

Chapter 1

Executive Summary

In urban areas across the nation, those who wish to protect farmland and other open spaces from scatter development have waged battle against the forces that create urban sprawl. This study attempts to discern precisely what it is that residents living on the fringe of suburbia value about the farmland and open space they are trying to protect. It also seeks to determine how much they would be willing to spend to achieve their goals.

The study was conducted in the Chicago collar counties of Kane, Mc Henry and DeKalb — counties where large tracts of prime farmland are under intense pressure from development. The study determined that residents in those areas view the loss of open space as a threat to the quality of life they presently enjoy. Since most open space in the three counties is farmland, residents view protecting that resource as a viable and acceptable means of slowing the advance of sprawl.

Residents of these counties also appeared willing to pay a substantial amount to protect farmland from development. On average, households who responded to the survey were willing to pay \$484 per year for five years to permanently protect about 20,000 acres of farmland in their county from development. However, publicly funded purchase of development rights programs are more often financed over a 30–year period. The equivalent annual value over a 30–year time span is \$57 per year per household. Respondents' concern for the issue was so great that when asked to rank public spending priorities they ranked protecting farmland and open space on a par with spending to reduce crime and improve schools, two issues that are historically paramount in the region.

To reach these conclusions the study used both qualitative and quantitative research methods. An extensive series of focus groups explored general attitudes toward protecting farmland and open space. The focus groups also identified key non–market amenities participants associated with farmland and open space. A comprehensive mail survey of 4,000 households in the three counties collected the information necessary to estimate how much households would pay to protect farmland.

The remainder of this summary reviews study procedures and results. It first provides some background on existing research on farmland protection, reviews the study area and describes research procedures. Two separate sections present an overview of study findings. The first draws primarily from the focus groups to identify the amenities participants associated with farmland and open space. The second presents the quantitative results including estimates of how much households would pay to protect farmland. A final section reviews implications of the study.

Background

Several recent studies document the conversion of farmland to urban uses across the nation (Vesterby and Heimlich, 1991; Greene, 1997; Sorensen et al., 1997). Researchers disagree, however, about whether farmland conversion is cause for concern and whether public programs to protect farmland are justified. Some contend that the amount of farmland lost to urban expansion does not threaten future production of food and fiber (Simon, 1990). Others argue that urban expansion often threatens highly productive or unique farmland (Sorensen et al., 1997) which is replaced by bringing less productive land into production — a practice that may eventually be unsustainable (Harlin and Greene, 1993).

Several studies suggest that programs to protect farmland are not necessary because existing markets will efficiently allocate land among alternative uses (Gardner, 1977; Fischel, 1982). These researchers conclude that the only rationale for publicly funded farmland protection programs is that existing markets do not take into account the non–market amenities associated with farmland — amenities such as aesthetics that do not have well–established economic values. Despite the pivotal role non–market amenities play in the debate over farmland protection, few studies have attempted to define or quantify them. Estimates of the economic value of these amenities would aid not only in deciding whether protection is justified but also in targeting protection programs to lands that provide the most valuable of the amenities. This study addresses this gap in knowledge about public

preferences for protection of farmland and open space.

Study Area and Research Procedures

All three counties in the study area contain large tracts of prime farmland. At the time of the 1992 agricultural census, 61 percent of Kane County, 64 percent of McHenry County and 93 percent of DeKalb County was in agricultural use (USDA, 1992). Kane and McHenry counties are currently experiencing relatively rapid population growth with the subsequent conversion of agricultural land. The U.S. Census Bureau estimated that the population of Kane and McHenry counties grew by 14 percent and 28 percent respectively between 1990 and 1997 (U.S. Census Bureau, 1997). Between the agricultural census years of 1982 and 1992, 15 percent and 8 percent respectively of the existing agricultural land base in Kane and McHenry counties was converted to other uses. DeKalb County is not yet experiencing such rapid growth. Over the same time period DeKalb County experienced a population growth of 8 percent and the conversion of 5 percent of its agricultural land base.

This study used both qualitative and quantitative research methods. The qualitative phase consisted of a series of eight focus group discussions with residents of Kane, McHenry and DeKalb counties (see Appendix A). The focus groups were conducted as informal discussions with seven to 15 adult participants led by an experienced moderator. The discussions addressed participants' perceptions of farmland and open space, their experiences with open space, the impacts of open space and development on their lifestyles and activities, and the perceived importance of maintaining nearby farmland and open space. The focus groups identified definitions of open space, the types of amenities associated with farmland and open space and unique characteristics of farmland that distinguished it from other types of open space.

The quantitative phase of the research involved a mail survey of 4,000 randomly selected households in Kane, McHenry and DeKalb counties. The survey achieved a response rate of 45 percent. The questionnaire used in the survey drew on the qualitative findings to ensure that questionnaire language was familiar, that questions were clear and meaningful and that the questionnaire addressed issues of importance to respondents. Because the survey was administered to a large, random sample of households, the quantitative results statistically represented the population of the study area. Survey results thus provided quantitative support for some of the general impressions from the qualitative work. A key quantitative result was the amount households would be willing to pay to protect a given amount of farmland in the county in which they lived.

Impacts of Farmland and Open Space

The most important aspect of open space to focus group participants appeared to be its role in slowing growth and reducing sprawl development. They viewed protection of open space as a way to block sprawl and keep at bay the negative impacts associated with such development. They seemed most concerned with the impacts of sprawl on their quality of life. Quality of life issues included their experiences with increased congestion, a more hectic pace of life, increased crime and a lost sense of community that they attributed to sprawl. Focus group participants also equated sprawl with a loss of scenic beauty, increased air and water pollution and loss of wildlife habitat.

Focus group participants associated the term "open space" with a variety of land uses. These included private farmland as well as forest preserves, parks, conservation district lands, wildlife and natural areas, wetlands, lakes, bicycling and hiking trails, golf courses and planned open areas set aside as part of a developed land use. The discussions suggested that open spaces figured prominently in participants' daily activities and contributed substantially to their quality of life. Many participants spoke of actively using nearby open spaces for recreational activities.

The survey confirmed the importance of recreational use of open space. Over 90 percent of respondents reported visiting at least one type of open space during the six months prior to the survey. Most respondents reported visits to public open spaces such as park district parks, forest preserves, hiking and bicycling trails, state parks and nature preserves. Surprisingly, more than 30 percent also reported recent visits to private farmland.

To many focus group participants, protecting farmland was synonymous with protecting other kinds of open space. Protecting either one was consistent with maintaining their quality of life. Farmland, however, did have some unique characteristics that set it apart from other kinds of open space. To some participants, particularly farmers and those with farm backgrounds, farmland represented a productive resource and a way of life. Many participants also referred to the high quality of farmland in the region and spoke of a duty of stewardship to conserve a valuable, non-replaceable resource for the benefit of future generations.

Focus group participants also spoke of negative impacts associated with farms and farming practices. These included objectionable odors from hog farms, dust and noise from field work, potential groundwater pollution and health concerns related to the use of agricultural chemicals and manure disposal, and the negative impact of local farming practices on wildlife habitat. In general, however, few participants voiced these concerns unless directly prompted for negative impacts. This suggests that these impacts were relatively unimportant in participants' overall view of the impacts of farming and farmland on their lives and activities.

<i>Perceived Impacts of Sprawl</i>
<ul style="list-style-type: none"> ◆ Increased congestion (traffic, people, buildings) ◆ Increased crime/unsafe for families ◆ Lost sense of community ◆ Loss of natural scenic beauty ◆ Increased air and water pollution ◆ Loss of wildlife habitat

Other types of open space also provided amenities not associated with farmland. Farmland, for instance, is private and not generally accessible for public use. Few participants voiced concerns about public access, however. Many seemed to believe there was adequate publicly accessible open space in the area for the time being.

Survey results supported impressions from the focus groups. Respondents chose "slowing down and controlling development" as the single most important reason for protecting open space. They also chose it as the third most important reason for protecting farmland, just after ensuring the future supply of food and protecting family farms. Other important reasons for protecting open space included protecting wildlife habitat, protecting the rural quality of the county, protecting scenic beauty and controlling flooding. They also listed each of these reasons, except protecting wildlife habitat, as important reasons for protecting farmland.

What is Protecting Farmland Worth?

The mail survey focused on characterizing public support for farmland protection and quantifying the amount households would pay to actually protect farmland. The results indicate that the average household is willing to pay \$57 per year for 30 years to protect farmland from development. At a discount rate of 2 percent, the present value of these annual tax payments would be \$2,327.

<i>Public Funding Priorities</i>
<p><i>High priority</i></p> <ul style="list-style-type: none"> ◆ protecting open space from development ◆ improving schools and the quality of education ◆ improving law enforcement and reducing crime
<p><i>Medium priority</i></p> <ul style="list-style-type: none"> ◆ improving and maintaining roads
<p><i>Lower priority</i></p> <ul style="list-style-type: none"> ◆ improving publicly funded libraries ◆ providing more public recreational facilities

Respondents viewed protecting open space from development as an important public spending priority. When asked what level of public spending they would support for a variety of public programs, they ranked spending to protect open space from development on a par with additional

spending to reduce crime and improve education. They expressed a somewhat lower preference for spending to improve roads and placed an even lower priority on additional spending on public libraries and public recreational facilities.

The study used the contingent valuation method to estimate how much study area residents would be willing to pay to permanently protect farmland in the county in which they lived. Contingent valuation is a well established approach for estimating the value of goods and services — in this case the non–market amenities of farmland — that do not have well established market prices (Mitchell and Carson, 1989). To ensure valid results, this study adhered closely to guidelines for contingent valuation research set forth by a panel of experts (Arrow et al., 1993).

The contingent valuation component of the questionnaire asked respondents whether they would vote for or against a referendum to impose a special tax on all households in the county for the purpose of protecting farmland. The questionnaire specified the amount of farmland that would be protected and the total cost to the household. The amount the average household would be willing to pay was estimated from the yes/no responses to the proposed referendum.

The referendum proposed to protect farmland by using the generated tax revenue to purchase the development rights to farmland. A number of counties and townships throughout the country have used purchase of development rights programs to protect farmland and open space. A PDR program works by separating the development rights to land from other use rights, such as mineral rights can be legally separated from other rights. Under a PDR program, farmers could volunteer to sell the development rights to their land to the county. The amount the county would pay for the rights would be equal to the difference between the value of the land for development purposes and its value as agricultural land. After selling the development rights, the farmer would still own the land. They would be able to live on and farm the land. The only restriction on land use would be against development. Future owners of the land would also be restricted from development activities.

How Much is Protecting Farmland Worth?

The average household in Kane, McHenry and DeKalb counties was willing to pay an additional \$484 in taxes each year for five years to permanently protect 20,300 acres of farmland in the county from development. However, publicly funded PDR programs are more often financed over a 30–year period. The equivalent annual value over a 30–year time span is \$57 per year per household.

One measure of support for the proposed PDR program was the percentage of respondents who would vote for the referendum. Different versions of the questionnaire offered the PDR program at 10 different costs ranging from \$5 per year for five years to \$2,000 per year for five years. As expected, the percentage of respondents who voted for the referendum fell as the program cost increased. At a cost of \$5, a total of 76 percent of respondents said they would vote for the referendum. At a cost of \$2,000, only 14 percent said they would vote for the referendum. At a cost of \$100, a majority of respondents still reported that they would vote for the referendum. The average amount of farmland proposed to be protected by the referendum was 20,300 acres.

Implications

The study found substantial support for protecting farmland in the study area. This support existed in spite of widespread objections to increased taxes among focus group participants and survey respondents. While the study did not address other methods of protecting farmland, the results suggest that many area respondents viewed a PDR program, funded by county taxes, as an acceptable tool for farmland protection.

The strong support for farmland protection seems derived primarily from a desire to protect quality of life. The qualitative and quantitative results suggested that farmland and other types of open space contributed about equally to quality of life. Respondents believed that protecting farmland helps ensure adequate food production in the future and protects family farms. They believed that other

types of open space provide better wildlife habitat than farmland and are more suited to public access. Overall, respondents seemed content with the current mix of farmland and other types of open space in the study area. The question of whether public monies are best spent to protect farmland or other types of open space will depend on the relative value of the unique amenities associated with each. Additional research will be needed to address this issue.

Relative preferences for protecting farmland versus other types of open space are likely to exhibit substantial regional variation. The preferences of Rhode Island residents, for instance, appear quite different from those of residents of the study area (Kline and Wichelns, 1996b). These differences suggest that results from one region cannot be easily transferred to other regions. Regional differences in preferences also imply that open space protection programs will need to be tailored to meet specific regional preferences.

Outline of the Report

The remainder of this report provides details of the research procedures and results. Chapter two summarizes the focus group phase of the research. The chapter presents evidence of the feasibility of a contingent valuation of non-farm benefits of farmland in the study area. It also identifies language and concepts used in questionnaire design. Chapter three reviews the questionnaire design process and survey administration procedures. Chapter four describes the data collected from the mail survey, the statistical procedures used in analysis and presents quantitative results. Chapter five summarizes the implications of the research.

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Chapter 2

Impacts of Farmland and Open Space

This chapter reviews findings from eight focus groups conducted during the initial phase of the research. Focus groups contributed to the research process and conclusions in three key ways. First, they developed qualitative information about participants' views of farmland and open space. The focus group discussions elicited participants' general attitudes and perceptions regarding farmland and open space. They also explored specific experiences with farmland and open space and its impact on participants' lifestyles and activities. Most importantly perhaps, the discussions revealed the amenities participants associated with farmland and open space. The broad picture that emerged of the role of farmland in participants' lives provided invaluable background for the remainder of the research.

Second, the focus groups contributed to the design of the contingent valuation questionnaire administered in the quantitative phase of the research. To elicit meaningful responses, a questionnaire must present information and questions in a clear and unambiguous manner and address issues that are important and relevant to respondents (Mitchell and Carson, 1989). The focus groups identified issues of importance to participants, concepts relevant to their perceptions of the issues and the language they used when discussing the issues. The focus groups thus contributed substantially to the clarity and relevance of the questionnaire.

Finally, the focus groups provided insights — in the words of those affected — into the rationale underlying the monetary values reported by respondents to the questionnaire. Qualitative evidence from the focus groups supported the notion that questionnaire responses reflected reasoned, economic choices. Comments by focus group participants provided compelling human experiences to support the sterile numbers derived from the quantitative work.

Focus Group Procedures

Focus groups are informal discussions among groups of individuals. A moderator is often in charge of guiding participants in an exploration of a predefined topic. Focus groups are well suited to identifying commonly held opinions and attitudes, familiar language and thought processes. Because focus group participants are not usually randomly selected and because responses may be influenced by group dynamics, focus group findings do not necessarily accurately reflect the opinions of the overall population. They can, however, provide an informative starting point for a representative survey of a population.

Participants for eight focus groups were recruited from eight separate communities in Kane, McHenry and DeKalb counties. Two of the groups were recruited informally through personal contacts with church congregations. The Public Opinion Laboratory at Northern Illinois University recruited participants for the remaining six groups by telephone from randomly selected lists of study area residents. Recruiters screened potential participants to obtain a group that roughly represented the communities in terms of age, gender and income. The groups contained between seven and 15 participants. They met in churches or local park district or hotel conference rooms rented for that purpose. Audio and video tape recordings of each group provided a complete and permanent record of the discussions.

Experienced moderators from the Center for Governmental Studies at Northern Illinois University led the discussions using a detailed discussion guide. The discussion guide incorporated ethnographic techniques that focused on experiences, naming and classification to elicit the perceptions and common knowledge that guide individual behavior (Johnston et al, 1995; Spradley, 1979). Appendix B of this report contains additional details on the focus groups as well as discussion guides and complete transcripts.

Perceptions of Farmland and Open Space

The moderator started the focus groups by asking participants to name different types of open space. The naming exercise, and the ensuing discussion, introduced participants to the concept of open

space, revealed participants' definitions of open space, identified characteristics of different types of open space that were relevant to participants' definitions and explored participants' perceptions of farmland within the context of open space in general.

Participants identified a variety of public and private lands as open space. They named a larger number of public open spaces than private, perhaps because public open spaces were more accessible and figured more prominently in participants' daily lives and activities. The public lands participants identified as open space included forest preserves, park district parks, state parks, city parks, conservation district lands, wildlife refuges, protected prairie areas, wetlands, lakes, historical parks, natural areas, and public bicycling and hiking trails.

Participants also identified many privately held lands as open space. These included: farmland; golf courses; open areas planned as part of residential, commercial, or industrial developments; vacant lots; and cemeteries. Among private open spaces, participants generally mentioned farmland among the first open spaces that came to mind. They mentioned most other private open spaces only after the moderator prompted them for additional open space types. The prominent mention of farmland was not surprising given that agriculture is the dominant land use in the study area. Furthermore, participants knew that the discussion addressed farmland protection.

Participants did not perceive all open spaces as equal. For some, the use of open space and the level of development were important characteristics that differentiated one type of open space from another. The following comments suggest that some participants viewed farmland and other "undeveloped" natural areas as fundamentally different types of open space than "developed" open spaces such as parks.

"I think it's [planned open space as part of a residential development] a different definition of open space than what we're talking about. It's developed open space, it's not farm and it's not natural." *Participant from St. Charles*

"Open space where there's nothing happening on it is one thing. Open space like Cantigny [a historical park in Wheaton, Illinois] or an arboretum or something, that's something else. I mean a farm has the guy going into town once a day or his wife going in once a week or whenever and they don't have 500 people visiting them every day. So that's a different kind of thing from a Cantigny or an arboretum." *Participant from Naperville*

The following comment suggests that the level of congestion was also an important characteristic of open space.

"... you can have a park but if it's surrounded by 50 homes you've got 50 other people at the park, you still don't have the space. You go to a park here [in Harvard], it's open space. You can go to the conservation district, you can go out on one of these guy's farms. They'll let you go out and look at the cattle or look at the corn, they don't have a problem with it. That's open space." *Participant from Harvard*

The focus groups revealed that participants viewed a wide range of local land uses as open space. They also confirmed that participants considered private farmland to be a type of open space.

Farmland and Open Space Amenities

A chief objective of the focus groups was to identify the amenities participants associated with farmland and open space. Amenities are the desirable goods and services people obtain from different land uses. Different types of open space are likely to provide different sets of amenities. The bundle of amenities provided by a particular type of open space is the basis for its economic value relative to other open space types. The remainder of this section reviews the amenities focus group participants associated with farmland and other types of open space. It organizes amenities in five broad categories: recreational, aesthetic, quality of life, environmental and agrarian.

Recreational Amenities

Participants reported frequent recreational and leisure use of a wide variety of open spaces. The widespread use of open space suggests it has a substantial impact on individuals' lifestyles and well-being. When asked about their use of open space, almost all participants could recall a recent visit. The few who had not visited open spaces often cited age or physical condition as reasons. Reported open space activities included walking, bicycling, picnicking, organized sports, fishing, camping, boating, swimming, birdwatching, social gatherings, family recreation and golfing. A few participants spoke of hunting on private farmland or purchasing produce or hay from farms.

Much of the use of open space seemed to center around children and recreational activities. For example, several participants with children expressed sentiments like, "kids need a place to explore. ... We just need a place to go to" or "little kids need lots of stuff, lots of different places." Site characteristics seemed to be important determinants of how participants chose open spaces to visit. For instance, participants who used open spaces for sporting activities such as baseball and soccer required the infrastructure found in developed parks. Participants who used open spaces to walk or ride bicycles visited open spaces which offered public access and trails.

For some participants, open space represented a place to enjoy leisure time in a natural setting. These participants mentioned peace and quiet as valued open space characteristics. One participant expressed these values in the following terms.

"... one of the reasons I appreciate open space is, sometimes it's just a place to get away, not to do anything in particular, just to be by yourself, to get away for awhile, sit quiet, take a walk." *Participant from St. Charles*

Direct use of open space requires public access -- an attribute not generally associated with private farmland. The following comments suggest that some participants felt constrained by the lack of publicly accessible open space in the study area.

"But typically for fishing and hunting we always go into Wisconsin because there's not the kind of expanse [in the local area] we need for the dogs that I know of."
Participant from Elgin

"That's something we haven't experienced in Illinois for a long time is to be able to walk anywhere and not be on somebody's piece of property. You go to Michigan and ... you can meander around the state and not have to worry about it. But here in Illinois we've bought everything up and broke it down. It's hard not to be on somebody's property." *Participant from Crystal Lake*

Most participants did not seem to share these opinions, however. Few mentioned limited access to private farmland as a constraint on their activities. Many expressed the opinion that there was adequate publicly accessible open space in the local area for the time being. Several participants recognized that more open spaces may be required in the future to provide adequate access to a larger population.

Aesthetic Amenities

Many participants seemed to value the aesthetic attributes of farmland and other open space. One gentleman who lived adjacent to an open field spoke of the aesthetic amenities he attached to nearby agricultural open space in the following terms.

"...my front door overlooks 150 vacant acres of land, ... land that has not been touched this year. Does it add to my visual feeling? It adds superbly. I wouldn't trade my condo location for anything because I get up in the morning and I see vacant, in theory, untouched land. It's gorgeous." *Participant from Crystal Lake*

A number of participants also spoke of driving through scenic open spaces on their way to work or just for pleasure. Some commuters expressed a preference for driving through open space rather than cities. They reported finding the drive more aesthetically pleasing and more relaxing.

"Sometimes you just go for a drive to enjoy the open space. You know, if you go for a drive in the country, just enjoy seeing the open space." *Participant from St. Charles*

"I've worked in Crystal Lake all my life. Three years ago I used to love to drive home from Crystal Lake on the back roads, ... it was wonderful. Now it's one house after another all the way up. And that's only in three and half years time." *Participant from Huntley*

Few participants expressed a preference for the aesthetic qualities of one type of open space over another. One did say, however, that he generally went to Wisconsin to experience open space because he found it more beautiful there. In general, however, participants appeared to find the local, predominantly agricultural, landscape aesthetically appealing. One summed up the pleasure he derived from living near productive agricultural land as follows.

"I think the aesthetics of having farm property around the city, as much as there are negative impacts of noise and tilling and dust and whatever. I think that they're, overall, a very positive thing. I mean, you know, when you drive out in the countryside from the city of DeKalb and it's July, high season, the corn and the beans. I mean, that is very aesthetically pleasing particularly if the sun is setting. ... that has value, that has a great deal of value." *Participant from DeKalb*

A farmer from Harvard eloquently described the aesthetics of farmland and farming in the following terms.

"Think about the changing seasons and in the spring and the ground is bare and the farmer goes in and you can actually smell dirt. And it's something most people never get to experience. And then to see those seeds come out of the ground. And you know you're doing a natural recycling process with raising these crops, feeding them to animals, taking the waste out which provides the nutrients for next year's crop. You commune with nature. You can hear the birds in the summer, you see deer, you see coyote, all different types of wildlife that are available as well as being able to see the changing of the seasons. You can hear the corn rustle in the summer. And then in the fall as you see the crops dry down. There's excitement in all that change. And I think as being a farmer that that's such a special part of our lives. I think as well for the people who grow up around farming and are able to experience that as well that that means a lot to people. Until you don't have it a lot of times you don't really appreciate it." *Farmer from Harvard*

Quality of Life Amenities

Many amenities of farmland and open space did not relate to direct use but to quality of life issues. Judging by the amount of time participants spent discussing these impacts, they were at least as important as values associated with the use of open space. Questions to assess quality of life impacts of open space and farmland asked how development of open space had affected participants' lives and activities and their reasons for wanting to protect farmland and open space. Responses suggested that participants equated development of farmland and open space primarily with the negative impacts of increasing population and sprawl development. Conversely, they associated protection with maintaining their current lifestyle and preventing the consequences of sprawl. Thus, for many participants, the value of protecting farmland and open space seemed derived primarily from the value of slowing and controlling growth. One participant described the impact of open space on quality of life in the following terms.

"If we think that this is a better lifestyle than somebody in some other part of the country. What we rate as part of that better lifestyle is the open space, is the quiet, is the ability to look at wildlife instead of taking people to cities, to a zoo." *Participant from St. Charles*

Negative impacts associated with population growth included increased traffic congestion and travel time, increased crime, increased property taxes, ugly strip developments, reduced access to open space for hunting, lost sense of community and environmental pollution.

Many participants spoke of the impact of growth and development on the congestion they experienced and the time it took them to accomplish errands. The following comments are representative of participants' experiences.

"... I think that it [development of farmland] affects us all as we think about it or look at it simply because, as you see the farmland leaving, it's being filled with people that are traveling the roads which in turn makes the traffic so much more congested just in a couple years." *Participant from Naperville*

"It used to be real quiet. But now you've got vehicles all night long, all day long and four o'clock in the morning you can't get on the highway, it's like the tollway."
Participant from Harvard

Participants also expressed concern that rapid growth was changing the character of their communities. Some said they had noticed a decline in community involvement, that they knew fewer people in the community and that they missed the sense of trust they had experienced in the past. A participant from Harvard, a community that has experienced recent, rapid growth, expressed his concerns as follows.

"I can't use the word community, it's just a place to live. Community is when you knew everybody and you said hello to them. ... So, it's, I work out of town and I come here to sleep. That's about what it amounts to." *Participant from Harvard*

Many participants also spoke of the rising crime problem that accompanied increased population. Some mentioned a growing gang problem. Many, however, associated crime with a sense of community and trust. Participants from several focus groups, for instance, recalled a time when they could leave homes unlocked and keys in their cars — something they now viewed as unsafe.

Participants also recognized that low density growth increased the cost of providing public services and led to increased taxes and lower quality of services. Several recalled what happened in their communities as population increased rapidly. The following comments summarize common themes.

"... they didn't build schools fast enough for all the developments that came in. And suddenly there were needs for more schools, there were many more children than they could fit in the schools. The quality of education dropped because they were trying to cram too many kids into the schools. Taxes rose in a big hurry." *Participant from Elgin*

"As soon as you have growth you have increased needs in the police department, the fire departments, the library district, the schools, all those things." *Participant from Huntley*

"... they move out to the country and then they want the same protections that they had. They want the same rights, they want the sewers, they want the police protection, fire protection ..." *Participant from DeKalb*

Quality of life issues extended beyond congestion and crime and encompassed the entire living experience. One woman summed up the importance of open space in her life as follows.

"... we have a little pond behind [the house] and we have oak trees and I can't tell you how much that adds to our life. It just does. The kids skate on it in the winter, they swim in the summer, there's a little beach, there's a basketball court, we have picnics out there, we watch the squirrels. It's not that big a land but I look out my window and I enjoy it every day. More than that Jacuzzi in my bathroom." *Participant from St. Charles*

Environmental Amenities

In addition to quality of life issues, many participants linked growth and development to environmental problems. For instance, participants spoke of increased air pollution, water pollution

and loss of wildlife habitat as population increased. Others expressed concern about groundwater pollution resulting from fertilizers applied to the growing number of rural lawns. Many participants also linked the development of open space and farmland to increased surface water runoff and subsequent flooding. Recent heavy rainfalls in the region had caused substantial flooding that many seemed to attribute to development. One participant expressed the common concern with flooding problems as follows.

"It [farmland and open space] percolates the water into the ground. That's one of the problems we have right now, they're making a parking lot and a shopping center out of everything whether it's needed or not. And consequently you have your incidence of flood going up." *Participant from Crystal Lake*

Environmental amenities also included the opportunity to experience nature and natural environments. Some participants spoke of the value of using open spaces for school field trips to learn about nature. One participant summed up the importance of these activities in the following terms.

"The more nature you have access to, the more you respect it. Kids that grew up in an area where they don't have much chance to observe animals in a natural habitat, they don't understand or respect it." *Participant from Elgin*

Others spoke of personal experiences with nature and natural areas.

"But the main reason I enjoy any kind of open space is that I work in Oak Grove and I'm downtown enough that I can really just appreciate the fact that you can go out somewhere and see open space and not be totally closed in. It's more of a feeling thing versus an activity thing." *Participant from St. Charles*

"I don't necessarily believe much in religions. But if you can sit out there and watch the trees and listen to the breeze blowing through the grass. If you're going to find God, he's there." *Participant from Elgin*

Natural open spaces were not the only types of open spaces that provided environmental amenities. Some participants spoke of the environmental amenities they associated with "developed" open spaces such as those planned in conjunction with residential and industrial development. The following comments suggest that, to some people, these types of open space provided the wildlife, recreational and aesthetic amenities often associated with less developed open spaces.

"Where I work there's a, some would call it a retention pond, but it's fairly protected and there's herons, egrets, kingfishers, ducks that. I do a lot of bird watching there." *Participant from Elgin*

"I work in the foundry and we own 80 acres and we have ponds and we have fishing and we have waterfalls and a parkland setting and nobody knows it's a foundry." *Participant from Huntley*

Agrarian Amenities

Participants viewed farmland as one type of open space. While farmland seemed a close substitute for other open spaces in some respects (*e.g.*, aesthetics, curbing growth and development), it was not a good substitute in other respects (*e.g.*, providing public access to open space). To identify the unique amenities participants associated with farmland, the focus group discussions provided several opportunities for participants to talk about their views of and experiences with farmland. These opportunities arose in the context of questions relating to the importance of open spaces in general and farmland specifically, ways that farmland affected lifestyles and activities, reasons for protecting farmland and impacts of farming activities. Responses revealed the amenities participants associated with farmland and the dis-amenities they associated with some farming practices. The stated reasons for protecting farmland included providing access to local food, protection of the family farm and farm heritage, aesthetics, ensuring an adequate supply of food for the future, conservation of prime farmland, flood attenuation, and stewardship and conservation for future generations.

A number of participants voiced concern that continued development of farmland would eventually threaten the ability to grow sufficient food for a growing population. Many coupled that concern with comments about the prime quality of farmland in the area. The following comments illustrate the nature of these concerns.

"But this is good tillable soil and it's the garden spot of the nation. So I'm really concerned. I know we won't see it in our generation but generations to come, are we going to have to be importing our food." *Participant from DeKalb*

"If we reduced the number of acres of tillable agriculture in DeKalb County by 20 percent, would it affect the amount of food that we produce? Absolutely. Not in our lifetime, but when are we going to start looking to the future. It will impact us sooner than we could ever get that farmland back again." *Participant from DeKalb*

"It's so sad to see such excellent farmland covered with asphalt. Every time a new parking lot goes in I think of that. And I think, what are we going to do for farmland. Because this is prime farmland and we're paving it over. How foolish can we be?" *Participant from Naperville*

A common theme in the protection of both farmland and other open spaces was the value of conservation and stewardship. A number of participants spoke of the desire to leave something for their children and grandchildren. The following representative comments illustrate participants' attitudes toward conservation.

"Well we only own it [farmland and open space] for a short time and then we're giving it to our children. I think we have to be able to give them something. If we destroy it it's not replaceable." *Participant from Harvard*

"... there's a conflict about an owner's attitude towards land between personal ownership and stewardship. ... in the prospect of our horizon in time, the land will be around a lot longer than we will. And I think most people don't appreciate it, but their very existence depends on the agricultural productivity of farmland in particular. ... So I just wanted to get the attitude about stewardship where somebody looks at their land, a farm in particular, as something they have but they have a responsibility to take care of it and not just to get as many bushels per acre out of it as they can and erode the topsoil down to nothing..." *Participant from Elgin*

Several participants spoke of buying locally grown produce from farm stands. Buying from a local farm stand was convenient and the food was fresh.

"I don't do the farming myself but I like to enjoy the produce, you know, it's nice and close, I can go out to a farm stand or something like that and pick up a lot of fresh vegetables. I love that." *Participant from DeKalb*

"Well, it's good for all of us. The farm stand, just going and getting fresh vegetables along the highway is a plus, I think it's a plus." *Participant from Crystal Lake*

Participants' comments also suggested that maintaining a link to the region's farming heritage was valuable. Participants from the more rural communities of DeKalb and Shabbona were more likely to mention a direct, personal connection to farming. Participants from most focus groups, however, nostalgically recalled experiences with farms and farm activities in their past. The following comment illustrates the value of these experiences.

"My daughter saw cows and horses born on what is now Boulder Ridge. At one time Boulder Ridge was three farms... And on those farms my children saw cows and horses born." *Participant from Crystal Lake*

Some participants also cited the importance of farming to the local economy as a reason to protect farmland. They mentioned the businesses such as implement dealers, feed stores and banks that

depend on a farm economy. They also believed that farming was better than some other industries because much of the money remained in the local economy.

In addition to the benefits of farmland, some participants also noted negative impacts associated with specific farming practices. In general, few participants voiced concerns unless directly prompted for negative impacts. This suggests that these impacts were relatively unimportant in participants' overall view of the impacts of farming and farmland on their lives and activities.

The most commonly voiced complaint about farming was the unpleasant odor associated with raising animals. Several participants expressed the opinion that farmers were there first and new residents had little right to complain about odors. Participants were least tolerant of the odors emanating from large hog farms.

"I lived near [name] Creek Farms when they had cows over there. And when the winds came from a certain direction you could smell the cows. Or when they spread the manure in the fields or whatever they did with it, it would stink the whole area up." *Participant from Naperville*

"Dairy farms are fine, cattle farms are fine. Anything but a pig farm, they're just too..." *Participant from Elgin*

"You don't hang out your wash when the wind blows from the north [hog farm]." *Participant from Shabbona*

Several participants also voiced concerns about the environmental and health impacts of pesticide and fertilizer use. One woman spoke of her concerns in the following terms.

"I also have to say that I do drive it [farmland] everyday because my kids' school is surrounded by corn. Particularly during spraying in the spring it makes me a little nervous as we're driving through and you can watch it blowing across the road." *Participant from Elgin*

Others related the use of pesticides and fertilizers to groundwater quality.

"You've got that [spraying] and you've got the runoff from a lot of the fertilizer to the groundwater." *Participant from Elgin*

"So [injecting hog manure into soil] they just pollute the groundwater and the wells around here that people are using." *Participant from Shabbona*

No participants mentioned the impacts of farming on surface water quality.

A few participants — particularly those who lived adjacent to farmland — mentioned noise and dust from farming as negative impacts. One participant also spoke of the impacts of current farming practices on wildlife habitat.

"The ditches are so trimmed that you don't even get ducks anymore. They've just eliminated the wildlife because of the farmland. They farm all along the ditches until it's so clean and they've taken all the fence posts down and a lot of animals are being crowded out of the wooded areas." *Participant from Shabbona*

Several of the focus groups contained participants who were farmers. They acknowledged that farming practices caused unpleasant odors, dust and noise. Several defended their use of pesticides and fertilizers and claimed that homeowners probably used such chemicals less responsibly than most farmers. Two farmer participants stated that they were subject to much stricter regulations governing chemical use than homeowners were and thus were more likely to use chemicals responsibly. One farmer claimed that some homeowners were "paranoid" about agricultural pesticides and fertilizers.

Farmer participants also spoke of conflict that can occur as residential areas encroach on farmland. A dairy farmer from DeKalb recalled her mother's experience near St. Charles as residential development moved closer to her farm.

"There is a big conflict. Having grown up over by St. Charles, and the subdivision moving in. When we still had our cows on pasture. Those kids saw nothing wrong with cutting that fence so they could go through. ... They saw nothing wrong with letting their dogs roam free and attack sheep or geese or cows. They saw nothing wrong with their kids coming across the pasture, not on our farm but on other farms, with a bull in there. And then all of a sudden the farmer's liable ..." *Participant from DeKalb*

Conflicts between farming and residential land use did not appear to be important to most participants. When asked about the impacts of farmland on their daily lives and activities, most participants spoke of positive impacts. Negative impacts were mentioned only after probing by the moderator.

Preferences for Open Space Protection and Development

Focus group participants spoke at length about the importance of protecting farmland and open space in the county in which they lived. When asked about the manner in which they would like future development to take place, many endorsed planning to control the pace and pattern of development. They spoke of zoning, land use plans and development fees as tools for controlling growth and development. The following comment illustrates a commonly stated desire for better planning.

"The county has to have a master plan that the cities then have to follow. And on top of that, the state has to have a master plan for Illinois to follow. Because doing it on a city by city basis, it's too small of an area to make a heck of a lot of difference." *Participant from Crystal Lake*

There was less agreement on planning objectives. Many expressed a desire to limit growth but recognized that they were part of the problem. A participant from Elgin pointed out this hypocrisy with the following statement.

"... it's hypocritical for people to be adamantly opposed to development. Most of the people who are here are probably living on what once were farms." *Participant from Elgin*

A home builder from St. Charles supported development but placed the blame for growth on those who purchased homes.

"And you guys can stop all the growth by quitting doing business. The developers won't come with their latest, greatest projects if you guys say, I'm not moving, I'm staying right here. ... if you want to stay in your two bedroom house when the kids are teenagers, that's your business." *Participant from St. Charles*

The discussion of desired development patterns covered issues of redeveloping urban brownfields, providing affordable housing and planning mixed communities. The overriding development preference seemed to be finding some way to keep the externalities of the city at bay. One participant summed this view up in the following statement.

"I keep trying to get out of the suburbs and it comes and gets me." *Participant from Elgin*

One participant stated that planning not only meant protecting open space. It also meant achieving a balance of residential, commercial and industrial development that would support the community.

"From an economic standpoint and the community, as far as tax revenue, jobs, it's ... the way I look at it I guess, is it's the lesser of two evils, if it is an evil indeed. ...

housing does not pay its way as far as tax revenue for the community. It's more of a burden. You need a balance of industrial and housing. And if that balance gets out of whack, pretty soon you're in trouble. So you do need that balance." *Participant from Harvard*

Most participants seemed to support low density housing developments as the preferred pattern for future residential growth. Typical comments in support of low density development included the following.

"...there are some areas in St. Charles and some of the small towns around there where most of the construction, they leave the trees that are there. Some of them, they even prepare large acreage for people who have horses in that area. Somewhere the people there are insisting, and they're voting on whether a developer can come in and build based on how much acreage they need between homes. And that's a better situation than what we're seeing in this area." *Participant from Elgin*

"... there's one built on top of the other. There isn't even enough room hardly in the backyard for their children to put swings up and have a backyard party. I would like to see lots that are big enough so that you can enjoy what families enjoy, you know, outside barbeques ... I'd like to see lot sizes just a little bit bigger so that you can have a few more family activities around your home rather than chasing always to the park." *Participant from Huntley*

Although many participants preferred low density development and supported land use planning to achieve it, they also expressed little confidence that planning would work to control growth and protect open space. The following comments demonstrate a sense of anger at local officials who "cave in" to development interests and money and frustration at the inability to address the problem.

"...there's always going to be somebody that has more money than the community and is going to be able to bend or grease the pockets of some politician to take that away from the community." *Participant from St. Charles*

" People are not developing there [where the development plan stipulates], they're developing on prime farmland. And the county is not doing anything about it, they're allowing it to happen by passing it by the plan because of the money waved in front of their faces." *Participant from DeKalb*

"...a number of years ago I served on a city council, ... And I saw this so often, that developers come in and they start playing a game. If you don't want it, we'll go to this town. If you don't give us what we want we'll go here. And they play this game and the politicians fall for that and buckle under and they'll give away anything." *Participant from St. Charles*

"And I think money talks in this town, that it's always outsiders bringing it in and the money talks. It's never somebody locally putting in something, most of the time. It's always outsiders and they get carte blanche." *Participant from Harvard*

Some participants, however, were less pessimistic and advocated more involvement in community issues as a way to achieve land use planning objectives. A participant from DeKalb expressed the following sentiment.

"It's disturbing to think that nobody believes that the government can do anything because I think that, maybe I'm out of step but I think that that would be the most likely source of at least the initial steps toward creating some balance rather than having the market drive this over the top of everybody. Because it will, it just will." *Participant from DeKalb*

The preference for low density development seems inconsistent with the expressed desire to protect farmland and open space. Low density "sprawl" development is the largest single contributor to the

loss of open space in the study area (Greene, 1997). The apparent contradiction between open space protection and development preferences makes more sense in light of the above discussion, however.

Many participants seemed to share the view that growth was inevitable. Furthermore, they felt they had little power over land use decisions and the subsequent pattern of development. For most participants, maintaining their quality of life seemed the primary objective of controlling development. If people feel that growth is inevitable and that they have little control over it, then advocating low density residential development may be the lesser of two evils. As two participants stated, it is safer, in terms of maintaining control over their surroundings and quality of life, to live next to land that is already developed than to live next to farmland over which they feel they have little control.

"When we built our home, our rule of thumb, because we had a house with a location problem in Elburn and it took two and a half years to sell. And our rule of thumb was, do not build next to an open space because you never know what can happen five or 10 years down the road." *Participant from St. Charles*

"[the only concern I have about living next to farmland is] that it's going to be sold and suddenly there will be a Kmart in my backyard, or a development with all houses that look the same, no trees." *Participant from Elgin*

Though low density development does not protect farmland, it does maintain a quality of life and preserves the feel of open space. In addition, planned open spaces integrated into residential or industrial developments provided some important open space amenities for some participants.

Acceptability of a Purchase of Development Rights Program

Few participants were familiar with PDR programs. When the moderator explained the program, however, they gave it serious consideration. Many suggested they would support such a program. The few who objected to the program on principle usually cited a belief that the government should not be involved in private markets. One participant, for example, reacted to the proposed PDR program with the following comment.

"Not the government, no, no, no. You've got to get things out of the government's hands. Personally I think that's what's caused a lot of this. The government hits you with the estate tax, you've got to sell to pay the taxes in order to have any money to live on. If you sell it [development rights] to the government you might as well live in communism." *Participant from St. Charles*

While most participants accepted the principle of a PDR program, many objected to taxes as a method of funding the program. There was general agreement that taxes were already too high in the area. Typical comments in opposition to taxes included:

"If we weren't taxed at such a high rate, we probably would [support the program]. But we are really taxed. ... And what's really bad is a lot of these seniors who are on a given income are fighting to stay in their houses. The taxes have shot up so drastically that, like doubled and tripled year after year, that they are being shoved out of their own homes. Now what is more important in a case like that, a park or for them to retain their houses. We are just in a tax rate that is just too astronomical." *Participant from Huntley*

"You're talking to the wrong group because they already waste and throw money away. We don't want to give them more." *Participant from Huntley*

Several of the focus groups discussed the option of paying for the program through voluntary contributions to a private non-profit conservation organization. While this avoided the contentious issue of taxes, some participants continued to support tax funding as a more equitable way to fund open space protection. Typical expressions of support for taxes included:

"There have been other... townships in the northern part of Illinois where the township itself passed referendums to have tax increases, usually very slight ones when shared by all the individuals, as an easier way to create a sum of money in preparation for those kind of opportunities. It may be many years before there's even an opportunity, just to say, we have this money available." *Participant from Elgin*

"I'd rather see the city pass an ordinance of some kind and let everybody pay for it through their taxes. Because most of us that want this kind of thing, we're already paying. Garfield Farm, we either volunteer time or money to that, their fund raising. The only way they stay alive is fund raising and that type of thing. There's only so many people who contribute to that type of thing. ... they could then pay for those things a lot easier if everybody was giving a nickel or a dime instead of somebody having to give up \$500 every time somebody tapped them on the shoulder."
Participant from St. Charles

In addition to objections to the funding mechanism, a few participants questioned the effectiveness of the proposed PDR program. One question about program effectiveness centered on whether the program could protect enough farmland to make a difference.

"But, in the real world the developer goes to the next farmer, it's still close enough, he wants to buy that one. So we have to come up with another million and half, and then on to the next one." *Participant from DeKalb*

Other participants questioned the wisdom of permanently locking land into agricultural use. In the future, they argued, agriculture may no longer be a feasible use of the land. These participants saw a need for greater flexibility in land uses allowed under the program. One participant stated that non-agricultural uses of the land should be permitted, as long as the land remained open space.

"It's just if they're coming in and they're saying this is only going to be farm forever. Well, you know, I wouldn't care if they wanted to take the farm and turn it into an arboretum, that's okay. It doesn't have to stay farming, it just has to stay open."
Participant from Naperville

Conclusions

In the aggregate, the focus group discussions suggested that, while participants disagreed about protection objectives and methods of funding, there was a great deal of support for farmland protection in general and for PDR programs as a specific protection tool. From the perspective of contingent valuation feasibility and questionnaire design, the comments illustrated the substantial impacts farmland and other open spaces had on participants' lifestyle, activities and quality of life.

Participants also seemed to view farmland protection as an economic good — a good they would accept sacrificing money to obtain. Several participants spoke of the costs — in the form of financial contributions and time — they currently incurred to support private and public open spaces. Objections to the proposed PDR program seemed to center on taxes as a payment vehicle. Few participants, however, seemed to object to some form of payment to protect farmland.

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Chapter 3

Questionnaire Development and Survey Design

This chapter reviews the questionnaire development process and details of survey design. The process of questionnaire development involved three stages. The first stage integrated information from focus groups and a literature review to produce a draft questionnaire. The second stage involved an iterative process of testing questionnaire drafts with one-on-one interviews, revising the drafts and retesting. The third stage developed a final questionnaire from the pretesting process.

Draft Questionnaire

The draft questionnaire was designed to collect the information necessary to implement a contingent valuation of the non-farm benefits of farmland protection in the study area. Focus groups, the literature on valuing farmland benefits and the requirements of applying the CV method all contributed to the content and form of the questionnaire.

One objective of the focus groups was to explore whether participants viewed farmland protection as an economic good — a good they would accept paying money for — and to test reaction to payment mechanisms. Many focus group participants expressed concern about what they viewed as very high county tax rates. They often expressed these views in the context of decisions about public spending priorities. Discussion of public spending to protect farmland inevitably brought up discussion of other public spending objectives and trade-offs and priorities among different programs. The questionnaire thus began with questions to assess respondents' public spending priorities. The questions also served to remind respondents of the potential trade-offs involved in supporting farmland protection programs.

The focus groups also revealed specific language and concepts that contributed to the clarity and relevance of the questionnaire. For example, the focus groups asked participants to define and contrast different types of open space. Responses contributed to the treatment of farmland in the draft questionnaire as a type of open space. The discussion also identified differences between farmland and other open space that were relevant to participants. The differences helped define response categories for questions that assessed reasons for protecting farmland and open space.

Many focus group participants also spoke of the way they used different types of open space. These discussions led directly to questions in the draft questionnaire that identified relevant types of open spaces and uses of those open space types. The discussion of open space uses also suggested that many uses were recreational in nature and often involved activities with children. The draft questionnaire thus asked respondents about the presence and ages of children in the household.

The literature on farmland protection suggested a number of individual and locational factors that may affect preferences and economic values for farmland protection. These factors included gender, education, a rural background, membership in a farm organization, membership in a sportsman's organization, membership in a conservation organization, strong beliefs about open space or nature, distance to farmland, size of household, personal experience with farmland, income, age, market value of agricultural products sold in the county and change in the county population (Kline and Wichelns, 1996a; Kline and Wichelns, 1996b; Kline and Wichelns, 1994; Bowker and Didychuk, 1994; Beasley et al., 1986; Bergstrom et al., 1985; Lembeck et al., 1991; Furuseth, 1987; Foster et al., 1982; Halstead, 1984; Willis, 1994). Questions in the draft questionnaire addressed many of these issues.

Finally, the design of the questionnaire drew from a large and active literature that continues to define the conditions under which CV produces valid measures of economic value.

Valuation Scenario

The key element of the questionnaire was the "valuation scenario" that elicited the amount respondents were willing to pay to protect farmland. A valuation scenario describes a market- like

setting where respondents are asked to make a tradeoff between money and the good or service of interest (Mitchell and Carson, 1989). To elicit meaningful value responses, a scenario must provide a choice situation that approximates conditions in an actual market (Fischhoff and Furby, 1988). Respondents must clearly comprehend the characteristics of the good or service offered by the scenario. They must also understand the consequences — both material and financial— of the choice the scenario asks them to make. The scenario must provide incentives for honest (non-strategic) responses and eliminate the prospect of obtaining the offered good or service without incurring the financial cost (Arrow et al., 1993).

The draft valuation scenario used a referendum valuation format. The format provides incentives for non-strategic value responses (Hoehn and Randall, 1987) and was recommended as the format of choice by a panel of experts (Arrow et al., 1993). The referendum format presents respondents with a choice of voting for or against a proposed program that provides a specified good or service at a specified cost. It has the advantage of being similar to common market choices and thus a familiar choice setting to respondents.

The draft valuation scenario reviewed historic trends in development of farmland in the county, described a purchase of development rights program that could be applied in the county, specified the number of farmland acres that would be protected and the cost of the program. The scenario proposed to authorize the county to collect a special tax to fund the program. The tax would be collected from each household for a period of five years. The scenario then asked respondents whether they would vote for or against the PDR program at the specified cost.

One-on-One Interview Pretests

Pretest interviews provided an opportunity to carefully explore how respondents reacted to the draft questionnaire. Of particular interest were whether respondents understood and accepted the questionnaire, whether they interpreted questions as intended, whether they could answer questions meaningfully and whether response categories were adequate. During the interview, respondents were asked to "think out loud" as they filled out the questionnaire. The vocalization of thought processes revealed ambiguities in the questionnaire, misunderstandings by respondents and questions that were unanswered by the questionnaire narrative. The interview setting also allowed the researcher to probe respondents' understanding of key issues and objections to or questions about elements of the questionnaire.

Twenty-two pretest interviews were conducted on four consecutive days in May of 1998. Participants were recruited from the McHenry County Retired Teachers, the Batavia League of Women Voters, the Elgin League of Women Voters and the congregation of the Mayfield Church in Sycamore. Between five and seven separate interviews were conducted each day. The questionnaire was revised each day to address issues raised during the interviews.

The interviews prompted substantial revisions to the questionnaire. For example, one question in the draft questionnaire sought to elicit the relative importance of reasons for protecting farmland. This question (and several others) asked respondents to rate the importance of a list of items on a five or 10 point scale. Many respondents assigned the same rating to all or many of the items. The lack of variation in importance ratings defeated the purpose of the question. Subsequent interviews tested a version of the question that asked respondents to rank the items in decreasing order of importance. All respondents found this task difficult. They were, however, able to identify the extremes — the most important and least important items. The final version of the question asked respondents to indicate the three most important items on the list — a task that presented little difficulty.

The draft questionnaire also couched questions in terms of the township in which the respondent lived. Some respondents did not know in which township they lived. Others mentioned that few important decisions were made at the township level and suggested that the county was a more relevant geographic region. Revised questionnaires that referred to the county of residence drew little comment.

Interview respondents also identified inadequate response categories. For example, one question asked respondents which types of open spaces they had visited within the six months prior to the

interview. Several respondents mentioned open spaces (*e.g.*, conservation district land) that were not included among the initial response categories. Subsequent questionnaire drafts incorporated these additional response categories.

The interviews contributed most substantially to the form and content of the valuation scenario. For example, one section of the scenario described a general PDR program. Probing of respondents to assess their understanding of the description revealed widespread misconceptions and many unanswered questions about program details. Subsequent questionnaire versions incorporated a numeric example of a PDR program that substantially improved understanding of program details.

The initial valuation scenario also described the criteria for selecting farmland for purchase of development rights. Respondents in the first round of interviews made little mention of the criteria and did not seem to refer to them in their evaluation of the program. Later versions of the scenario dropped reference to selection criteria. Without explicit mention of the criteria, however, some interview respondents asked how farmland would be selected. The final valuation scenario included a description of selection criteria.

Final Questionnaire

The final questionnaire consisted of eight sections. Some of the sections contained only questions. Others contained entirely informational narrative. Each section addressed a particular topic or collected a particular type of information. Sections were carefully sequenced to guide respondents from general questions about open space to specific choices about protecting farmland. Narrative sections provided the information necessary to make informed choices. In addition, many questions were designed not only to collect information but to stimulate the reasoning process. Open-ended questions interspersed throughout the questionnaire actively engaged respondents in the process by encouraging them to note their reaction to proposed programs, questions unanswered by the questionnaire and reasons for choices. Appendix A at the end of this report contains the complete final questionnaire.

Questions in the first section addressed open space in general, a category that included farmland as a special case. They assessed the priority respondents attached to protecting farmland and open space relative to spending on other public goods and services. The questions introduced the notion of public spending to protect open space and farmland, assessed the acceptability of using public monies to protect open space and reminded respondents that public spending to protect open space may require either tradeoffs with spending on other publicly provided services or increased taxes.

The second section assessed respondents' past and current experience with farmland and open space. Questions asked whether respondents grew up or currently lived on farms or in rural areas and about their current use of different types of open spaces. The questions were meant to evoke thoughts about how open space and farmland influenced respondents' lives and activities. Questions in this section also began to distinguish farmland from other types of open space.

The third section consisted of a narrative that described farmland use and impacts of farming in the county. The impacts described were based on farming practices prevalent in the region. County specific information included a comparison of farmland acres, the percent of county land in farms and loss of farmland between 1982 and 1992, years for which detailed information existed from the census of agriculture. It also described the most common farm products and the annual value of farm products. The comparison was intended to broadly describe farming in the county and illustrate the extent of farmland conversion. Table 3.1 summarizes the information used to describe farming and farmland conversion in the county.

The narrative also informed respondents of the impacts of current farming practices in the county on (1) surface water quality, (2) groundwater quality, (3) wildlife and (4) flooding. Described impacts were based on broad environmental indices developed by the Economic Research Service of the United States Department of Agriculture (USDA, 1994; see Day (1996) for additional information and citations).

Questions in the fourth section conceptually separated farmland from other types of open space. They also explicitly introduced the idea of protecting farmland and possible reasons for protection. The questions elicited the perceived importance of protecting both farmland and other open spaces and the most important reasons for protecting both. An open ended question asked respondents to list the effects of developing more farmland and open space on their daily lives and activities. The open ended question was intended to evoke thoughts about the amenities provided by farmland and the impacts of development.

Table 3.1. Change in Farming and Farmland by County, 1982 – 1992

County	Number of farms		Farmland acres		Percent of land in farms		Farmland change (1982–1992)		Value of farm products (million \$)	
	1982	1992	1982	1992	1982	1992	Acres	Percent	1982	1992
Kane	910	700	240,000	204,000	72	61	36,000	15	90	85
McHenry	1,260	980	270,000	249,000	69	64	21,000	8	95	95
DeKalb	1,150	940	396,000	378,000	97	93	18,000	5	150	160

A narrative section following the section on the importance of protection described a PDR program as one method of protecting farmland. The narrative described the key elements of a general PDR program and provided a simple numeric example. The example contrasted a PDR program with the sale of land to a developer in terms of (1) distribution of sale proceeds, (2) ownership of land and (3) permitted uses of the land. The section following the narrative assessed the perceived effectiveness of a PDR program, protection priorities and trust in alternative owners of development rights.

The sixth section of the questionnaire contained the valuation scenario. The scenario consisted of two parts. The first part described a general PDR program to protect farmland in the county. The description told the respondent that the program would be funded by a special tax collected from each household. To address the mistrust of county government expressed in the focus groups, the scenario specified that the development rights would be held in trust by a non-profit conservation organization. The scenario also listed five criteria by which farmland would be selected for inclusion in the program. These included (1) scenic beauty, (2) highly productive for crops, (3) likely to be developed soon, (4) good wildlife habitat and (5) high potential to retain water and reduce flooding. Finally, the first part of the scenario concluded by reminding respondents of reasons to accept or reject the program. These reasons served to legitimize either choice and remind respondents of budget constraints and program impacts.

The second part of the scenario described a county-wide referendum to approve the tax increase necessary to fund the described PDR program. The description first defined the referendum setting — the referendum would pass if a majority of households in the county voted for it and would fail otherwise. The scenario then presented the details of the referendum. These included the level of protection (in acres and percent of remaining farmland) and the annual tax cost to the household. It then asked respondents whether they would vote for or against the proposed referendum. The wording of the choice question again reminded respondents of referendum and program details and clearly stated the outcome of the choice. An example of the wording of the choice question is:

Would you vote "for" or "against" the program to buy development rights to farmland in your county. If you vote "for" the program, you will pay \$25 more in taxes each year for the next five years and 7,500 acres of farmland in DeKalb County will be *permanently* protected from development. If you vote "against" the program, your taxes will remain the same and the county will not buy development rights to any farmland.

The cost of the program and the number of acres proposed to be protected were varied across the sample. There were 10 different program costs and three different acreage figures. Thirty different valuation scenarios were prepared to cover all combinations of the 10 costs and three acreage levels. Each respondent received one randomly assigned version of the scenario with a single cost/acreage pair.

Two criteria guided the choice of program costs and acreage levels used in the valuation scenario. First, the anticipated statistical analysis required variation in program cost to estimate mean willingness to pay (WTP). The choice of costs depends on study objectives. A range of costs distributed across the likely distribution of value are required to estimate the form of the distribution (Duffield and Patterson, 1991). For estimation of mean WTP, costs clustered about the likely mean will produce the most efficient estimate (Alberini, 1995). Both the mean and form of the distribution were of interest in this study. Also, using a range of costs to estimate the entire distribution protects against the inefficient estimate that would result from clustering costs around an estimate of mean WTP that turned out to be incorrect. The experimental design thus assigned costs across the range of the distribution. A greater number of questionnaires, however, were distributed with costs near the likely mean of the distribution than with costs near the tails. Table 3.2 shows the distribution of questionnaires with different program costs across the sample.

A random telephone survey of 100 residents of the study area was used to estimate the likely distribution of WTP for the PDR program. The brief questionnaire used in the telephone survey described a PDR program that would purchase development rights to 10,000 acres of farmland in the county. It then asked respondents how much they would pay to support the program. Responses defined a distribution of values. The distribution was divided into eight intervals of equal probability. The upper boundaries of these intervals defined eight costs (Duffield and Patterson, 1991). In addition, an upper (lower) cost was selected at which about 95 percent of respondents offered the program at that cost would likely reject (accept) the program.

<i>Table 3.2. Distribution of Questionnaire Versions by County</i>				
Program cost (\$)	Number of questionnaires by county			
	All Counties	Kane	McHenry	DeKalb
5	200	111	50	39
25	350	190	101	59
45	410	213	133	61
70	410	218	125	67
100	410	196	141	73
170	600	283	214	103
350	600	320	189	91
570	410	200	145	65
1000	410	216	136	58
2000	200	105	61	34

The second criterion in selecting cost and acreage figures was that they be somewhat consistent with the actual total costs of implementing the proposed program. A range of costs suitable for estimation objectives was the first priority. The choice of corresponding acreage figures balanced the desire for realistic, believable levels of protection on one hand against the need to present a range of acreage figures that respondents would view as meaningfully different and the range of costs necessary for estimation on the other.

Table 3.3 reports estimated per household costs associated with the proposed programs. The second column of the table reports county populations. The third and fourth columns report approximate land values for development and agricultural purposes respectively. The fifth column is the per acre cost of a PDR program. It is the difference between the development value of land and the agricultural value. There is a great deal of variation in land values for both development and agricultural purposes. The land value estimates are approximations based on informal interviews with real estate agents and data from the 1997 Census of Agriculture (USDA, 1997).

Program costs used in the valuation scenario match up reasonably well with estimates of actual program costs. The present value of the program costs proposed in the scenario — discounted at a rate of 7 percent over the five years in which taxes would be collected — range from \$22 to \$8,774. Estimated per household program costs — reported in the final three columns of the table — range from \$519 to \$22,997. Only two of the estimated costs exceed those used in the scenario.

The valuation scenario concluded with an open-ended question that asked respondents to state the reasons they decided to vote as they did. The debriefing question assessed the rationale for respondents' choices and whether they considered economic factors in their choice. The final section collected information about household and personal characteristics. These included family composition, income, education, age, gender, proximity to farmland and membership in conservation organizations.

Sampling and Survey Administration

The sampling strategy employed a stratified random sample of households in Kane, McHenry and DeKalb counties in northeastern Illinois. The Census Bureau's 1997 population estimates (U.S. Bureau of the Census, 1997) classified 80 percent of households in the three county study area as urban. An unstratified random sample would likely have produced too few responses from rural households for statistically significant comparisons between urban and rural households. The sample was, therefore, stratified by rural and urban households and the rural stratum oversampled relative to the urban stratum. The urban (rural) stratum consisted of census tracts in which more than half the households were classified as urban (rural). Of the 115 census tracts in the three counties, 19 fell into the rural stratum and 96 into the urban stratum. Random samples of 1,500 and 2,500 households were drawn from the rural and urban strata respectively. Table 3.4 summarizes the characteristics of the two strata and illustrates the calculation of weighting variables used in the analysis.

A market research firm selected the sample randomly from the census tracts that made up the two strata. The sampling universe consisted of names and addresses listed on records including telephone directories and lists of households with unlisted telephone numbers or no telephones. The sample contained a disproportionate number of males relative to females. The 1990 census reported the population of the three counties as evenly split between males and females (U.S. Census Bureau, 1990). The sample, however, contained 65 percent males and 35 percent females. This disparity between the sample and the population presents a problem only if males and females responded differently to the questionnaire — an empirical question addressed in the analysis.

The Total Design Method (Dillman, 1978) guided survey administration. The method addresses the many small details of questionnaire design and survey administration that can influence response rates and the quality of data. The survey began on September 15, 1998 with a mailing to each of the 4,000 households in the sample. A week later, a reminder postcard was sent to each household. Three weeks after the initial mailing, a second copy of the questionnaire was sent to households who had not yet responded or for whom the questionnaire had not been returned as undeliverable. Finally, seven weeks after the initial mailing a third copy of the questionnaire was sent to households who had not responded. Appendix A at the end of this report contains the text of the reminder postcard and the cover letters mailed to respondents.

Table 3.3. Estimated Per Household Costs* of Proposed Purchase of Development Rights Program				
County	Number of	Land value for...	PDR cost	Per household cost of

	households (1997) ^a	(\$/acre)		(\$/acre)	proposed PDR program by % of farmland acres protected ^d (\$)		
		Development ^b	Agriculture ^c		2%	8%	15%
Kane	123,326	20,000	4,000	16,000	519	2,141	3,957
McHenry	80,643	15,000	4,100	10,900	676	2,703	5,069
DeKalb	28,499	15,000	3,400	11,600	3,053	12,211	22,997

* Household costs is used because it is an easily understood term. However, property taxes are assessed on a parcel basis. There are 137,000 parcels in Kane County, 117,000 parcels in McHenry County and 33,000 parcels in DeKalb County. Since there are more parcels than households, the cost of the program per tax payer would be less than indicated in the chart.

a. Population Estimates Program, Population Division, U.S. Bureau of the Census, Estimates of the Population of Counties for July 1, 1997.

<http://powerreporting.com/files/county.txt>.

b. Values obtained from an informal survey of real estate agents.

c. 1997 Census of Agriculture – Table 1. County Summary

Highlights: 1997,

http://www.nass.usda.gov/census/census97/volume1/il-13/il2_01.pdf

d. Acreage corresponding to percentages are: Kane County (2%=4,000 acres, 8%=16,500 acres, 15%=30,500 acres), McHenry County (2%=5,000 acres, 8%=20,000 acres, 15%=37,500 acres), DeKalb County (2%=7,500 acres, 8%=30,000 acres, 15%=56,500 acres).

Strata characteristics	County subsamples			Combined sample
	Kane	McHenry	DeKalb	
Number of census tracts (1990 census)	68	26	21	115
Urban	60	22	14	96
Rural	8	4	7	19
Estimated 1997 population (# of households) ^a	123,326	80,643	28,499	232,468
Urban	108,953	71,645	20,888	201,486
Rural	14,373	8,998	7,611	30,982
Percent of total households by strata (1997 estimates)				
Urban	88.3	88.8	73.3	86.7
Rural	11.7	11.2	26.7	13.3

Sample size	2,055	1,295	650	4,000
Urban	1,320	914	266	2,500
Rural	735	381	384	1,500
Percent of stratified sample by strata				
Urban	64.2	70.6	40.9	62.5
Rural	35.8	29.4	59.1	37.5
Weights for analysis ^b				
Urban	1.375	1.259	1.791	1.387
Rural	0.326	0.379	0.452	0.355

a. United States Census Bureau 1997 population estimates (U.S. Bureau of the Census, 1997).

b. Sample weights are the proportion of urban (rural) households in the study area population divided by the proportion of urban (rural) households in the stratified sample. County level weights are the proportion of urban (rural) households in the county population divided by the proportion of urban (rural) households in the county sample.

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Saving Open Spaces: Public Support for Farmland Protection is part of the Working Paper Series of American Farmland Trust's [Center for Agriculture in the Environment](#). April 1999.

Chapter 4
Household Willingness to Pay for Farmland Protection

This chapter reviews survey results and presents estimates of household willingness to pay for protecting farmland in the study area. The analysis employed both parametric and non-parametric approaches to estimate mean WTP and the effects of explanatory variables on WTP. Explanatory variables included parameters of the proposed program, respondent characteristics and development patterns within the study area. The chapter first draws on survey results to quantitatively describe respondents' preferences for farmland protection, perceptions of farmland and open space, open space protection priorities and reaction to farmland protection programs. The second section presents estimates of average household WTP to fund the purchase of development rights to farmland in the study area.

Survey Results and Sample Characteristics

Of the 4,000 questionnaires sent to prospective respondents, 289 were returned due to invalid addresses or deceased addressees. A total of 1,681 respondents returned completed questionnaires by the cutoff date of December 12, 1998 — a response rate of 45 percent of the accessible sample. The representativeness of responses was assessed in two ways. First, socioeconomic characteristics of respondents were compared with those of the population from which they were drawn.

Table 4.1 summarizes selected characteristics of respondents. Where general population data existed, the table compares respondent characteristics with those of the population in the study area. For age and education, however, the 1990 census was the most recent source of information. Respondents averaged 49 years of age — somewhat older than the general population mean of 42. Respondents reported an average income of \$65,800 — close to that for the general population when the latter was adjusted for inflation. Average income was significantly lower in the urban than in the rural stratum. Respondents also seemed to have more years of education than the general population. Those with less than a high school education appeared to be under-represented among respondents and those with graduate degrees over-represented.

Residents of DeKalb County, on average, had lived in the county for 28 years. Residents of Kane and McHenry counties had lived in the county for an average of 24 and 20 years respectively. The average number of years respondents reported having lived in the county was inversely related to the county population growth rate. Estimated population growth in Kane, McHenry and DeKalb counties between 1990 and 1997 was 15 percent, 28 percent and 8 percent respectively. Also, residents of DeKalb County lived, on average, 0.9 miles from the nearest farmland or natural open space. In Kane and McHenry counties the average distances were 1.9 and 1.1 miles respectively.

The sample strata effectively identified urban and rural populations. Sixty-one percent of respondents in the urban stratum reported living in a suburb or city compared to 11 percent in the rural stratum. One percent of respondents in the urban stratum reported living on farms versus 13 percent in the rural stratum. Despite urbanization, the study area seemed quite dependent on agriculture. Within the urban stratum, 19 percent of respondents reported that they or someone in their immediate family worked on a farm or in a business closely related to farming. In the rural stratum, 32 percent of respondents or their immediate family members were so employed.

Table 4.1. Selected Characteristics of Respondents and Study Area Population				
Characteristics	Strata			1990 Census ^a
	Urban	Rural	Combined (weighted)	
Average age	50	51	49	42 ^b
Average income	64,400	73,700	65,800	64,100 ^c

Education (%)				
Less than high school	6	4	5	19
High school or GED	19	20	20	31
Some college, vocational, or technical school	38	38	38	22
College degree	24	24	24	21
Graduate degree	13	14	13	7
Average years in county				
Kane	25	23	24	n.a.
McHenry	20	22	20	n.a.
DeKalb	27	30	28	n.a.
Average distance to farmland or open space (miles)				
Kane	2.2	0.5	1.9	n.a.
McHenry	1.2	0.5	1.1	n.a.
DeKalb	1.2	0.4	0.9	n.a.
Place of residence (%)				
Suburb or city	61	11	53	n.a.
On a farm	1	13	3	n.a.
Involved in farming or related business (%)	19	32	21	n.a.

a. U.S. Bureau of the Census, Population Census, 1990.

<http://venus.census.gov/cdrom/lookup>

b. Average age of residents aged 19 years and above.

c. The 1990 mean of \$52,200 was adjusted to 1997 price levels using a CPI of 130.7 for 1990 and 160.5 for 1997.

<i>Table 4.2. Response Rates for Selected Sample Characteristics</i>			
Characteristic	Sample size	Number of responses	Response percent
County			
Kane	2,055	833	40.5
McHenry	1,295	555	42.8
DeKalb	650	272	41.8
Strata			
Urban	2,500	943	37.7
Rural	1,500	684	45.6
Gender			
Male	3,056	1,082	35.4
Female	944	515	54.6

A second assessment of response patterns compared selected characteristics of respondents with those of the full (respondents and non-respondents) sample. Table 4.2 compares the number of potential respondents in the full sample with the number of actual responses across county, stratum and gender. Response rates across counties were not significantly different at a level of significance of $\alpha=0.01$. Response rates across strata and gender, however, were significantly different at any conventional level of significance. Females were significantly more likely than males to respond — the response rate among females was 55 percent compared to 35 percent for males. Also, respondents in the rural stratum were more likely to return the questionnaire than their urban counterparts — 46 percent versus 38 percent.¹

Preferences for Farmland and Open Space Protection

The first section of the questionnaire addressed preferences for farmland and open space and the impact of open space on respondents' lifestyles and activities. Questioning initially addressed open space and farmland in the aggregate and then moved to questions about farmland and open space separately. The sequence of questions explored preferences for open space in general, uses of different types of open space, perceived differences and similarities between farmland and other types of open space, and finally, protection priorities and reaction to farmland protection programs.

Most respondents believed that protecting farmland and open space was important relative to other uses of public funds. Forty-three percent reported that protecting more open space and farmland in the county should be one of the top public funding priorities. Forty-seven percent believed it should be a medium funding priority — to be funded only after more important issues had been addressed. Fewer than 10 percent believed public money should not be spent to protect open space and farmland.

<i>Table 4.3. Rating of Public Spending Preferences</i>	
Spending objective	Spending preference ^a
Buying open space to protect it from development.	3.51
Improving law enforcement and reducing crime.	3.51
Improving schools and the quality of education.	3.45
Improving and maintaining roads.	3.39
Improving publicly funded libraries.	2.90
Providing more public recreational facilities.	2.85

a. The spending preference scale is the average of a five point scale where 1 = "spend a lot less," 2 = "spend somewhat less," 3 = "spend about the same," 4 = "spend somewhat more," and 5 = "spend a lot more." The average rating over all services was 3.27.

Preferences for public spending to buy open space compared favorably with the preferred level of spending for other selected public services. The questionnaire asked respondents whether they thought the county should spend: (1) a lot less, (2) somewhat less, (3) about the same, (4) somewhat more or (5) a lot more to support six specified public services. The selected services were those mentioned often by focus group participants. They included: (a) improving schools, (b) buying open space, (c) improving and maintaining roads, (d) improving public libraries, (e) providing more public recreational facilities and (f) improving law enforcement.

Table 4.3 compares the preferred level of public spending reported for the six services. The average value, across all services, was 3.27, indicating a preference for slightly increased spending in the aggregate for the six programs. The preferred level of spending on open space, crime, education and roads was above the average. Preferred spending on libraries and recreational facilities was below the average. Differences between the preferred level of spending on open space, crime and education

were not large enough to be statistically different at a level of significance of $\alpha=0.05$. Preferred spending on these services was significantly greater than for roads, however. Similarly, preferred spending on libraries and recreational facilities were statistically equal but significantly smaller than preferred spending on roads.

<i>Table 4.4. Use of Open Space</i>	
Open space type	Respondents visiting (%)
Park district parks	65
Forest preserves/conservation districts	52
Bicycling/hiking trails	37
State parks	35
Farmland	34 ^a
Nature preserves	33
Golf courses	30
State conservation areas	28
Wetlands/marshes	17

a. Excludes respondents who live on farms.

Note: Results based on 1,681 complete responses.

Use of Open Space

Open space figured prominently in many respondents' activities. The average respondent reported visiting more than three different types of open spaces within the six months prior to the survey. Table 4.4 lists the proportion of respondents who reported visiting each of nine types of open space. The most popular sites were park district parks with 65 percent of respondents reporting a recent visit, forest preserves with 52 percent, and hiking and bicycling trails with 37 percent. Surprisingly, 34 percent of respondents who did not live on farms reported visiting farmland. Just under 10 percent of respondents reported that they had not visited any of the open space types listed in the questionnaire.

Age and family characteristics appeared to be significant factors in the use of open space. Several older focus group participants mentioned being physically unable to visit open space. Also, many focus group participants spoke of visiting open spaces for activities with their children. Respondents to the questionnaire who reported not having visited any open space within the six months prior to the survey were 59–years–old on average. Only 11 percent of these respondents reported having children 14 years of age or younger living at home. On the other hand, respondents who reported having visited at least one type of open space averaged 49 years of age and 33 percent reported children under 14 living at home.

<i>Table 4.5. Ranking of Reasons for Protecting Farmland and Open Space</i>		
Reasons	Farmland ^a (% of respondents)	Open space ^b (% of respondents)
Ensure future food supply	58	5
Protect family farms	52	16
Slow and control development	51	53
Preserve rural quality	49	53
Preserve scenic beauty	24	28
Reduce flooding	21	29

Protect groundwater quality	21	21
Protect wildlife habitat	16	64
Public access to open spaces	3	17

Note: The table represents the proportion of respondents who mentioned a given reason as one of the three most important reasons for protecting farmland or open space.

- a. Results based on 1,509 complete responses.
- b. Results based on 1,549 complete responses.

Open Space and Farmland Amenities

A series of questions focused on the perceived similarities and differences between farmland and other types of open space. The first question asked respondents to rate the importance of protecting both farmland and "other open space" on a four point scale ranging from "not at all important" to "very important." The distribution of responses across the four rating categories was almost identical for farmland and other open space. For both farmland and open space, over 85 percent of respondents rated protection as at least "somewhat important." More than 50 percent rated protection of farmland and protection of other open space as "very important." Only 4 percent believe protection was "not at all important."

The reported importance of protecting farmland and protecting open space are positively correlated. The correlation is significant at the $\alpha=0.01$ level. The high degree of correlation implies that respondents viewed farmland and other open space to be close substitutes in the provision of some amenities. A second question explored the degree of substitutability by eliciting the perceived importance of nine reasons for protecting both farmland and other types of open space. The question presented respondents with a list of nine reasons for protecting farmland and open space. It then asked that they indicate the three most important reasons for protecting farmland and the three most important reasons for protecting other open space. Table 4.5 summarizes the proportion of respondents who chose each reason as one of the three most important.

Substantially more respondents chose "to make sure we have enough food in the future" and "to help protect family farms" as reasons for protecting farmland than as reasons for protecting other open space. Clearly, provision of these goods is unique to farmland. Conversely, significantly more respondents chose "protect wildlife habitat" and "provide public access to open spaces" as reasons for protecting other open space than as reasons for protecting farmland. Respondents appear to believe that other open spaces provide better wildlife habitat than does farmland. Also, because it is private, farmland does not generally provide public access.

The differences in importance ratings between farmland and other open space for the five reasons in the center of Table 4.5 were not statistically different at a significance level of $\alpha=0.01$. The similarity of importance rankings for these five reasons implies that respondents may view farmland and other open space as close substitutes in providing these amenities within the study area.

Preferences for Protection Programs

Following the questions about preferences for protection and comparisons of farmland and other open spaces, the questionnaire briefly described purchase of development rights programs. The description included a simple example to illustrate program costs and subsequent ownership of land and development rights. A series of questions following the description gauged respondents' reactions to PDR programs and protection priorities.

A small majority (52 percent) of respondents believed a PDR program would work in their county. Twenty-seven percent did not know whether the program would work. Only 20 percent believed it would not work. An open-ended question asked respondents who expressed doubt about the effectiveness of the program to explain their reasons. Thirty-seven percent of respondents who questioned the effectiveness of the program gave economic reasons for their doubt. These reasons included doubt that people would accept higher taxes to fund the program, concerns that the program would be very expensive and doubts that farmers would have an incentive to sell development rights

Other important reasons respondents gave for questioning program effectiveness included concern about property rights (15 percent), questions about program details (11 percent) and general doubts about its effectiveness (9 percent). Property rights concerns consisted of objections to government involvement in property markets and concerns about restricting private property rights.

The questionnaire also asked respondents to partially rank seven different actions county governments could take to protect open space. Table 4.6 lists the proportion of respondents who chose each action as one of the three most important. Almost half of respondents listed purchasing development rights to farmland among the three most important actions. Of greater overall importance were enlarging forest preserves (76 percent) and protecting wetlands and marshes (70 percent). Respondents placed lower priority on building more hiking/bicycling trails, building more state parks, building more park district parks and building more public golf courses than they did on purchasing development rights to farmland. The rankings were the same across the three study area counties.

A comparison of preferred actions for protecting open space with reported uses of open space suggested that many respondents valued open space amenities for reasons unrelated to direct use.

<i>Table 4.6. Preferred Actions to Protect Open Space</i>	
Action to protect open space	Response percent
Enlarge forest/prairie preserves	76
Preserve more wetlands/marshes	70
Buy development rights to farmland	49
Build more hiking/biking trails	30
Build more state parks	28
Build more park district parks	25
Build more public golf courses	9

Note: Results based on 1,521 complete responses.

For instance, only 17 percent of respondents reported visiting wetlands during the past six months. Seventy percent, however, selected "preserving wetlands and marshes" as one of the three most important protection priorities. Similarly, while 34 percent of respondents who did not live on farms reported visiting farmland, 49 percent listed farmland protection as one of the three most important protection priorities. On the other hand, the number of respondents who reported using hiking/bicycling trails, state parks, park district parks and golf courses exceeded the number who ranked those open spaces among their top three protection priorities. This may imply that respondents believed there were adequate numbers of these sites already available.

A final question prior to the valuation question asked respondents whether they trusted county government, state government, federal government, or a not-for-profit conservation organization most to own development rights to farmland. A large majority (68 percent) chose the not-for-profit conservation organization. Among alternative levels of government, respondents were most likely to trust county government (27 percent), then state government (4 percent) and finally the federal government (1 percent).

Willingness to Pay Estimates

The amount households in the study area would be willing to pay to protect farmland was estimated from the yes/no responses to the value elicitation question. Table 4.7 shows referendum responses at

each of the 10 program costs. The pattern of responses is consistent with reasoned, economic choices. Economic theory suggests that the proportion of respondents willing to pay for the program should decrease as the proposed cost of the program increases. Demonstration of this relationship is one of the "burden-of-proof" tests proposed by a panel of experts convened to evaluate the CV method (Arrow et al., 1993). The proportion of 'yes' responses in the data fell from 76 percent to 14 percent as program cost increased from \$5 to \$2,000. A chi-squared test rejected the null hypothesis that there was no relationship between program cost and the proportion of 'yes' responses at a significance level of $\alpha=0.01$.

Table 4.7. Referendum Responses by Program Cost, All Counties

Program cost (\$)	Number of respondents at cost	Response percent		
		Yes	No	Don't know
5	94	76	17	7
25	145	57	22	21
45	159	55	22	23
70	147	55	26	19
100	170	57	24	19
170	227	45	36	19
350	225	33	42	25
570	168	34	46	20
1000	161	25	50	25
2000	87	14	65	21

Note: Results based on 1,583 complete responses to the value elicitation question.

The response proportions of Table 4.7 imply substantial support for purchasing development rights to farmland in the study area. Response proportions in the table represent the raw, unweighted data. Weighted results, however, do not differ significantly from unweighted results. On average, the valuation scenario proposed a PDR program that would buy development rights to 20,272 acres of farmland (or 8.4 percent of remaining farmland) in the county. A majority of households would be willing to pay at least \$100 annually for five years to support a county level PDR program that protected 20,272 acres of farmland.

An open-ended question immediately following the value elicitation asked respondents to state reasons for their choice. Responses provided additional evidence that respondents took the valuation exercise seriously, considered the impact of the proposed program on their lives and made economic (budget constrained) valuation decisions. Seventy-eight percent of respondents gave at least one reason for their choice.

Fifty-eight percent of respondents who gave a reason for their choice referred to economic considerations. Economic reasons fell into three categories. First, 24 percent of respondents made some reference to their personal economic situation. These included statements that they could not afford the program cost or that the cost was worth the benefit. These comments suggested that respondents took the choice seriously and made budget constrained choices. Reasons illustrative of budget constrained choices included:

"As a single mother, my dollars are stretched to the limit. More taxes might mean not buying groceries." *Respondent from Kane County*

"It is a small amount to pay for such precious land. I lived in DuPage County for 25 years and I cry when I go back to the area. We are on a limited budget with kids in college but we would sacrifice." *Respondent from DeKalb County*

Many respondents (24 percent) also stated a general objection to higher taxes as the reason for their choice. In contrast to comments relating taxes to a respondent's personal economic situation, general objections made no explicit connection between taxes and program benefits. They were merely statements that taxes were too high. The final economic reason related to program economics. Ten percent of respondents suggested that there were better ways to fund protection efforts or questioned the proposed tax increase relative to perceived protection costs.

Other important reasons for the respondents' choice included reasons related to the externalities associated with growth and quality of life (22 percent), questions about program details (13 percent) and general comments about protecting farmland or open space (9 percent).

Estimates of Annual Household WTP

A probit model was used to estimate mean household WTP from responses to the valuation scenario. The usual probit model assumes that WTP is normally distributed and estimates the probability of a 'yes' response as a function of a set of explanatory variables. Coefficient estimates from the probit model represent the effect of the explanatory variables on the probability of a 'yes' response rather than effects on the variable of interest, willingness to pay. This study used a variation of the probit model that directly estimated the mean and standard deviation of the (normal) distribution of WTP (Cameron and James, 1987). Coefficients of explanatory variables represent the effect of a one unit change in those variables directly on mean WTP.

The Cameron and James technique maximizes the log likelihood function:

$$\log L = \sum_{i=1}^n \{ y_i \log[1 - \Phi((t_i - x_i \beta) / \sigma)] + (1 - y_i) \log[\Phi((t_i - x_i \beta) / \sigma)] \}$$

where the subscript i denotes individual observations, y_i equals 1 if respondent i voted for the referendum and zero otherwise, Φ is the standard normal cdf, t_i is the program cost offered to respondent i , x_i is the vector of explanatory variables for respondent i , β is the vector of estimated coefficients, and σ is the standard deviation of the estimated distribution.

Table 4.8 presents the probit regression results from the Cameron and James procedure. The first and second columns of the table list variable names and descriptions. The third through fifth columns list estimated coefficients for three alternative models. Comparisons of the three alternative specifications facilitated tests for differences in WTP between the three study area counties. Previous research suggested that county specific variables such as population growth rates and the proportion of the county in farmland may affect support for PDR programs (Kline and Wichelns, 1994; Lembeck, et al., 1991). Models two and three included county characteristics as explanatory variables model two used county indicator variables (MCHENRY, DEKALB) and model three included county population growth rates and percent of land in farms (GRTHRATE, FARM PCT).

Table 4.8. Estimated Probit Regression Coefficients				
Variable name	Variable description	Model alternatives		
		# 1	# 2	# 3
Constant	Constant term	195.76*** (72.88)	205.41*** (83.70)	194.16*** (73.24)
PERCENT	Percent of farmland acres protected	7.82 (7.18)	7.76 (7.21)	7.76 (7.21)
INCOME	Income (\$1,000)	3.17*** (0.95)	3.12*** (.96)	3.12*** (.96)

YEARS	Years lived in county	-2.69 (2.23)	-2.70 (2.24)	-2.70 (2.24)
RURAL	Rural background	78.93 (76.91)	81.66 (77.28)	81.66 (77.28)
VISIT_FARM	Visited farmland in past six months	296.70*** (90.89)	301.35*** (92.50)	301.35*** (92.50)
CONSERVE	Member of conservation organization	250.49** (105.01)	254.13** (106.40)	254.13** (106.40)
VISIT_OPEN	Visited open space in past six months	86.49*** (22.10)	86.36*** (22.17)	86.36*** (22.17)
FARMING	Involved in farming	-264.78** (115.00)	-262.92** (116.02)	-262.92** (116.02)
PRIORITY	Should not use taxes to protect farmland	-1347.90*** (223.25)	-1346.30*** (226.15)	-1346.30*** (226.15)
MCHENRY	Resident of McHenry County		-4.26 (82.28)	
DEKALB	Resident of DeKalb County		-62.16 (123.50)	
GRTHRATE	County population growth rate (%)			0.11 (5.83)
FARMPCT	Percent of county land in farms			-1.92 (4.26)
SD	Estimated standard deviation	947.84 *** (87.83)	950.66*** (89.35)	950.66*** (89.35)
Log likelihood value		-682.20	-682.07	-682.07
McFadden's R2		0.16	0.16	0.16
Percent correct predictions		69	69	69

a. Asterisks indicate significance at $\lambda = 0.05^{**}$, and 0.01^{***} .

Note: Results based on 1,171 cases with complete responses for all variables.

Table 4.9. Determinants of Annual Household WTP for Farmland Protection: Estimates from Censored Distribution		
Variable name	Variable description	Variable impacts ^a
Constant	Constant term	484.05 ***
PERCENT	Percent of farmland acres protected	4.56
INCOME	Income (\$1,000)	1.85 ***
YEARS	Years lived in county	-1.56
RURAL	Rural background	47.20
VISIT_FARM	Visited farmland in past six months	190.23 ***
CONSERVE	Member of conservation organization	158.36 **
VISIT_OPEN	Visited open space in past six months	51.85 ***

FARMING	Involved in farming	-139.42 **
PRIORITY	Should not use taxes to protect farmland	-432.55 ***

a. Asterisks indicate significance at $\lambda = 0.05^{**}$, and 0.01^{***} .

Note: Results based on 1,171 cases with complete responses for all variables.

The three models essentially fit the data equally well. McFaddens' R^2 , a measure of goodness of fit for discrete choice models, was 0.16 for all three models. Also, the predictive accuracy of the three models was the same (62 percent). Predictive accuracy is the percentage of cases for which predicted 'yes' or 'no' responses match actual responses. Likelihood ratio tests suggested that county specific variables do not contribute significantly to explaining variation in WTP.³ Thus, there was no significant difference between the counties in the amount households were willing to pay to protect farmland. The remainder of the discussion and analysis is based on the specification of model one.

Respondents did not represent the study area population in terms of age, education or gender. In alternative models not reported here these variables had no significant effect on household willingness to pay. The non-representativeness of the sample does not, therefore, appear to bias estimated results.

The regression results reported in Table 4.8 are weighted by the sample weights presented in Table 3.4. Rural households were over-sampled relative to urban households. The weighting procedure accounted for this by assigning more weight to responses from urban households than to those from rural households. Regression results thus represent the general population of the study area rather than the stratified sample.

The normal distribution, on which the probit model is based, is unbounded. It extends from negative infinity to positive infinity. Negative values of WTP, however, are inconsistent with economic theory — valid WTP values must be either zero or positive (Haab and McConnell, 1998). The final step in estimating mean WTP censored the estimated distribution at zero and calculated the mean of the censored distribution. Censoring assigns all the probability weight in the negative portion of the distribution to zero. Censoring is consistent with a belief that a portion of respondents are not willing to support the program at any price. The censored mean represents a theoretically consistent estimate of mean WTP for the proposed PDR program.

Table 4.9 reports the coefficient estimates of model one when the estimated distribution of WTP is censored at zero.⁴ All explanatory variables, except PERCENT, were included in the model of Tables 4.8 and 4.9 as differences from mean values. The coefficient of the constant term, 484.05, therefore represents annual WTP for the average household in the study area. Coefficients of the explanatory variables represent the effects of a one unit change in the variable on annual WTP. Table 4.10 reports the mean, minimum and maximum values for each variable.

The valuation scenario defined the proposed PDR program in terms of two characteristics — the tax cost of the program and the number of farmland acres protected. Program cost was a significant determinant of WTP for the program although it does not appear explicitly in the Cameron and James probit model results. The acres of farmland protected, represented by the variable PERCENT, however, was not a significant determinant of WTP. The lack of significance of the variable may indicate that respondents did not believe the proposed levels of protection (2 percent, 8 percent and 15 percent of remaining farmland) to be meaningful in terms of impacts on their lives. Some other studies of WTP for farmland protection used much greater levels of protection of one quarter, one half, three quarters and all of the remaining farmland (Bergstrom et al., 1985).

Several previous studies found that age, the number of years a respondent had lived in the county or a rural background to be significant determinants of support for farmland protection programs (Kline and Wichelns, 1996a; Beasley et al., 1986; Bergstrom et al., 1985). Neither the number of years a respondent had lived in the county (YEARS) nor a rural background (RURBACK) significantly affected WTP for farmland protection in the study area. Respondents with a rural background were defined as those who reported growing up on a farm, in a rural area or rural small town or in a rural

subdivision. The variable YEARS was closely correlated with a respondent's age. Although age was not included in the final model specification, it had no significant effect on WTP.

Use value seemed to be an important component of protection value for some respondents. The variable VISIT_FARM identified respondents who reported visiting farmland within the six months prior to the survey (excluding those who lived on farms). Respondents who visited farmland were, on average, willing to pay \$190, or almost 40 percent, more annually than those who had not visited farmland. Similarly, the level of outdoor activity respondents reported engaging in had a significant positive influence on WTP. The variable VISIT_OPEN represents the number of different types of open space respondents reported visiting within the past six months. Values for the variable ranged from zero to nine with a mean of 3.3 different sites. Each additional type of open space visited added \$52 to annual WTP to protect farmland.

<i>Table 4.10. Descriptive Statistics for Regression Variables</i>			
Variable name	Mean	Minimum	Maximum
PERCENT	8.28	2.00	15.00
INCOME	0.00	-62,972	132,028
YEARS	0.00	-22.26	63.23
RURBACK	0.00	-0.53	0.47
VISIT_FARM	0.00	-0.29	0.71
CONSERVE	0.00	-0.16	0.83
VISIT_OPEN	0.00	-3.17	4.83
FARMING	0.00	-0.14	0.86
PRIORITY	0.00	-0.09	0.91

Note: Results based on 1,171 cases with complete responses for all variables.

Membership in a conservation organization also had a statistically significant impact on WTP. The variable CONSORG identified respondents who reported being a member of at least one conservation organization. These respondents were willing to pay \$158 more annually to support the PDR program than those who reported no affiliation.

Respondents who reported that they, or an immediate family member, worked in farming or a business closely related to farming were willing to pay \$139 less each year to protect farmland. These respondents were more likely to live on farms or in rural areas than respondents who had no immediate family connection to farming. Nineteen percent lived on farms and 32 percent lived in rural areas or rural small towns. Corresponding percentages for respondents who did not have an immediate family member who worked on a farm or in a farm related business were 2 percent and 23 percent respectively.

Summary of WTP Measures

The probit model assumes a normal distribution of WTP. If the assumption of normality is not justified, estimates will be inefficient (Haab and McConnell, 1998). Non-parametric upper and lower bounds on WTP, that impose no distribution on the data, were calculated as a check on the distributional assumptions of the probit model (Coslett, 1983; Kristr'm, 1990). The response percentages reported in Table 4.7 define the empirical cumulative distribution of WTP. The non-parametric bounds are calculated from the empirical distribution in the following manner. First, the difference between the percentage of 'yes' responses to a program cost, c_1 , and the next highest cost, c_2 , represents the proportion of respondents who would pay at least c_1 but not more than c_2 . Calculating this difference for each cost yields the empirical proportion of the population (if the sample was randomly selected) who fall into each interval between program costs. It represents the

proportion who are willing to pay at least as much as the lower bound of the interval but no more than the upper bound.

A lower (upper) bound on WTP is the sum of interval probabilities multiplied by the cost at the lower (upper) bound of the interval. Since WTP must be positive, the lower bound of the lower interval is zero. The upper interval is unbounded from above since there is no information about the cost at which respondents who say 'yes' to the highest cost would say 'no.' In this case an upper bound was defined as the cost at which the probit model estimated that 99 percent of respondents would reject the project. That cost was \$2,500.

Table 4.11 summarizes estimation results for each county separately and for all counties combined. Column two gives the number of observations used in the analysis. It presents both the total number of responses and the number of complete responses used in the regression analyses. Column three lists the probit means and standard errors. Column four contains the censored estimates of annual mean WTP. Columns five and six report the lower and upper non-parametric bounds. Three of the four censored means generally lie within (or close to) the interval defined by the non-parametric bounds. For all counties combined, the censored mean lies essentially at the lower bound. For McHenry County the censored mean is below the lower bound. Thus, the censored means are likely conservative estimates of WTP.

The uncensored probit mean for DeKalb County is negative but not significantly different from zero at any standard level of confidence. The weak results for DeKalb County likely stem from the small number of responses from the county (157). The small number of responses did not provide enough observations for strong statistical results. When combined with data from the other counties, however, the total number of observations led to very strong statistical results.

The last three columns of the table show the present value of WTP over the five years that taxes would be collected. The valuation scenario described a PDR program that would last for five years. After that time the special tax would end and no further development rights would be purchased under the program. Total household WTP for protecting the stated quantity of farmland is thus the present value of a five year stream of tax payments. Present value depends on the discount rate applied to future payments.

Present value is given for three discount rates, 2 percent, 7 percent and 10 percent. Given the short time period involved, estimates are not particularly sensitive to different discount rates. An average household in the study area is willing to pay \$484 per year for five years to protect 20,272 acres of farmland (the average across all returned questionnaires). The present value of total WTP is \$2,123 at a discount rate of 7 percent. A 10 percent discount rate reduces the present value of WTP by 4.9 percent to \$2,018. A discount rate of 2 percent increases the present value of WTP by 9.6 percent to \$2,327.

Table 4.11. Summary of WTP Estimates, Non-Parametric Bounds Present Value of WTP

County ^{a, b}	Number of Observations (all/regression)	Probit mean ^c (\$/year)	Censored mean (\$/year)	Non-parametric bounds (\$/year)		Present value of censored mean (\$)		
				Lower	Upper	2 percent	7 percent	10 percent
All counties	1,660/1,171	196 (73)	484	486	748	2,327	2,123	2,018
Kane	833/665	195 (112)	505	490	794	2,428	2,216	2,106
McHenry	555/349	252 (88)	405	452	700	1,947	1,777	1,689
DeKalb	272/157	-197 (474)	673	528	702	3,236	2,953	2,806

a. County level results are weighted by county weights to represent the population of the county. Results from the combined sample are

- weighted by the sample weight to represent the entire study area.
- b. Differences between counties are not statistically significant at any conventional level of confidence.
 - c. Numbers in parentheses are standard errors.
-

¹ The three tests were based on a χ^2 test of the difference between proportions (Freund, 1962, pp. 330). ([Back to text.](#))

² Analysis of open-ended responses is based on transcribed and coded responses from a random sample of 249 (14.8 percent) of returned questionnaires. ([Back to text.](#))

³ The likelihood ratio statistic for both tests was 3.78 -- a value at which the null hypothesis that the coefficients of MCHENRY, DEKALB, GRTHRATE FARMPCCT are equal to zero cannot be rejected. The test had a level of significance of $\alpha=0.01$. ([Back to text.](#))

⁴ The mean of the censored (at a) normal variable y with mean μ and variance σ^2 is:

$$E[y|a=0] = \Phi\left(\frac{\mu}{\sigma}\right) (\mu + \sigma\lambda), \quad \text{where } \lambda = \frac{\phi(\mu/\sigma)}{\Phi(\mu/\sigma)},$$

$\Phi()$ and $\phi()$ are the cdf and pdf respectively of the standard normal distribution (Greene, 1993, pp. 693).

The censoring adjusted coefficient, β_i , of an explanatory variable, x_i , was calculated as:

$$\beta_i = \Phi\left(\frac{\mu + \beta}{\sigma}\right) (\mu + \beta + \sigma\lambda) - \Phi\left(\frac{\mu}{\sigma}\right) (\mu + \sigma\lambda), \quad \text{where } \lambda = \frac{\phi((\mu + \beta)/\sigma)}{\Phi((\mu + \beta)/\sigma)}.$$

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Chapter 5 Research Implications

This chapter reviews research findings relative to study objectives. The study had two primary objectives. The first was to identify the environmental and social benefits of farmland. The second was to determine the economic value of benefits and suggest ways to build values into fiscal impact studies. Both the qualitative and quantitative phases of the research contributed to these objectives. Focus groups identified the types of benefits participants attributed to farmland and open space. The household survey collected the information necessary to describe the relative importance of some benefit categories and quantified the economic value of farmland benefits. Qualitative evidence from the focus groups corroborated quantitative benefit estimates and provided evidence of economically meaningful responses to the questionnaire.

Environmental and Social Benefits of Farmland

This study documented substantial environmental and social benefits associated with farmland and open space. Judging by the time focus group participants spent discussing the issue, the impacts of farmland and open space on quality of life appeared to be one of the more important categories of benefits. Quality of life had both social and environmental dimensions. Social aspects of quality of life included crime and safety, congestion and traffic, a sense of community, and peace and quiet. Environmental quality of life aspects were primarily aesthetic in nature. A key conclusion relative to quality of life benefits was:

- ◇ Farmland and other open spaces seemed to contribute about equally to quality of life attributes. Respondents to the questionnaire rated quality of life factors (*i.e.*, slowing and controlling development, protecting rural quality, protecting scenic beauty) about equally as reasons for protecting either farmland or other types of open space. Thus, in terms of impacts on quality of life, people may be indifferent between protecting farmland or other types of open space.

Protecting farmland and open space also provided environmental benefits separate from those grouped under quality of life. These included providing wildlife habitat and protecting water quality. Key conclusions include:

- ◇ Wildlife habitat is an important benefit of open space. Respondents to the questionnaire identified protecting wildlife habitat as the single most important reason for protecting open space. Few viewed wildlife habitat as a benefit associated with protecting farmland.
- ◇ Results relative to water quality benefits were inconclusive. Focus group participants rarely mentioned water quality. When they did, they seemed to view farming practices as detrimental to groundwater quality. Nineteen percent of respondents to the questionnaire, however, rated protecting groundwater quality among the three most important reasons for protecting farmland.

Other social benefits associated with protecting farmland and open space included protecting family farms, access to locally grown food, protecting food production capacity and access to open space for recreational use.

- ◇ Farmland was relatively unique in providing benefits associated with protecting family farms, providing locally grown food and protecting food production capacity. Protecting the capacity to grow food in the future was the single most important reason for protecting farmland relative to other types of open space. Many focus group participants recognized the unique productive capacity of farmland in the region and the irreversible nature of farmland development.

- ◇ A large majority of study area residents appeared to actively use publicly accessible open space. Even so, few rated public access an important protection priority. Thus, residents of the study area may believe that there is currently an adequate amount of publicly accessible land.

Farmland and open space produced numerous benefits to residents of the study area. Many of these benefits, and perhaps the most important, seemed to be provided equally well by either farmland or other types of open space. For instance, residents appeared to view protection of farmland or open space as equally effective in providing quality of life benefits a seemingly important component of overall benefits.

Farmland provided some unique benefits such as protecting farms and the regions' farm heritage, providing locally grown food and protecting food production capacity. Conversely, questionnaire respondents viewed protection of wildlife habitat as an important protection priority a benefit few associated with farmland protection.

Implications for Farmland Protection Efforts

The economic value of benefits associated with farmland protection are substantial. Because few of these values are reflected in markets, however, they are rarely considered in local land use decisions. The study results have some important implications for land use planning and farmland protection efforts in the study area.

- ◇ The results demonstrate that there is a real cost associated with developing farmland and open space. At the least, the magnitude of these costs may justify long range planning efforts and local funding for farmland and open space protection.
- ◇ The study also demonstrated substantial public support for farmland protection. The level of support suggests that residents of the study area would likely approve a well conceived and publicized publicly funded farmland protection program. The support for PDR indicated by this study, however, was found in the absence of strong arguments against PDR. An effort to pass an actual PDR referendum that faces strong opposition may not have as much support.

Study results have important implications for targeting open space protection programs. One aspect of programs to protect open space or farmland is the choice of which tracts of land to protect. Open space and farmland protection programs can be used to direct development toward some locations and away from others. Among the implications of this work for targeting protection efforts are:

- ◇ The relative importance of protecting food production capacity argues for protecting prime farmland.
- ◇ Select tracts for protection and for development so as to minimize impacts on quality of life. This implies integrating development with adequate transportation infrastructure, maintaining the feel of open space and promoting livable residential developments with access to open space.
- ◇ To a large extent, the benefits associated with protecting farmland appear similar to those associated with protecting other types of open space. Provision of wildlife habitat was the only highly rated benefit of protecting open space that people did not associate with farmland. Farmland protection programs that attach a large weight to wildlife habitat criteria may provide many of the open space benefits valued by residents.

The study also has implications for future efforts to apply farmland protection such as PDR in the region.

- ◇ A significant number of focus group participants and pretest respondents did not easily grasp the details of a PDR program. A common complaint about the program was that it took private property rights away from farmers. Any

future efforts to implement a PDR type program will require significant public education for widespread approval.

Directions for Future Research

This study also suggested some directions for future research. Some were a result of perceived deficiencies in the design of the study. Others were extensions of the present work suggested by the results. Specifically, the study design failed to identify a significant response to the level of protection described in the valuation scenario. Many of the benefits of open space mentioned by respondents (i.e., reduced traffic congestion), however, seemed dependent on the amount of open space protected. A sensitivity of WTP to the number of acres protected would thus be expected. It is likely that respondents did not perceive the difference between protecting 2 percent, 8 percent or 15 percent of remaining farmland to be significant in terms of impacts on their lives. Future research that explored the amount of land respondents feel it is necessary to protect would be valuable.

Also, the results of this study strongly suggest that respondents were relatively indifferent between protecting farmland or other types of open space. A more detailed exploration of the perceived degree of substitutability between farmland and other types of open space would aid in targeting protection programs to be consistent with public preferences for preservation.

Finally, the study identified the reasons respondents believed protection of farmland and open space was important. While many of the reasons were the same as in previous studies the ranking by importance was quite different. For instance, this work found that slowing growth and development was one of the most important reasons for protecting both farmland and other types of open space. In a study in Rhode Island (Kline and Wichelns, 1996b), however, slowing growth and development was one of the least important reasons. Differences in the relative importance of reasons for protecting farmland will aid in targeting protection to particular land types. Replication of these types of studies in other regions may identify regional characteristics that contribute to different preferences for protection.

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*Appendix A
Questionnaire and Details of Survey Administration*

This appendix contains the complete final questionnaire.

The questionnaire reproduced here is a version developed for DeKalb County. Following the questionnaire are copies of the cover letters sent with each of the three waves of the survey and the text of the reminder postcard sent in the second week of the survey.

QUESTIONNAIRE

***Protecting
Farmland
& Open Space
in DeKalb County:

Is it Important to You?***

1. State and local governments collect taxes to provide a number of goods and services. In your opinion, should DeKalb County spend more or less money on each of the following things? Keep in mind that the county cannot spend more money on everything without increasing taxes.

	<i>Circle best response</i>					
Improving schools and the quality of education.	Spend a lot more	Spend somewhat more	Spend about the same	Spend somewhat less	Spend a lot less	Not sure
Buying open space to protect it from development.	Spend a lot more	Spend somewhat more	Spend about the same	Spend somewhat less	Spend a lot less	Not sure
Improving and maintaining roads.	Spend a lot more	Spend somewhat more	Spend about the same	Spend somewhat less	Spend a lot less	Not sure
Improving publicly funded libraries.	Spend a lot more	Spend somewhat more	Spend about the same	Spend somewhat less	Spend a lot less	Not sure
Providing more public recreational facilities.	Spend a lot more	Spend somewhat more	Spend about the same	Spend somewhat less	Spend a lot less	Not sure
Improving law enforcement and reducing crime.	Spend a lot more	Spend somewhat more	Spend about the same	Spend somewhat less	Spend a lot less	Not sure

2. Given all the things that your local governments could spend money on, what priority do you think should be given to preserving more open space and farmland in DeKalb County? (**Circle one number**)

- 1 **Low priority** – public money should not be spent to preserve open space and farmland in the county
- 2 **Medium priority** – spend money on it only if funds are left over after more important issues are addressed
- 3 **High priority** – preserving farmland and open space should be one of the top funding priorities

3. Which of the following best describes the area where your family lived most while you were growing up? (**Circle one number**)

- 1 On a farm
- 2 Rural or rural small town
- 3 Rural subdivision
- 4 Suburb
- 5 Urban or city

4. Which of the following best describes where you live now? (**Circle one number**)

- 1 On a farm
- 2 Rural or rural small town
- 3 Rural subdivision
- 4 Suburb
- 5 Urban or city

5. For how many years have you lived in DeKalb County? **Fill in number of years**)

_____ years

6. Which of the following kinds of open spaces in DeKalb County or in neighboring counties have you or members of your household visited in the past six months? (**Circle all that apply**)

- 1 Park district parks
- 2 State conservation areas
- 3 Forest preserves/county conservation districts
- 4 State parks
- 5 Wetlands/Marshes
- 6 Biking/Hiking trails
- 7 Golf courses
- 8 Farmland
- 9 Nature preserves

Farmland in DeKalb County

Farmland is one type of open space in DeKalb County. As the population of DeKalb County grows, however, farmland is being developed. The following numbers illustrate how the amount of farmland in the county has changed.

- ◆ In 1982, DeKalb County had 1,150 farms that covered 396,000 acres of land – 97 percent of land in the county. Farms sold about \$150 million in agricultural products.
- ◆ In 1992, DeKalb County had 940 farms that covered 378,000 acres of land – 93 percent of all the land in the county. Most of this land (86 percent) was planted in corn or soybeans. About one-third of these farms also raised cattle or hogs. DeKalb County farms sold more than \$160 million in agricultural products.
- ◆ Between 1982 and 1992, about 5 percent of the farmland (18,000 acres) in DeKalb County, was converted to other uses.

Compared to natural areas, farming and development may both affect the environment of DeKalb County. Some of these effects are summarized below.

Farming and Surface Water Quality -- Most of the rivers, streams, and lakes in DeKalb County are affected by sediment and nutrients from farming activities. Construction and development activities also pollute surface water. Water quality in DeKalb County is better than the average in Illinois and is generally improving.

Farming and Ground Water Quality -- There is very little information about the effects of farming on groundwater pollution in DeKalb County. Because of favorable soil conditions, however, farming is unlikely to cause widespread groundwater pollution in DeKalb County.

Farming and Wildlife -- In general, farmland does not make good wildlife habitat. Modern farming has probably greatly reduced the diversity and numbers of wildlife in DeKalb County compared to

what they were without farming. Natural areas probably provide better habitat than farmland while most developed land is probably worse.

Farming and Flooding — Farming activities in flood plains can increase flooding. Some farmland may also absorb water and reduce flooding. A national study concluded that farming activities may slightly increase flooding in DeKalb County.

7. *In your opinion, how important is it to you personally to protect more farmland and other types of open space from development in DeKalb County?*

	<i>Circle best response</i>				
Farmland	Not at all important	Not too,br> important	Somewhat important	Very important	Don't know/ no opinion
Other open space	Not at all important	Not too,br> important	Somewhat important	Very important	Don't know/ no opinion

8. *In your opinion, how would developing more farmland in DeKalb County affect your daily life and activities? (Write a short response)*

9. *The following are some reasons other people have given for preserving farmland and other types of open space. You may think that some of these are good reasons and some are not. Which are the three most important to you personally for preserving both farmland and other types of open space? (Circle three numbers for farmland and three for open space)*

- | <i>Farmland</i> | <i>Other open space</i> | |
|-----------------|-------------------------|---|
| 1 | 1 | Make sure we have enough food in the future |
| 2 | 2 | Slow down and control development |
| 3 | 3 | Protect wildlife habitat |
| 4 | 4 | Help preserve family farms |
| 5 | 5 | Preserve the rural quality of DeKalb County |
| 6 | 6 | Provide public access to open spaces |
| 7 | 7 | Retain water and reduce flooding |
| 8 | 8 | Preserve the scenic beauty of DeKalb County |
| 9 | 9 | To protect groundwater quality |

A Plan to Protect Farmland Open Space

One way to keep farmland from being developed is for the county to buy the rights to develop the land from farmers. Many local governments across the country buy development rights to farmland. Buying development rights works like this:

- ◆ Farmers volunteer to sell the development rights to their land to the county.
- ◆ The county pays selected farmers the amount they could get for their land if they sold it to a developer minus the value of the land for farming.
- ◆ A farmer who sold development rights would still own the land but they could use it only for farmland or undeveloped open space. If the farmer sold the land, the new owners could not develop the land either.

As an example of how buying development rights works, suppose that developers offered farmers \$10,000 per acre for farmland. This is the value of land for development. Suppose the land is worth \$3,000 per acre for farming. The following table shows what would happen if the farmer sold the land to the developer and what would happen if the farmer sold the development rights to the county.

	If the farmer sells land to the developer...	If the farmer sells,br> development rights to the county...
Amount of money paid to the farmer is...	\$10,000 per acre	\$7,000 per acre
Money is paid to the farmer by...	The developer	The county
After the sale, the land,br> is owned by...	The developer	The farmer
Land use after the sale...	Residential, commercial, or industrial development	Farm or undeveloped open space -- can never be developed

10. *In your opinion, would a program to buy development rights to farmland work in DeKalb County? (Circle one number)*

- 1 Yes --> *(Skip to question 12)*
- 2 No
- 3 Don't know

11. *Why do you think a program to buy development rights might not work in DeKalb County? (Write a short response)*

12. *Of the following things that county government can do to protect open space, which are the three most important to you personally? (Circle three numbers)*

- 1 Enlarging forest/prairie preserves
- 2 Building more hiking and biking trails
- 3 Building more park district parks
- 4 Buying development rights to farmland
- 5 Building more public golf courses
- 6 Building more state parks
- 7 Preserving more wetlands and marshes

13. *Which of the following organizations would you trust most to own development rights to farmland in DeKalb County? (Circle one number)*

- 1 County government
- 2 State government
- 3 Federal government
- 4 A not-for-profit conservation organization

A Program to Preserve Farmland in DeKalb County

Suppose as a last resort to preserve farmland, DeKalb County proposed a program to buy development rights to farmland in the county. The proposed program would work as follows:

- ◆ The county would collect a special tax from each household, each year, for the next five years. It would use the money to buy development rights to farmland in the county in each of the five years.

- ◆ The county would put the development rights in trust with a not-for-profit conservation organization. The organization would sign a legally binding agreement to never let the land be developed. This means that county officials could not change their minds and develop the farmland.
- ◆ The county would use the following criteria to decide which farmland to protect from development:
 - ◇ Scenically beautiful
 - ◇ Highly productive for crops
 - ◇ Likely to be developed soon
 - ◇ Provides good wildlife habitat
 - ◇ Potential to retain water and reduce flooding

There are many reasons to support a program to buy development rights to farmland. People who support such programs have said things like:

- ◆ It is important to protect farmland and open space near where I live and
- ◆ Protecting farmland helps control development.

There are also reasons not to support buying development rights. People who do not support such programs have said things like:

- ◆ There are more important things for my family to spend money on and
- ◆ Farming causes unpleasant odors, noise, and uses dangerous chemicals.

Your Vote on Farmland Preservation

Suppose DeKalb County asked you to vote on whether to raise taxes to pay for the program described on the facing page. If a majority of county residents vote for the program, each household will pay its share of the cost of buying development rights to farmland. If a majority of residents vote against the program, taxes will remain the same.

The following table summarizes the features of the program on which you are asked to vote.

Number of acres of farmland in DeKalb County protected from development over the five year life of the program.	30,000 acres
Percent of all farmland in DeKalb County protected over the five year life of the program.	8 percent
Cost in increased taxes to your household in each of the five years.	\$100.00

14. *Would you vote "for" or "against" the program to buy development rights to farmland in your county. If you vote "for" the program, you will pay \$100.00 more in taxes each year for the next five years and 30,000 acres of farmland in DeKalb County will be permanently protected from development. If you vote "against" the program, your taxes will stay the same and the county will not purchase development rights to any farmland. (Circle one number)*

- 1 Vote for the program
- 2 Vote against the program
- 3 Don't know or no opinion

15. *What are the main reasons you decided to vote the way you did on the program to purchase development rights to farmland? (Write a short response)*

16. *About how far is it from your house to the nearest farmland or natural open space? (Circle one number)*

- 1 Adjacent to your house
- 2 Within one mile but not adjacent
- 3 One to two miles

- 4 Two to five miles
- 5 Five to ten miles
- 6 Ten miles or more

17. Do you, or does someone in your immediate family, work on a farm or in a business closely related to farming? (**Circle one number**)

- 1 Yes
- 2 No

18. In what year were you born? (**Fill in year**)

19. Are you male or female? (**Circle one number**)

- 1 Male
- 2 Female

20. Do you have children of the following ages? (**Circle all that apply**)

- 1 No children
- 2 Children 5 years of age or less
- 3 Children at least 6 but younger than 14 years of age
- 4 Children over the age of 14 who still live at home
- 5 Grown children who no longer live at home
- 6 Grandchildren

21. Please list any environmental or conservation type organizations of which you are a member? (**Circle "1" for none or fill in names**)

- 1 None
- 2 _____
- 3 _____

22. What is the highest grade of school you have finished? (**Circle one number**)

- 1 Grade school only
- 2 Did not finish high school
- 3 High school or GED
- 4 Vocational or technical school
- 5 Some college
- 6 College graduate (BS or BA)
- 7 Some college or professional school
- 8 Graduate degree (PhD, MD, MA, MBA)

23. Which choice below best describes your household's expected before tax income from all sources for 1997? (**Circle one number**)

- | | |
|------------------------|---------------------------|
| 1 \$0 to \$9,999 | 8 \$70,000 to \$79,999 |
| 2 \$10,000 to \$19,999 | 9 \$80,000 to \$89,999 |
| 3 \$20,000 to \$29,999 | 10 \$90,000 to \$99,999 |
| 4 \$30,000 to \$39,999 | 11 \$100,000 to \$109,999 |
| 5 \$40,000 to \$49,999 | 12 \$110,000 to \$149,999 |
| 6 \$50,000 to \$59,999 | 13 \$150,000 to \$199,999 |
| 7 \$60,000 to \$69,999 | 14 \$200,000 and above |

If you have any comments about this questionnaire or the project, please write them here.

When you are finished with the questionnaire, please place it in the enclosed business reply envelope, and return to:

*Douglas Krieger, Project Director
American Farmland Trust
Center for Agriculture in the Environment
P.O. Box 987
DeKalb, IL 60115*

Thank you very much for your help.

TEXT OF FIRST COVER LETTER

September 15, 1998

[Respondent ID]

[First name] [Last name]
[Address]
[City], [State] [ZIP Code]

Dear [Salutation] [Last name]

I am writing to you because I would like to know your opinions about preserving farmland in [County name] County. As the population of [County name] County grows, many of the new homes and businesses are being built on farmland. Some people are concerned about this loss of farmland open space. Others think that economic growth and development are more important.

The American Farmland Trust Center for Agriculture in the Environment, at Northern Illinois University, is conducting this study to learn about the opinions of people like yourself regarding land use and farmland preservation. We will share this information with local government officials who make decisions about land use in [County name] County. The study will give them the information they need to make decisions that are consistent with the kind of land use you want. Filling out this questionnaire is your chance to let local officials know how you would like land to be used in [County name] County.

Your response to this survey is important no matter what views you have on preserving farmland and open space. To accurately describe the opinions of county residents we need to hear from all kinds of people, those who think preserving farmland and open space is important as well as those who do not. The questionnaire should be filled out by the person(s) in charge of making decisions for the household. It should not take more than 15 minutes to complete.

Your participation in the survey is completely voluntary. Your answers to questions will be completely confidential. We will never make available information about who returned questionnaires. We will not make your name or address available to anyone else and you will not be put on an American Farmland Trust mailing list.

Thank you for your help with this study.

Sincerely,

Douglas Krieger, Ph.D.
Project Director

TEXT OF SECOND COVER LETTER

October 6, 1998

[Respondent ID]

[First name] [Last name]
[Address]
[City], [State] [ZIP Code]

Dear [Salutation] [Last name]

About three weeks ago I sent you a questionnaire asking for your opinions about land use and farmland preservation in DeKalb County. I have not yet received your completed questionnaire.

I am writing to you again to remind you to complete and return the questionnaire. It is important that I hear from you. I sent the questionnaire to a small sample of households in DeKalb County. For the results to accurately represent the opinions of county residents, it is important that each person in the sample complete and return the questionnaire.

We will present the results of this survey to county officials so they will know whether preserving farmland and open space is important to county residents or not. This is your chance to let these officials know your opinions about land use and development in DeKalb County.

The questionnaire should be filled out by the person(s) in charge of making financial decisions for the household. The questionnaire should not take more than 15 minutes to complete.

Your participation in the survey is completely voluntary. If you do respond, your answers to questions will be kept completely confidential. We will never make available information about who returned questionnaires. I will not make your name or address available to anyone else and you will not be put on an American Farmland Trust mailing list.

In case your questionnaire has been lost or misplaced, I have included a replacement with this letter.

Thank you for your help.

Sincerely,

Douglas J. Krieger, Ph.D.
Project Director

TEXT OF THIRD COVER LETTER

November 3, 1998

[Respondent ID]

[First name] [Last name]
[Address]
[City], [State] [ZIP Code]

Dear [Salutation] [Last name]

I am writing once again in the hope of convincing you to fill out and return the enclosed questionnaire. I realize that you may be busy or not interested in the survey. I do hope, however, that you will take the time to fill out and return the questionnaire as soon as possible.

I know from experience that the opinions of those who have not yet returned the questionnaire are probably different from the opinions of those who have. The results of this study are likely to influence future land preservation efforts in DeKalb County. We can accurately describe county residents' opinions about these issues, however, only if we hear from you and others who received the questionnaire. Your opinions are very important whether you support the preservation of farmland and open space or not.

I am enclosing a final copy of the questionnaire in case the others did not reach you or have been misplaced. I urge you to take a few minutes to complete and return the questionnaire.

I will be happy to send you a copy of the survey results. If you would like to receive the results simply indicate that on the back of the questionnaire. I expect to have the results ready by early next year.

I greatly appreciate your contribution to our efforts to learn more about DeKalb County residents' attitudes about preserving farmland and open space.

Sincerely,

Douglas J. Krieger, Ph.D.
Project Director

TEXT OF REMINDER POSTCARD

September 22, 1998

Dear [Salutation] [Last name]

Last week you should have received a questionnaire asking for your opinions about preserving farmland in [County name] County.

If you have already filled out the questionnaire and returned, it I thank you very much for your help. If not, please do so today. It is important that we receive your response for the results to accurately represent the opinions of county residents. Your response will be greatly appreciated.

Sincerely,

Douglas J. Krieger, Ph.D.
Project Director

[Respondent ID]

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Appendix B Introduction

This report summarizes findings from eight focus groups about issues related to farmland protection. The focus groups represent one component of an ongoing study designed to quantify the non-farm benefits of farmland. The larger study used the contingent valuation method to estimate the economic value of farmland protection in the vicinity of Chicago, Illinois – a region characterized by prime farmland and rapid urban expansion. The focus groups were conducted in eight communities near Chicago that have recently experienced relatively rapid population growth and the consequent loss of open space and farmland. The focus group discussions generated qualitative information for use in developing a contingent valuation questionnaire to assess household willingness to pay for farmland protection. In this regard, the focus groups explored participants' perceptions of and experiences with farmland and open space, their preferences for development patterns and protection efforts and the concepts and language they used to think about and discuss these issues. The focus groups represent a crucial first stage in designing a contingent valuation questionnaire that addresses issues of concern to respondents, communicates clearly about those issues and elicits the desired quantitative estimates of economic value. This report begins by briefly describing the objectives of the focus groups. It then reviews the procedures used to recruit participants and describes the conduct of the groups. The main body of the report summarizes focus group findings relative to study objectives.

Focus Group Objectives

Focus groups are structured discussions with small groups of individuals. Typically, a moderator initiates the discussion, introduces the topics of interest, guides the flow of the discussion and probes participants for additional information or detail. Focus groups are particularly useful for exploring individuals' attitudes, opinions and behaviors and for learning the concepts and language participants use to think about and discuss the topics of interest. Focus group participants are not generally randomly selected. Their comments are also elicited within the context of a group discussion. Focus groups are not, therefore, well suited to collecting information that statistically represents a general population. In the context of this study, focus groups contributed to the development of the contingent valuation questionnaire. A CV questionnaire uses a constructed market to elicit values for the non-market good or service of interest – in this case, farmland protection. A "valuation" section of the questionnaire describes the good or service of interest, defines a market-like choice setting that specifies a tradeoff of money for the good or service in question and elicits a choice from the respondent that reveals the economic value of the good or service. To provide valid estimates of the desired economic value, respondents must (1) clearly understand the characteristics of the good or service they are asked to value, (2) understand and accept the rules of the "market" used to elicit values for the good and (3) have no incentive to respond strategically or untruthfully.

Focus groups can be used to address a number of issues of questionnaire development. First, an understanding of respondents' concept of a good aids in developing a questionnaire that focuses on characteristics of the good that are relevant to respondents. Second, using language with which respondents are familiar – terms introduced by focus group participants – facilitates comprehension of the questionnaire. Third, focus group trials of valuation scenarios can reveal objections, misunderstandings and possible strategic responses that may interfere with value elicitation. Finally, focus group discussions can lead to formulation of hypotheses regarding other factors that may influence values. Questions can then be developed to collect information about these factors.

Focus group moderators employed ethnographic interview techniques. Ethnographic methods reveal distinctions that are meaningful to people by focusing on how people classify concepts and experiences. For example, asking participants to identify and compare different types of open space revealed the characteristics that defined open space for participants and identified important differences between types of open spaces. Asking about how participants used open spaces revealed more about differences between types of open space and provided an experiential basis for the relevance of those differences.

The focus groups in this study were carefully structured to collect specific information. Of particular interest were participants' perceptions of open space and of farmland within the wider context of open space in general. The discussions also focused on attitudes about development of open space and farmland, the impact of open space and farmland on daily lives and activities and opinions about programs to protect farmland and open space. Following a brief overview of focus group procedures, the remainder of the report reviews the focus group results.

Focus Group Procedures and Schedule

Focus group participants were recruited from communities in Kane, McHenry and DeKalb counties in northeastern Illinois. Selected communities encompassed a range of experience with development of farmland and open space. Kane and McHenry counties are experiencing rapid growth and loss of open space as the population of the Chicago area spreads westward. DeKalb County is a predominantly rural county immediately to the west of Kane County and is not yet experiencing the rapid growth rates of its western neighbors.

Table B.1 lists the date, location, number of participants and moderator for the eight focus groups. Participants in the first two groups, conducted in Harvard and Shabbona, were recruited from the membership of the United Methodist Church and United Church of Christ respectively. The Public Opinion Laboratory at Northern Illinois University recruited participants for the remaining six focus groups from purchased lists of residential telephone numbers. The Public Opinion Laboratory screened potential participants to obtain a group that roughly represented the community in terms of age, gender and income. The focus groups ranged in size from seven to 15 participants.

Experienced moderators from the Center for Governmental Studies at Northern Illinois University conducted seven of the eight focus groups. The consultant in charge of the project moderated the focus group in Crystal Lake. The groups met in local park district or hotel conference rooms rented for that purpose. Each group was recorded on audio and video tape to provide a complete and permanent record of the discussion.

<i>Table B.1. Focus Group Schedule</i>			
Date	Location	Number of Participants	Moderator
July 21, 1997	Harvard	7	Carol Zar
July 22, 1997	Shabbona	8	Carol Zar
October 1, 1997	Huntley	15	John Lewis
October 2, 1997	DeKalb/Sycamore	12	John Lewis
October 6, 1997	Crystal Lake	10	Douglas Krieger
October 7, 1997	St. Charles	15	Carol Zar
October 8, 1997	Naperville	7	Carol Zar
October 9, 1997	Elgin	7	Carol Zar

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