoff, Mark. "Administering County Zoning: A Basic Guide for Citizens and Local Officials," Extension Bulletin E-1739, Michigan State University Extension, 1985

Wyckoff, Mark "Relationship of the Planning Commission to the Legislative Body: or Improving the Effectiveness of Planning," MSPO Advisor, Michigan Society of Planning, 1 (1): 1985.