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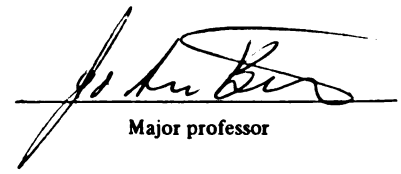

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THE IMPACT OF AN URBAN STORMWATER CONSTRUCTED WETLAND ON RESIDENTIAL PROPERTY VALUES: A CASE STUDY OF THE TOLLGATE WETLAND

By

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ABSTRACT

THE IMPACT OF AN URBAN STORMWATER CONSTRUCTED WETLAND ON RESIDENTIAL PROPERTY VALUES:
A CASE STUDY OF THE TOLLGATE WETLAND

By

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With the advent of Phase II of the Clean Water Act many municipalities are faced with the difficult task of selecting the most appropriate and fiscally responsible stormwater management practices in which to invest. This study evaluates the impact of one type of stormwater control, a constructed wetland, on residential property values near the Tollgate Wetland in Lansing, Michigan. Using a case study design, the study included interviews with local real estate experts, a survey of nearby residents, and development of a hedonic pricing model. The results of the hedonic analysis indicate that the Tollgate is not a significant influence of sale price in the neighborhood. However, as shown by the survey and expert interviews there is little doubt that people in this area value the wetland. This is especially important considering the neighborhood contains a relatively large amount of open-space amenities including the wetland, a local park, school and golf course. In addition, the wetland may indirectly have a positive impact on property values as a result of its value as a neighborhood asset and its function as a stormwater control.

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CHAPTER 1 - INTRODUCTION

Over the last thirty years public concern regarding water quality and wastewater pollution has resulted in regulations aimed primarily at point source control. Tremendous improvements have been made, and control of point sources from industry and sewage treatment plants has led to cleaner aquatic environments. However, according to the National Water Quality Inventory conducted in 1996: 13 percent of impaired rivers, 21 percent of impaired lakes and 45 percent of impaired estuaries surveyed are affected by urban stormwater runoff, a type of non-point source pollution (NPS) (U.S.EPA 2000). NPS arises when stormwater runoff flows across roof tops, pavement, feedlots and farm fields and carries contaminants from these surfaces into nearby surface waters. The emerging need to address NPS is evidenced in the United States by legislative actions such as the strengthening of the Resource Conservation Act in 1989 (Peterson 1998) and the implementation of Phase II of the Clean Water Act.

The Clean Water Act (CWA) requires that certain municipalities and construction sites utilize practices to address non-point source pollution. The second phase of this regulation increases the number of municipalities and construction sites that fall within the scope of regulation (U.S.EPA 2000). The law requires that these newly regulated municipalities submit a stormwater management plan to the EPA by March of 2003, and construction sites greater than one acre have a stormwater pollution prevention plan.

Some of these newly regulated municipalities may want to implement plans that include the costly construction of stormwater control devices such as wet or dry detention basins. However due to the smaller size of the municipalities regulated under Phase II (U.S.EPA 2000), the difficult fiscal situation prevailing in many cities and escalating

urban land values; it seems unlikely that systems requiring land area will receive much consideration.

One such type of land intensive stormwater control is the Constructed Wetland (CW). CW systems replace the petro-chemical inputs of traditional wastewater treatment with solar and biological energy, thus providing a more sustainable treatment technique (Campbell and Ogden 1999). The CW has been successfully put into operation around the world, with over 650 reported in 1996 in the U.S. and Canada (Kadlec and Knight 1996). CWs have proven very effective in treating stormwater (Kadlec and Knight 1996) doing so by means of a variety of physical, biological and chemical processes. As mimics of natural systems, CWs are inherently attractive to wildlife and can contain a wide variety of plant species.

This unique combination of water, wildlife and plants (especially in an urban setting) has the potential to be a strong attraction for people as well. Drawn by the possibility of viewing aquatic wildlife or the simple calm of a sunset on the water, CWs are increasingly being viewed as an aesthetic attraction for humans.

Problem Statement

Municipalities and decision makers are often required to make a cost-benefit analysis of public expenditures. Contemporary conventional wisdom among many elected officials and decision makers is that "open space" in urban areas is a costly investment from which a community receives little or nothing in economic return (Crompton 2001). This perception probably holds true for the construction of land intensive constructed wetlands, regardless of their effectiveness in treating NPS.

Open space advocates believe that this thinking is flawed. They argue that a significant percentage of taxed property value is derived from amenities that are off the tax roll, such as local schools, parks and other protected areas (Crompton 2001). If this thinking holds true, would the same apply for properly designed CWs? If so, the complete value of these systems includes property value impacts in addition to water storage (flood protection) and improved water quality.

Wetland valuation studies have, in general, shown that natural wetlands have positive economic, social and biological value. As such, they contribute to human welfare (Costanza, d'Arge et al. 1997; Woodward and Wui 2001). Most econometric wetland studies found in the literature have focused on natural wetlands (Mahan 1997; Lupi et al. 1991; Doss and Taff 1996), and the relatively few specifically addressing the property value impacts of stormwater controls are primarily anecdotal (U.S.EPA 1995; Partnership 1996). However, all of these studies indicate that proximity to either stormwater controls or natural wetlands affects proximate property value in a positive manner. There are few published econometric studies specifically examining constructed wetlands and their effect on property values. Knowing the relationship between constructed wetlands and property values would aid municipalities in evaluating the fiscal desirability of CWs as a means of achieving Phase II compliance.

Another important facet of determining the value of constructed wetlands is the perceptions of proximate property owners and residents. There have been few analyses conducted on the societal response to stormwater controls (Debo 1977; Baxter, Maulamoottil et al. 1985; Adams, Franklin et al. 1986; Emmerling-DiNovo 1996) and none specific to stormwater CWs. Do proximate property owners value these systems,

and if so what is the relationship between these perceptions and the economic, ecological and social functions of CWs? An understanding of these relationships will not only allow an optimization of stormwater CW systems, but may also lend support to decisions made for or against their use, and the regulations that require them.

This study attempts to answer these questions by coupling an econometric technique known as hedonic price analysis with a face-to-face survey of property owners residing in an urban neighborhood containing a stormwater CW, known as the Tollgate Wetland.

Study Area: The Tollgate Constructed Wetland

As a consequence of a City of Lansing 30-year management plan, the Tollgate Drainage District was mandated to implement a sewer separation project. This district is made up of the Groesbeck neighborhood, and the Groesbeck Municipal Golf Course both within Ingham County, MI. Part of the unique nature of the Groesbeck area is the fact that both the City of Lansing and the Charter Township of Lansing have jurisdiction over distinct sections of the neighborhood. This neighborhood, established in the 1950s, has steadily grown with the addition of minor subdivisions in the 60s, 70s and 80s and is now bounded by major thoroughfares. Traditionally known as a well kept, affordable and blue collar area, the neighborhood has a good to excellent reputation with Lansing residents.

The selection of CW technology grew out of the necessity to find a cost efficient solution for neighborhood storm water disposal. Initial estimates in excess of 20 million dollars were deemed unacceptable, as the full cost of construction would be covered

exclusively by an assessment of the commercial properties, apartment buildings and 554 residential properties within the 225-acre district (Lindemann 1999).

The Tollgate CW's primary design objective was to store and treat the storm water runoff from the mixed-use watershed. Construction of the CW began in 1996, and the system went into operation in September of 1997. A 12 acre pre-existing public park located in the neighborhood was re-contoured to create ponds, waterfalls, wetland, spillways and a peat sand filter. The system was designed to have enough storage for a 100-year, 24-hour storm event (approximately 35.8 acre-feet of water). Other important design features include: recreational amenities, such as walkways and benches; native vegetation; a layout and vegetation scheme intended to attract wildlife; a public education component; and an outlet for an adjacent golf course water hazard.

Organization of Thesis

A literature review is included in Chapter 2. Chapter 3, Research Methods, explains the study design and methodology. Chapter 4, Data Collection, discusses the way in which the data used for the study was collected, and includes a description of the data. The analysis and results of the data are presented in Chapter 5. Chapter 6, Conclusions and Recommendations, concludes the thesis with a discussion of the results and their implications for this and future research.

CHAPTER 2 - LITERATURE REVIEW

This chapter reviews three areas of literature pertinent to this study.

1. Hedonic valuation of natural wetlands, and water resources.
2. Property value impacts of open space, public parks and CW.
3. Survey research concerning residential stormwater impoundments.

Hedonic Studies in Natural Wetland Valuation

Three key hedonics studies have been conducted on the impact of wetlands on property values in the United States. These studies have been situated in Portland, Oregon (Mahan 1997; Mahan, Polasky et al. 2000) and Ramsey County (St. Paul), Minnesota (Lupi, Graham-Tomasi et al. 1991; Doss and Taff 1996).

The Portland study assessed the value of natural urban wetlands utilizing hedonic pricing (Mahan 1997; Mahan, Polasky et al. 2000). The study used a data set containing 14,200 observations representing home sales within Multnomah County (Portland), Oregon for the two year period (1992 – 1994). Real estate data for this study was provided by assessors' records, and the distance variables were generated using regional geographic information systems (GIS) data. Typical neighborhood and structural independent variables were included in the model. The environmental variables, such as distance to the nearest wetland and wetland characteristics, were also included. The authors based the classification of wetland types upon a simplified Cowardin system, a common wetland classification technique (Cowardin 1979). The dependent variable (sale price) was screened for bias; only data for arms-length or true market, warranted

transactions were included. The prices were adjusted by a price index and expressed in May 1994 dollars.

Two models (Model I and Model II) were developed, each based upon different assumptions about the wetland/property value relationship. Model I assumes that it is the characteristics of the nearest wetland (size, distance, type) that affect property value, while Model II assumes that it is the distance to the nearest wetland of each type that influences property values.

The results of Model I indicated a positive value of proximity to wetlands; reducing the distance to the nearest wetland of any type by 1000 feet increases home value by $436.17. Model II produced mixed results, leading the authors to conclude that while distance to and size of nearby wetlands influenced homebuyers, the type of wetland did not.

The Doss and Taff (1996) study of Ramsey County (St. Paul), Minnesota utilized a model similar to Model II in the Portland study, in that it estimates the nearest distance parameters to four wetland types: open water, emergent vegetation, scrub-shrub and forested. The researchers sought to determine the relative preferences for proximity to the same broad types of wetlands; however they limited the distances to 0.6 miles.

The data collected for this study included only those wetlands within Ramsey County. The wetlands were classified and only properties that were within a 1000 feet of each type were included, leaving 32,417 single-family residential home sale transactions out of 106,049 to be used in the model.

The authors assumed that the home values were based upon structural and location attributes, including distance to wetlands. The results of this study "clearly

(exhibit) a relationship between property value and distance to wetlands" (Doss and Taff 1996, p. 127). The study found that moving an additional 10 meters closer to an open-water wetland increases a home's value by $99, towards an emergent wetland by $136, towards a scrub-shrub wetland by $145, and towards a forested wetland by $145. Doss and Taff (1996) concluded that their estimates provide a lower bound of wetland value, and suggest the inclusion of public values, such as scenic value or the presence of wildlife habitat.

In an earlier study, Lupi, Graham-Tomasi and Taff (1991) also used Ramsey County (St. Paul), Minnesota for their study. This study measured the influence of the number of wetland acres in a survey section on housing prices within that section. Unlike the studies described above, this study did not include location point data or wetland characteristics. Over 18,000 residential property sales were included in the data set, representing home sales from 1987 to 1989 in Ramsey County, Minnesota.

The wetland data used was collected from the Minnesota Dept. of Natural Resources' Protected Water and Wetlands Inventory (PWI). Lupi et al. (1991) used an ordinary least squares regression and utilized the LIMDEP™ software program to estimate and graph the linear hedonic function in all variables except wetlands.

The authors found a significant positive relationship between protected wetland acres per section and property value. Significant to the Tollgate research, this study found that when holding housing density equal, changes in wetland acreage are relatively more valuable in sections with low wetland acreage as opposed to sections with a higher acreage.

While influence of individual wetlands on nearby property values cannot be determined using the section-wide approach, the authors do infer from the results that property values diminish as wetland distance increases, suggesting that wetlands have a "neighborhood effect".

Hedonic Studies of Water Resource Valuation

Real estate agents and property buyers have long been aware of the "waterfront effect". A home situated by a stream, lake or river costs more to buy or rent than a more distant one (Schueler 2000). There are a number of hedonic property studies on water resources, with most focusing on estimating the amenity values for lakes. A comprehensive summary of these studies can be found in Mahan (1997), see Table 1.

Table 15. Water resource valuations using hedonics, adapted from Mahan (1997)

AUTHOR - LOCATION	RELEVANT ENVIRONMENTAL VARIABLE	COMMENT
Brown & Pollakowski (1976), Seattle, WA	Lake view -Distance to water front	Property values increase with closer proximity to lake.
d'Arge & Shogren (1989), Okoboji Lakes, IA	Lakefront footage	Property values greater with increased water quality.
Knetsch (1964), Tennessee Valley, TN	Reservoir-front property - Distance to reservoir	Reservoir-front property has greater value.
Kulshreshtha & Gillies (1993), Saskatchewan, Canada	River view	Property values increased by view of river.
Streiner & Loomis (1995), Contra Costa, Santa Cruz, Solano Counties, CA	Restoration project -Stream	Restored streams increased property values by $4,500 to $19,000.

The information provided by this literature suggests that a properly designed CW can enhance nearby property values. The Knetsch (1964) study of reservoirs is of

particular importance as it suggests that constructed water bodies share a similar property price effect with natural water bodies.

Public Parks and Open Space

In general, people are willing to pay a larger amount for a property located close to a public park (Crompton 2001). This relationship is described as the "proximate effect" that could apply to most neighborhood amenities. The principle is explained by Crompton (2001, p.1) as follows:

> The premise that parks and open space have a positive impact on property values derives from the observation that people frequently are willing to pay a larger amount of money for a home located close to these types of areas, than they are for a comparable home further away. If this observation is empirically verified, then owners of the enhanced property are likely to pay higher property taxes to governments because of the increase in the property's appraised value. In effect, this represents a "capitalization" of park land into increased property values for proximate land owners. Conceptually, it is argued that the competitive market will bid up the value of property just equal to the capitalized value of the benefits that property owners perceive they receive from the presence of the park or open space.

Compton's contention has been supported by a number of studies. Based upon a 2001 hedonic study conducted in Greenville, South Carolina, Espey and Owusu-Edusei (2001) concluded that public parks do positively impact proximate property values. The authors investigated property effects generated by different types of parks. The parks were typed based upon size and usage. They found that in some cases property within 300 feet was negatively impacted while homes within 300 and 500 feet experienced a positive value effect. This negative then positive effect may be due to parks experiencing a very high recreational use. The results indicated that medium sized parks had a

significant effect on property extending out 1500 feet from the park (Espey and Owusu-Edusei 2001).

In another hedonic study in Portland, Lutzenhiser and Netusil (2001) found that homes located within 1500 feet of a natural area park experienced an increase in property value. Comparing homes in proximity to natural area parks, versus more urbanized parks, the authors found that the natural area parks had a greater impact (Lutzenhiser and Netusil 2001).

Reviewing 30 empirical studies which investigated the extent and legitimacy of the proximate effect, Crompton reported that "a positive impact of 20% on property value abutting or fronting a passive park area is a reasonable starting point. If it is a heavily used park catering to large numbers of active recreation users, then the proximate value may be incremental on abutting properties, but may reach 10% on properties two or three blocks away" (2000, p. 1)

These studies bring to light an issue that may be important to the Tollgate research. As a facility that encourages recreational users, could this kind of use influence the hedonic model? To address this issue a zonal approach was explored, stratifying home sales in the Groesbeck neighborhood based upon a distance range to the Tollgate.

Constructed Wetland Valuation

In September 1995, the Office of Wetlands, Oceans and Watersheds within the U.S. Environmental Protection Agency (EPA) published a study on the benefits of runoff controls, including detention ponds and constructed wetlands, on nearby property values (U.S.EPA 1995). By interviewing both real estate experts and experts in the management

of urban stormwater control structures and reviewing literature, the authors of the study estimated a 5% to 30% premium for waterfront properties. Two case studies of developments utilizing CWs in Kansas and Colorado exhibited premiums of $20,000 and $35,000 respectively on homes located near the CW. These premiums were attributed to the scenic value provided by locating homes in close proximity to the constructed wetlands.

Several factors that contributed to the amount of the premium were noted. Foremost was the size of the wetland or pond, and secondly the presence of aesthetic or recreational amenities (Schueler 2000). This unique research suggests that CWs do have an influence on proximate property values. However, this study focused solely on new residential developments, quite unlike the established neighborhood of interest in the Tollgate study.

Residential Surveys on Stormwater Controls

Using a survey of residents and interviews with local officials, Baxter et al. (1985) examined the perceptions of residents living around two man-made stormwater impoundments (4.3 and 10.5 acres) in the city of Mississauga, Canada. Residents perceived that the lakes positively influenced their property value (49%), attracted potential home buyers (10-60%) and helped foster a sense of community (Baxter et al. 1985).

By surveying residents in seven Illinois subdivisions containing stormwater impoundments, Emmerling-DiNovo (1995) examined perceptions of the image and value of developments in relation to the impoundments. The results indicated that residents

believed wet basins in the neighborhood positively impacted proximate property value, and significantly contributed to the image of a subdivision. When given a locational choice, that included adjacency to a golf course or park, respondents answered that adjacency to a wet basin was the most preferred (Emmerling-DiNovo 1996).

In a study examining the attitudes of residents living near four man-made lakes (6-48 acres in size) in Atlanta, GA, Debo (1977) found that residents felt that the lakes had a positive impact on the value of their homes (40-100%) and was a positive factor in their decision to purchase a home (22-93%) (Debo 1977).

As a part of a larger study, the National Institute for Urban Wildlife surveyed 600 homeowners in Columbia, Maryland (Adams, Franklin et al. 1986). They found that 98% of respondents enjoyed viewing wildlife that made use of the city's stormwater impoundments, and 75% indicated that permanent water bodies added to real estate values.

The results of these studies indicate that residents value stormwater impoundments, particularly those that incorporate an open water feature. Although these studies did not specifically examine CWs, the Tollgate system does have several open water areas which would indicate that nearby residents may share the perceptions of the respondents in these studies. Two factors distinguishing the study areas in the above mentioned research from the Tollgate study area, are the smaller size of the Tollgate CW open water features (approximately 30 to 50% of the total 12 acre site), and that recreational access is confined to the periphery of the site. No access is allowed to the actual open water areas of the CW. These factors may lower residents' expectations of a positive property value impact.

CHAPTER 3 - RESEARCH QUESTIONS AND STUDY METHODS

Research Questions

The study focused on the following research question: Has the Tollgate Wetland had a positive or negative effect on the value of proximate residential properties? Sub-components of that question include:

1. What is the magnitude and aerial extent of any impact?
2. Do nearby residents perceive that the constructed wetland has had a positive or negative impact on their property value?
3. What other impacts do these residents associate with the constructed wetland?
4. Do real estate industry representatives perceive that the constructed wetland has had a positive or negative impact on property values?
5. Are residents' perceptions of impact consistent with empirical determination of the effect on property values?

Hypothesis

H1. The Tollgate Constructed Wetland will have a positive impact on the value of proximate residential property.

H2. The impact on the value of residential property will be significantly correlated with a property's proximity to the wetland (i.e. the shorter the distance the more positive the impact on property value).

H3. The residents' perception of the Tollgate's impact on the value of their property will be significantly correlated with a property's proximity to the wetland (i.e. the shorter the distance the more positive the impact on property value).

Methods

The study employed a multi-method approach, the main elements of this research included:

1. Interviews with real estate industry representatives.
2. An attitudinal survey of residents living in proximity to the wetland.
3. A hedonic pricing analysis.

This multi-method study design allows for triangulation or convergence of results.

Real Estate Interviews

In-depth interviews were conducted with real estate agents and property appraisers familiar with the study area to obtain their perceptions of the impact of the Tollgate CW on property values. These interviews were also used to gain insight to the study area's important characteristics and features to assist in the development of the hedonic pricing model and delineation of the study area for the survey of residents.

Interviews were conducted with six real estate professionals familiar with the Groesbeck neighborhood, four real estate agents and two property appraisers. These semi-structured face to face interviews utilized an interview guide (see Appendix 1) to ensure consistency in data collection. Realtors were selected by contacting leading real estate firms and asking sales managers to recommend agents familiar with the Groesbeck neighborhood. The appraisers were selected by asking the realtors interviewed to recommend an appraiser familiar with the Groesbeck neighborhood. The interviews

generally lasted one hour, and were taped with the interviewee's permission. Each of the recorded interviews was transcribed by the researcher and subjected to content analysis.

Survey of Residents

A face to face questionnaire was administered to residents living in proximity to the wetland (see Appendix 2). Drawing upon the published research regarding proximity effects (Crompton 2001; Espey and Owusu-Edusei 2001; Lutzenhiser and Netusil 2001), which suggested properties within 1500 of a park or open space could reasonably be expected to receive a property value impact, a sample area was determined. An attempt was made to contact all residents within 1000 feet of the center mass of the Tollgate Wetland. A second round of surveying was conducted on all residents lying on a 1500 foot radius from the Tollgate Wetland. This subsequent round of surveying was an attempt to capture the aerial extent of residents' perceptions of the Tollgate's property value impact. The radius approach was utilized due to a limited availability of resources.

This survey was used to determine resident perceptions of the impact of the constructed wetland on property values and any other perceived positive or negative impacts of the constructed wetland. The survey results were also used to gain an appreciation of residents' general feelings about their neighborhood and the characteristics of that neighborhood that may affect property values in the area. Each respondent was asked a series of closed and open ended questions concerning both general neighborhood characteristics that may affect the value of their property as well as questions specific to the Tollgate and its property value impact. The questionnaire was

pre-tested with 6 residents who live in the general vicinity but outside the study area. All interviews were conducted by the researcher to ensure consistency in data collection.

As the focus of the survey was to gauge the perceptions of residents that owned property a visual inspection was made of the study area prior to the sampling. Any suspect properties (apartment buildings, businesses) were noted and were dropped from the sample population upon confirmation that they were not residential property. This confirmation was made via internet access to Ingham County property tax database (http://www.ingham.org/tr/test_connection_to_bs.htmL). To contact potential respondents the researcher went door to door asking residents if they would be willing to be interviewed. If the residents agreed, they were assured of confidentially and given a document that contained an explanation of their rights as subjects of human research as well as contact information for the researcher. Sampling took place over a two month period (8-15-02 to 10-12-02). A protocol for the time of day and number of attempts at contacting a potential respondent was adhered to over the sampling period. Sampling took place on Thursday, Friday and Saturday during the weeks of 8-15-02, 8-22-02, 9-5-02, 9-19-02, 9-26-02, and 10-10-02. The researcher generally made attempts to contact potential respondents from 1000hrs to 1200hrs, from 1300hrs to 1500hrs, and from 1700hrs to 1900hrs.

The completed questionnaires were coded and the data entered into Statistical Products and Service Solutions, SPSS, for analysis. Frequency tests were run for each of the questions, percentages and means for of each response were calculated for the entire set, and both sub-sets of the population (within 1000' and on 1500' radius).

Conclusions were drawn from these results and appropriate figures and tables were produced to help in explaining the survey results.

Hedonic Pricing Model

Hedonic pricing utilizes a method that estimates the implicit price of characteristics that differentiate closely related products (Rosen 1974; Perman et al. 1996). An environmental amenity, such as scenic value, provided by a nearby wetland is not an object that can itself be traded. In other words, "the right to live by a wetland" is not commonly marketed, but is a valuable attribute to some people (Taff 1992). As a result, this attribute does not have a market price; therefore we cannot use its price to reveal preference for living next to a wetland (Kaplowitz 1997). However, this appeal or preference may be reflected in the observable price of properties near the wetland. Relying on variations in residential property values, the hedonic method reveals the implicit prices for each of the property attributes, while holding all other attributes constant. These implicit prices can then be used as a measure of the value of marginal changes in all of the attributes included in the model. The general price function is discussed in the following paragraph.

The price of a house reflects the value of a bundle of its attributes. The hedonic equation seeks to track the "true price", the dollar value that is agreed upon by willing buyers and sellers, each with full information and without coercion (Doss and Taff 1996). In hedonic models regarding property value and housing prices, attributes are assigned to three characteristics: structural characteristics, neighborhood characteristics and

environmental characteristics. Assuming the housing market is in equilibrium and the prices are market clearing, the price of a house can then be represented as:

$$P_i = f(S_i, N_i, E_i)$$

where P_i is the price of the house, S_i is a vector of structural characteristics, N_i is a vector of neighborhood characteristics and E_i is a vector of environmental characteristics.

For this study, a hedonic price model was developed utilizing data made available by the two local municipalities in the Groesbeck neighborhood. The model was created to provide a revealed and objective method of determining property value impacts of the Tollgate CW. The data used in the model was collected from both the City of Lansing assessor's office and The Charter Township of Lansing's assessor on all of the reported residential property transactions within the study area. This data set includes home sales from September of 1997, the Tollgate's initial month of operation, to the summer of 2002.

The transaction information used for the model was screened for bias, and included only residential arms-length transactions. Interfamily sales, trades, sheriff sales, commercial sales, sales without warranty deeds, and sales of less than $10,000 were filtered from the data set. This left a total of 269 residential sales to be included in the model. An attempt was made to verify some of the structural characteristics of the homes. Taking a random sample of the residences, a site visit to the property was made to confirm characteristics such as garage area, and style of home. This verification process indicated that some of the structural information was incorrect, particularly the style of home. As such, the data concerning home style was left out of the model. This

information is most likely highly correlated to square footage of the home and therefore is not crucial to the analysis.

Collinearity is often an issue addressed in hedonic studies. If some variables in the function are correlated, the imprecision of the estimates produced by the model are increased. On the other hand, in order to clearly delineate the effects of an environmental characteristic on the dependent variable, the analysis must control for the effects of other pertinent characteristics. The tradeoff between bias and reliable estimates receives little help from hedonic theory, and its resolution is left to econometric fine-tuning. As a general rule of thumb, variables with simple correlations higher than .80 are said to be a concern (Mahan 1997). No correlations between variables were found to exceed this value. Correlation statistics between the variables utilized in the basic model are presented in Table 1 of Appendix 4.

The data was entered into SPSS for analysis. An ordinary least squares regression using a linear functional form was run on several different models. Each model specification included different sets of independent variables, but the same dependent variable (sales price of the home). Conclusions were drawn from these results and appropriate graphs and tables were produced to help in explaining the results of the regression.

Limitations of the Methods

The combination of these three research methods, while allowing for the collaboration of results from each of the different techniques, also creates the potential for multiple sources of error.

Survey/Interview Limitations

The response rate and sample size are limiting factors. Despite the survey protocol described above, only 36% of the surveyed households agreed to be interviewed. While this is not an unreasonable response rate, the fact that the sample population was small (127 households) makes the relatively small number of respondents a limiting factor. The age and gender of the respondents was not officially recorded, however anecdotally a fairly large percentage of those that answered the survey were of retirement age, and female. These factors may serve to limit the certainty of the survey results.

Hedonic Limitations

The primary limitation of this technique is that it can only measure a subset of use values indirectly associated with the market value of related good [Freeman, 1993]. All the variables that may influence a homebuyer's and seller's decision can't be included.

Another possible limitation could be the lack of information that consumers might have about the qualities of living near a wetland. For example, it was once widely believed that wetlands were the source of disease (Vileisis 1999). If consumers within a geographic area contained a number of people who thought this way about wetlands, the hedonic estimation may be biased. However, recent studies indicate that the services of wetland such as recreation and flood storage are well recognized by ordinary citizens (Azevedo, Herriges et al. 2000).

An issue commonly cited in hedonic literature is separability of consumer preferences. Many hedonic models assume weak separability of demand, allowing the consumer demand for living next to a wetland to be estimated independently of other

demand equations for other goods purchased (Mahan, Polasky et al. 2000). Standard demand theory and applied studies of consumer demand cast doubt on the validity of weak separability (Perman, Ma et al. 1996).

An issue of note, specific to the model presented here, is the relatively small sample size used in this research. Although statistical significance is possible with a sample of 269, this sample size is an order of magnitude lower than any of the hedonic studies presented in the literature review. These studies are also distinct from the research presented here in that they focus on the effect of many, natural wetlands, as opposed to this focus on one individual man-made wetland.

Generalizability

Generalizability refers to the how the findings of one study could be applied beyond the specific research objectives and situations of that study. As this study focuses on one particular constructed wetland with a myriad of unique characteristics, the application of these results beyond this situation is unwarranted. However, these results and study design may illuminate the general understanding of the phenomena discussed, and serve as an entry point for understanding other related situations.

CHAPTER 4 - RESULTS

Survey Results

This section presents the results from the survey conducted within the study area. The questionnaire consisted of both open-ended and categorical questions, and generally lasted between 10-20 minutes. There were an estimated 91 owner-occupied properties within 1000 feet of the center mass of the Tollgate system. Of these, a total of 30 questionnaires were completed for a response rate of 33%. A second round of surveying focused solely on homeowners whose property was situated on a 1500 feet radius of the center mass of the Tollgate system. Out of the estimated 36 owner-occupied properties, 16 households answered the survey for a response rate of 44% for those at the 1500 ft radius. The overall survey response rate was 36% (46 out of 127 possible respondents, see Table 2).

Table 16. Number of survey respondents, refusals and uncontacted households

	WITHIN 1000'	ON 1500' RADIUS	TOTAL
Households	91	36	127
# of Respondents	30	16	46
# of Refusals	31	6	37
# Uncontacted	30	14	44

The first set of results (Tables 3-5) includes all 46 survey respondents. These tables provide an overview of the perceptions of the survey respondents concerning general neighborhood characteristics and the Tollgate CW. On average, survey respondents had lived in their current residence 19.79 years (Table 3).

Residents were asked to identify characteristics that had initially influenced their decision to move into their current residence (Q.2). This was an open-ended question and

the results are presented in Table 2. The characteristic identified most often by the survey respondents was the "neighborhood" (32.6%), followed by "transportation / accessibility" (23.9%), the affordability of homes in the area (19.6%) and the convenient location of the neighborhood (17.4%).

When asked what they would now identify as the positive characteristics of this area (Q.4, open-ended), respondents indicated that the family or neighborhood orientation of the area (39.1%), as well as the relative quiet and safety of the neighborhood (41.3%) are important positive characteristics. The quality of home maintenance and the area's location were also identified as positive attributes. Surprisingly local schools were not deemed an important attractant or positive characteristic of the area. Most of the respondents indicated the Lansing School District had a poor reputation in comparison to other neighboring school districts. It is also interesting to note that while quiet and safety and being a family oriented neighborhood were not originally dominant characteristics in respondents' attraction to the area (Table 4), they had subsequently become the dominant positive characteristics of the area to these same respondents (Table 5).

Residents felt that the amount and speed of neighborhood traffic was the primary negative characteristic of the neighborhood (17.3%), although many (32%) felt that there were no negative neighborhood characteristics.

Table 17. Q1 - How long have you lived in this home?

N	RANGE	MINIMUM	MAXIMUM	MEDIAN	MEAN
46	54.9	0.1 years	55 years	13 years	19.79 years

Table 18. Q3 - What originally attracted you to live here?*

RESPONSES	COUNT	% RESPONDENTS
LOCATION	8	17.4
AFFORDABILITY	9	19.6
NEIGHBORHOOD	15	32.6
SALEABILITY	2	4.3
LOCAL SCHOOLS	3	6.5
TRANSPORTATION/ ACCESSIBILITY	11	23.9
FAMILY-NEIGHBORHOOD ORIENTED	3	6.5
QUIET/SAFE	5	10.9
LOCAL WETLAND	1**	2.2
ATTRIBUTES OF HOMES	11	23.9

* SALEABILITY refers to resale value, or the likely ease of reselling home.
* * This respondent has lived in his/her current residence for three years.

Table 19. Q4 - What do you now view as the positive characteristics of this area?

RESPONSES	COUNT	% RESPONDENTS
LOCATION	12	26.1
AFFORDABILITY	1	2.2
NEIGHBORHOOD	3	6.5
GOOD EXTERIOR MAINTENANCE	13	28.3
SALEABILITY	3	6.5
LOCAL SCHOOLS	2	4.3
TRANSPORTATION/ ACCESSIBILITY	8	17.4
FAMILY-NEIGHBORHOOD ORIENTED	18	39.1
QUIET/SAFE	19	41.3
LOCAL WETLAND	2	4.3
LOCAL PARKS	2	4.3
LOCAL GOLF COURSE	1	2.2
ATTRIBUTES OF HOMES	3	6.5

When asked to address specific neighborhood amenities which positively impact property values (Q.7, open-ended), residents most frequently answered 'the high level of exterior maintenance of neighborhood homes' (36.8%). The second most frequent answer to this question was the neighborhood or family orientation of residents (21.1%).

Most residents answered that the Tollgate CW was an overall positive for the neighborhood (76.2%) and the most frequently noted positive aspect of the CW was recreational access (58.1%). When prompted specifically to address the issue of the Tollgate's impact on property value, 48.8% reported they felt the Tollgate wetland increased the value of their property.

The following set of results compares the responses of respondents within 1000 feet of the Tollgate, with those that lie on the 1500 foot radius. This comparison of the two subsets of the population sampled is meant to test H3. Do residents on the 1500 foot radius view the Tollgate's property value impact differently than those within 1000 feet? First we will compare answers between the two sub-sets regarding the general neighborhood questions, then move to the questions specific to the Tollgate CW.

The average length of time respondents had lived at the property was 21.8 years for the population within 1000 feet, and 16.1 years for those that lived on the 1500 foot radius. In response to the open-ended Q.3, what originally attracted you to live here?; residents living within 1000 feet of the wetland most commonly identified 'attributes of the home' (33.3%) and 'the neighborhood' (30%), while residents on the 1500 foot radius answered 'the neighborhood' (43.8%) and 'location' (31.3%).

Table 6 compares on the basis of location the answers given to Q.4, which asked respondents to identify what they now view as the positive characteristics of their neighborhood. Of note, no respondents living 1500 feet from the wetland, regarded the local wetland as a positive characteristic of their area. However, this was an unprompted question. When asked if the wetland had been a plus or a minus for the area (Q.16), the

results across both groups are very similar with 78% of residents within 1000 feet and 71.4% of residents on the 1500 foot radius answering that the wetland was a 'plus'.

Table 20. Comparing Q4 - What do you now view as the positive characteristics of this area?

RESPONSES	% RESPONDENTS (W/IN 1000')	% RESPONDENTS (ON 1500')
LOCATION	23.3	31.3
GOOD EXTERIOR MAINTENANCE	26.7	31.3
TRANSPORTATION/ACCESSIBILITY	20	12.5
FAMILY-NEIGHBORHOOD ORIENTED	40	37.5
QUIET/SAFE	43.3	37.5
LOCAL WETLAND	6.7	0

The heart of this survey in regards to residents' perceptions of the property value impacts of the Tollgate CW, lies with questions 8d and 18f. In question 8 (a-h) respondents were asked whether or not they felt specific neighborhood attributes (e.g., presence of nearby schools, parks, the golf course, etc.) impacted the value of their property. Specifically, question 8d asked residents to indicate whether or not they felt the Tollgate Wetland impacted their property value, and if that impact was positive or negative. The results from each group are presented in Table 7, and Table 8.

From the beginning of the survey administration, the researcher noted that respondents seemed to be answering the question group Q8a-h, as whether or not they viewed the specific items mentioned (presence of nearby schools, parks, etc.) as a general positive or negative. In an attempt to correct this probable flaw in survey design, the researcher stressed Q18f, which asks a very similar question to Q8d. Question 18f was read to every respondent in the following manner, "As a possible advantage of a local wetland, do you feel that 'increased property value' applies to the Tollgate – Do you feel that the Tollgate increases the value of this property?" Tables 7 - 10 present the

responses to both Q8d and Q18f. In responding to both question 8d and question 18f, the majority of respondents living within 1000 feet of the wetland indicated that the wetland has a positive impact on property values. Comparing their responses to the two questions, 70% of these respondents indicated the wetland has a positive impact on property values in question 8d (Table 7) although this dropped to 58.6% when they were asked a similar question in 18f (Table 9). There was a corresponding 20% increase in respondents who viewed the Tollgate as having no impact on their property value.

Suggesting a proximity effect, 58.6% of the respondents within 1000 feet of the Tollgate believed it increases the value of their property (Table 9), while only 28.6% of respondents living on the 1500 foot radius feel the same way (Table 10).

Table 21. Within 1000 feet – Q8d. Indicate whether or not, 'the presence of the Tollgate Wetland' has had a positive, negative or no impact on the value of this property.

POSSIBLE RESPONSES	FREQUENCY	% RESPONSE
POSITIVE IMPACT	21	70
NEGATIVE IMPACT	3	10
NO IMPACT	5	16.7
I DO NOT KNOW	1	3.3

Table 22. On 1500 foot radius – Q8d. Indicate whether or not, 'the presence of the Tollgate Wetland' has had a positive, negative or no impact on the value of this property.

POSSIBLE RESPONSES	FREQUENCY	% RESPONSE
POSITIVE IMPACT	8	50
NEGATIVE IMPACT	2	12.5
NO IMPACT	6	37.5
I DO NOT KNOW	0	0

Table 23. Within 1000 feet - Q18f. As a possible advantage of a local wetland, do you think that 'increased property value' applies to the Tollgate?**

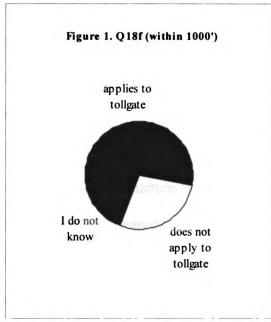
POSSIBLE RESPONSES	FREQUENCY	% RESPONSE
APPLIES TO TOLLGATE	17	58.6
DOES NOT APPLY TO TOLLGATE	8	27.6
I DO NOT KNOW	4	13.8

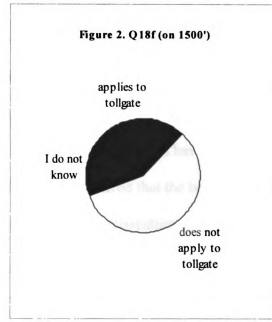
Table 24. On 1500 foot radius - Q18f. As a possible advantage of a local wetland, do you think that 'increased property value' applies to the Tollgate?**

POSSIBLE RESPONSES	FREQUENCY	% RESPONSE
APPLIES TO TOLLGATE	4	28.6
DOES NOT APPLY TO TOLLGATE	8	57.1
I DO NOT KNOW	2	14.3

** Some of the survey respondents did not answer this question.

Figures 1 and 2 present the data in Tables 9 and 10 as pie charts. Comparing the difference in responses between the two sub-sets of respondents, the pie-charts represent the percentage of respondents answering 'applies' (meaning the Tollgate increases the value of their property) or 'does not apply' (meaning the Tollgate does not increase the value of their property) to Q18f.





Residents of the neighborhood use the Tollgate for recreation (Q 21). Only 3.3% of respondents within 1000 feet and 18.8% of those on the 1500 foot radius indicated that they had never visited the wetland. Residents' primary recreational use of the wetland involves walking or jogging along the trails on the periphery of the CW. Of the 91% of respondents who indicated they visit the wetland, 90.5% replied that they used the walking trails. Sixty-five percent of all respondents felt that one advantage of the Tollgate was its functioning as a neighborhood meeting place.

Interview Results

The opinions of the real estate professionals (referred to as agents) interviewed for this research were fairly consistent in terms of identifying important characteristics of the Groesbeck neighborhood. The agents felt that the convenient location of the neighborhood meaning close to shopping, easy access to major thoroughfares and proximity to elementary schools was the most prominent driver of property values in the

neighborhood. The agents also identified excellent maintenance of homes and a sense of community as factors that draw potential homebuyers to the area. All of the agents felt that neighborhood property values were steadily increasing by 6-10%, a rate consistent with the general Lansing-area real estate market. The agents affirmed the good reputation of the neighborhood, and characterized the housing stock as having a wide range of style and structure. Five out of the six agents concurred that the boundaries of the neighborhood were correctly identified in the study. The dissenting agent, an appraiser who lives in the northern section of neighborhood, identified several smaller sub-neighborhoods contained with in Groesbeck. He felt that these neighborhoods, specifically those located around the Post-Oak elementary schools, were distinct from Groesbeck (See Appendix 3). These sub-neighborhoods were also defined in the data set provided by the City of Lansing.

When asked specifically about the Tollgate's impact on property values in the area, all of the agents agreed that in terms of aesthetic appeal and recreational access the CW does not impact property values in the area. However, the agents did reply that the Tollgate is a nice feature of the neighborhood and has an affect on the 'quality of life' in the area, even beyond the boundaries of the neighborhood. Three of the agents also indicated that when giving presentations to potential home buyers that they would include the Tollgate as a neighborhood attraction, and would probably do so for homes within 2 or 3 blocks from the wetland. One agent addressed an interesting facet of the Tollgate's impact on property values in terms of stormwater drainage. This neighborhood has historically been affected by groundwater intrusion into the basements of homes. This agent felt that in the long-term the drainage project (of which the construction of the

wetland to hold stormwater is a part), was increasing the value of homes in the neighborhood by lowering the probability of basement flooding, thus affecting the property value of the entire area.

While perhaps not influencing the actual sales price of homes in the neighborhood, the Tollgate's enhancement of the residents "quality of life" and the fact that it is lowering the probability of basement flooding clearly have the potential to impact the overall value of owning a home in Groesbeck. This suggests an indirect positive impact on residential property values in the area.

Hedonic Results

The following section begins with an explanation and summary of the variables incorporated into the hedonic model and is followed by a presentation of the results of the model and the summary statistics including the adjusted R^2 and the F value. The adjusted R^2 is the standard error of the estimate and is a measure of the variance of the predicted value of the dependent variable, which is sales price in this model. The F statistic is a measure testing the null hypothesis. The null hypothesis, H_o, states that none of the explanatory variables are predictors of the dependent variable. The higher the value of the F statistic, the more evidence against H_o.

Although the hedonic pricing method is an objective and revealed preference technique, the method requires analytical "fine-tuning" as there is no established technique for determining the number and type of variables to include in a model. As the focus of this research was not solely centered on the hedonic analysis, the researcher chose to use a simple model. Starting with a basic model including the variables in Table

11, the independent locational environmental variables where included in many combinations, while the dependent variable, Sales price, remained the same throughout the different specifications of the model. Table 12 provides the descriptive statistics for the variables included in the basic model, as well as the expected sign for each variable. Results from the survey and interviews were also taken into account when determining the inclusion of variables, but more importantly considered in the interpretation of the results.

Table 25. Variables in basic hedonic model

VARIABLES	EXPLANATION OF VARIABLE	N
FLR_AR	Total square footage of living space	269
TTL_AC	Total acreage of property	269
BATH	Number of bathrooms (including ½ baths)	269
YR98	Year of sale dummy variable = 1 if year = 1998; 0 otherwise	64
YR99	Year of sale dummy variable = 1 if year = 1999; 0 otherwise	60
YR00	Year of sale dummy variable = 1 if year = 2000; 0 otherwise	51
YR01	Year of sale dummy variable = 1 if year = 2001; 0 otherwise	54
YR02	Year of sale dummy variable = 1 if year = 2002; 0 otherwise	23

* 1997 is the omitted variable
** We expect the coefficient on the dummy variables in table 11 to be positive, and increase in value (i.e. 1998 should have lowest coefficient value, 2002 the highest)

Table 26. Descriptive statistics of variables

VARIABLES	SIGN	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	+	40909	194900	123778.25	24503.05
BATH	+	1.0	3.0	1.673	.431
TTL_AC	+	.133	.460	.21939	5.9106E-02
SAL_YR	NA	1997	2002	1999.48	1.42
FLR_AR	+	807	2960	1518.09	390.99

Running the OLS regression and including only the variables in Table 11, gave the expected results (Table 13). The positive sign indicates that a variable has a positive effect on the dependent variable, Sales price. For example the coefficient of 30.412 on the FLR_AR variable means that an increase of 1 square foot of living space gives rise to

an increase of $30.412 in the sale price. This model returns an adjusted $R^2 = .702$, and an F (8, 260) = 79.947.

Table 27. Results from basic hedonic OLS regression

VARIABLES	COEFFICIENT(B)	T	SIG.
(Constant)	20712.928	3.830	.000
BATH	10492.275	4.490	.000
TTL_AC	84266.516	5.387	.000
FLR_AR	32.084	11.486	.000
YR98	8430.148	2.308	.022
YR99	12351.703	3.342	.001
YR00	21476.978	5.700	.000
YR01	30847.895	8.259	.000
YR02	38542.724	8.944	.000

The next regression includes the locational variable DISTWET. This is a distance measurement in meters of each home sale to the nearest edge of the Tollgate wetland, as determined by the geographic information systems software, ArcView. According to the study hypothesis, H2, the expected coefficient for this variable would be negative. This means that as distance increases from the wetland, the sale price would go up. For example, if the coefficient from the hedonic regression is a –10.0, this would mean that for every meter we increase the distance from the wetland the sale price goes down 10 dollars. Table 11 presents the results from this regression. This model returns an adjusted $R^2 = .715$, and an F (9,259) = 75.835.

Table 28. Results from hedonic OLS regression with wetland locational variable

VARIABLES	COEFFICIENT(B)	T	SIG.
(Constant)	21425.767	4.050	.000
FLR_AR	31.724	3.325	.001
BATH	7946.457	4.556	.000
TTL_AC	71487.345	11.611	.000
YR98	8742.880		.015
YR99	13445.613		.000
YR00	22003.150		.000
YR01	30729.836		.000
YR02	40255.648		.000
DISTWET	8.866	3.623	.000

The results indicate that the variable DISTWET is significant and slightly positive. Therefore, according to this model, the proximity to the Tollgate has a slight negative impact on property values. Another model was created using the zonal approach, stratifying the study area based on a series of concentric circles, centered on the Tollgate each successively larger in 155 meter increments (Zone 1 radius = 155 meters, Zone 2 radius = 310 meters and so on). This approach yielded insignificant results. These unexpected results will be discussed in the following chapter.

CHAPTER 5 - CONCLUSIONS

This chapter discusses the results from each phase of the research including the residential survey, the expert in-depth interviews and the hedonic model. Major points of discussion will focus on not only where each agree, but also where they disagree. Results from this study will also be placed in the context of the published research presented in chapter 2. The researcher then proposes some explanations for why the results either diverge or converge. The chapter concludes with a discussion of the implications of the study findings for public policy and directions for future research.

From the results of the survey it is clear that the Tollgate CW is valued by the residents within 1500 feet of the system. This appreciation of the system most likely extends beyond the 1500 foot boundary used in this study. This conclusion is corroborated by at least three of the real estate agents interviewed, who felt that the recreational access to the CW improved the quality of life in the area. One agent who resides within a few blocks of the Tollgate stated that, based upon personal use of the walking trails, "...many of the recreational users come from outside of the neighborhood."

The survey respondents primarily derive value from the CW because the design of the system encourages recreation. Residents actively use the Tollgates walking trails, as can be seen in just one visit to the site. Without that, as one real estate agent put it, "...it would just be a hole in the ground, between the neighborhood and the golf course." Recreational use, although probably extending beyond the boundary of the study area, still exhibited a proximity effect. Survey respondents within 1000 feet replied that if there was a change in their attitude concerning the Tollgate (open-ended Q.14), 10% stated that their now positive attitude towards the project was attributable to recreational

access. None of the survey respondents on the 1500 foot radius felt the same way. Also suggestive of a proximity effect concerning recreation, 67% of respondents within 1000' answered that they visit the wetland at least once a week (open-ended Q. 21), while only 38% of those on the 1500' radius answered the same. These results, along with those presented in chapter 4 (Tables 7-10), indicate strong support for Hypothesis #3, although statistically significant correlations could not be made due to the small size of the sample.

Neighborhood residents view the Tollgate some what differently from other open space in the neighborhood. An assessment of the residents of the Groesbeck neighborhood was the sole funding mechanism for the entire drainage project. People value the other open space amenities in the neighborhood, such as the local park and golf course, but one gets a distinct feeling of interest when the wetland is mentioned. This feeling was certainly evident as the researcher went from house to house. This attitude was not always evidenced in a positive manner, as 23.3 % of respondents replied 'poor wetland maintenance' as a negative aspect of the Tollgate (Q.19, open-ended). However, out of those that answered Q.19, meaning they felt there was some negatives in having a local wetland, 85% felt that the wetland was still a 'plus' (Q. 16) overall.

The results of the survey clearly indicate that the respondents perceive the wetland as a valuable attribute to their neighborhood. However in relation to the other important neighborhood characteristics the Tollgate ranks fairly low. Question 9 of the survey asked respondents to indicate which of several items (including nearby schools, access to freeways, amount of local traffic, nearby parks and the Tollgate Wetland) has the greatest impact on the value of their property. Only 6.5% of all respondents answered

the Tollgate, most answered that the general location of the neighborhood had the greatest impact.

These findings are consistent with the literature reviewed in chapter 2. As with those surveyed in Mississauga, Columbia, Atlanta and Illinois (Debo 1977; Adams, Franklin et al. 1986; Emmerling-DiNovo 1996; Espey and Owusu-Edusei 2001), the respondents in this study believe that the wetland is valuable in that it impacts their property value, and provides recreational opportunities and wildlife habitat.

The results of the interviews with real estate experts were somewhat surprising. Initially it was believed that these interviews would determine the boundary of survey sampling. As all agents agreed that the appeal (aesthetic or otherwise) of the Tollgate would not significantly impact the asking price of any home in the area, regardless of proximity, the sampling boundary for the resident survey was determined by reviewing pertinent literature.

Real estate professionals familiar with the Groesbeck area do not feel that the CW directly affects property values. To that extent the agents' responses did not corroborate the majority of survey respondents' perceptions that the CW positively impacts their property value. However, similar to the residents, the real estate professional did highlight the value of the wetland to the neighborhood. This was reflected by the agents use of Tollgate in presentations for prospective buyers. This illustrates the important distinction between price and value. The real estate professional value the wetland as a neighborhood feature but do not believe it positively impacts on the sales price of a home in that neighborhood. In comparison, the residents believe that the wetland is a valued neighborhood features but is also a positive influence on home sale price. By influencing

the quality of life in the neighborhood, it is the researchers perception that the agents are indicating an increase in the overall value of living in a neighborhood with a CW designed with recreational amenities. This value, much like the neighborhood-wide effect on drainage, could indirectly affect neighborhood-wide property prices. One example might be that by strengthening the sense of community, which both agents and survey respondents agreed was a property value driver in Groesbeck, the Tollgate is positively impacting property values.

The results of the hedonic analysis, while not providing support for hypothesis #1 or #2 that the Tollgate has a positive impact on proximate property value, do shed some light on the market conditions in the neighborhood.

Running several different regression models with a stepwise inclusion of the other open space locational variables, it is the researcher's perception that the open space amenities (i.e. the local elementary school, the Tollgate) in the neighborhood have little effect on the dependent variable (i.e. sales price of homes). Instead, recalling the one agent's perception of the sub-neighborhoods contained within Groesbeck, it appears that it is the sub-neighborhoods that influence both the locational coefficients and the dependent variable. When including dummy variables for the sub-neighborhood and the distance to the Tollgate in the hedonic model, these variables are shown to be influential. This model yields an adjusted $R^2 = .754$, and $F(16,252) = 48.217$.

Table 15. Hedonic OLS regression with sub-neighborhood designations

VARIABLES	COEFFICIENT(B)	T	SIG.
(Constant)	30681.851	5.463	.000
YR98	7686.295		.027
YR99	12454.131		.000
YR00	21859.316		.000
YR01	28910.228		.000
YR02	39675.519		.000
FLR_AR	29.625	10.612	.000
BATH	6585.144	2.666	.008
TTL_AC	44102.208	2.641	.009
TOWN2	1889.426		.445
CITY1	11455.922		.006
CITY2	6674.049		.149
CITY3	12226.320		.000
CITY4	14459.726		.002
CITY5	23613.857		.004
CITY6	8728.308		.232
DISTWET	4.178	.946	.345

a Dependent Variable: SAL_PRI
b TOWN1 was the omitted variable (this geographic designation contains the Tollgate CW)

However the inclusion of these neighborhood dummy variables creates problems with the significance of the DISTWET variable. This could be the result of too many variables in the model compared to the relatively small data set.

Analysis of the correlation between sales price and these designations indicates a statistically significant and fairly strong relationship (Table 16). There is also a strong relationship between the sub-neighborhoods and the DISTWET variable (Table 17). This was expected due to the position of the wetland within the study area (see Appendix 3).

Table 16. Correlation between sales price and sub-neighborhoods

		TOWN 1	TOWN 2	CITY1	CITY2	CITY3	CITY4	CITY5	CITY6
SAL_PRI	Pearson Correlation	-.329	-.258	.292	-.043	.166	.277	.138	.040
	Sig. (2-tailed)	.000	.000	.000	.487	.006	.000	.024	.510

Table 17. Correlation between distance to the wetland and sub-neighborhoods

		TOWN 1	TOWN 2	CITY1	CITY2	CITY3	CITY4	CITY5	CITY6
DISTWET	Pearson Correlation	-.504	-.303	.376	.493	-.209	.197	.086	.282
	Sig. (2-tailed)	.000	.000	.000	.000	.001	.001	.159	.000

The significance of these results relates to the position of the sub-neighborhoods within the city portion of the Groesbeck neighborhood. The Tollgate is contained within township sub-neighborhood # 1 (TOWN 1), which is the southernmost sub-neighborhood (see Appendix 3). TOWN2 is located in the heart of the neighborhood, and the city sub-neighborhoods are primarily located in the northern half of the neighborhood. The northern orientation (versus the southern location of the Tollgate) of these more "affluent" sub-neighborhoods is what could be influencing the hedonic model, as opposed to the distance to any of the open spaces in Groesbeck.

The proximity to downtown Lansing was one factor the agents mentioned as an attraction to potential homebuyers, especially city employees who face monetary penalties if they do not live within the city limits. Thus city employees who value the easy access to their place of employment provided by the neighborhood, would most likely prefer to live in the northern city portion of Groesbeck. This demand is reflected in the hedonic model when a dummy variable is inserted that indicates whether or not the home sale took place in the Township (TSHIP = 1, if the home is in Lansing Township, 0 otherwise). The price of a home is almost $10,000 less, all else equal, if it is situated in the township versus the city (see Appendix 4).

Another possibility for the seemingly negative effect of proximity to the Tollgate could be the relatively large volume of traffic in that area of the neighborhood. The

closest intersection to the Tollgate, Saginaw and Wood St., is a source of heavy traffic. Confirmed by the real estate agent interviews and survey respondents, most of any through traffic the neighborhood experiences flows through this intersection. This traffic could be the cause of the slight, negative depression of property values in this corner of Groesbeck.

One more feasible explanation could be the relatively larger percentage of rentals in Town 1 (which contains the Tollgate). A large apartment complex is directly across the road from the CW. Although none of the agents interviewed felt that this was an issue with the neighborhood, anecdotally most of the survey respondents who felt that poor exterior maintenance of neighborhood homes (19.6%) was a negative characteristic of the neighborhood affecting property values (open-ended Q.7), believed that the poor maintenance was related to amount of rental properties in the area.

The results of each phase of this research provide a confusing image of the property value impacts of the Tollgate Wetland. Real estate professionals believe the wetland has no direct effect, disagreeing with a majority of the survey respondents but receiving support from the hedonic analysis. Clearly there is no definitive answer, but there is a potential scenario that could provide and explanation for these inconsistent results.

There may be a significant time lag between resident's perception and actual property impacts. Clearly if people are drawn to the wetland, as indicated by two survey respondents replying that the wetland had an effect on the purchase of their home (Q. 12), and realtors believe it enhances the quality of life, the Tollgate has the potential to impact property values. As we are dealing with a relatively short time span, the five years since

the construction of the CW, it is possible that the impact of the Tollgate is not yet reflected by the hedonic analysis. As the number of home sales impacted by residents and realtors perceptions grows, the more significant and prominent the Tollgate's property value impact may become. Though this would not provide support for H2, it would lend evidence to support H1, that the Tollgate is having a positive effect on the value of property in the Groesbeck neighborhood.

Future Directions for Research

In terms of directions for future CW valuation, this study has provided some insight into study design and considerations. Certainly the idea of a time lag lends itself to a follow up study. Although the data gathered for this study was time consuming, it was relatively inexpensive and readily available. A more focused mail survey would cut down on time necessary to gather residential perceptions and a randomized sample over a much larger area could explore the range of the social impact of a properly designed CW. Hedonic analysis, once the transactions are screened for bias and the data is filtered, is not a time intensive process when using the correct software. It would also seem highly likely that in the future more of this data will be digitized and available on-line. Therefore a follow up study could be relatively easy and inexpensive to conduct, shedding light on the longer-term social impacts of constructed wetlands like the Tollgate.

In the short-term, and specific to the Tollgate, it would be interesting to explore the idea that the CW is moderating the effect of the "pull" of the northern sub-neighborhoods in Groesbeck. Comparing data before and after the Tollgate's

construction could reveal the fact that the CW has restrained the depression of property values in that area.

Policy Implications

The results of the hedonic analysis indicate that the Tollgate is not a significant influence of sale price in the neighborhood. However, as shown by the survey and expert interviews there is little doubt that people in this area value the wetland. This is especially important considering the neighborhood contains a relatively large amount of open-space amenities including the wetland, a local park, school and golf course. In addition, the wetland may indirectly have a positive impact on property values as a result of its value as a neighborhood asset and its function as a stormwater control. The results of this study show that even in neighborhood with open-space amenities, the construction of a stormwater system like the Tollgate would be valued by neighborhood residents. This scenario would likely prove even more beneficial in a area lacking such amenities.

The residents of Groesbeck saved an estimated 14 million dollars (Lindemann and Wayland 1999) by eschewing the traditional "end of pipe" stormwater management, and gained a valuable neighborhood asset. By treating stormwater, providing wildlife habitat and providing a place for neighbors to walk, congregate and view wild creatures and plants, the Tollgate's true impact reaches far beyond its boundaries. As shown by this research, this view is shared by it's neighbors, and all those familiar with the wetland.

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Appendix 1.

Interview Guide for Real Estate Professionals

Interview Guide:

Could you provide me with a brief background regarding your real estate experience in the Lansing area?

- Years of experience
- Familiarity with Tollgate area

Tollgate Drainage District

- What are the biggest drivers of property value in this area?
- What are the important neighborhood characteristics that are found in this area?
- How much does each of those characteristics effect the price of property in this neighborhood?
- Does the Tollgate Wetland have an effect on property value in that neighborhood?
- What is the areal extent of that effect?
- How much of an effect, dollar value?
- **Do you use the Tollgate Wetland as a selling feature to prospective homebuyers, in advertisements**? If so how far away would you use them?
- Does the golf course overshadow the Tollgate Wetland as a property value driver?
- Could you separate the effect of the wetland from the golf course?
- Without the golf course, would the Tollgate Wetland have the same effect?
- If you moved the Tollgate Wetland to different parts of town, would it have the same effect in each?
- What are the features of the wetland that could really effect property value?
- Could you suggest a control area that is similar to the Tollgate neighborhood prior to the construction of the wetland?

Are there any issues that I missed, or we didn't cover?

Appendix 2.

Resident Survey

1. How long have you lived in this house? _____ years

2. Does your household rent or own this house?

   ☐ a. Rent

   ☐ b. Own

   ☐ c. Don't know

3. What originally attracted you to live here?

4. As a neighborhood, what do you now view as the positive characteristics of this area? [Let respondent determine "area"]

5. As a neighborhood, what do you now view as the negative characteristics of this area? [Let respondent determine "area"]

6. Are there things about this neighborhood that you believe either increase or decrease the value of the house that you live in?

   ☐ a. Yes

   ☐ b. No

   ☐ c. I don't know

7. If yes, what are they and how do they impact your property value?

8. As I read each of the following items, I would like you to indicate whether or not, in your opinion, the item has had a positive, negative, or no impact on the value of this property.

ITEM	Positive	Negative	No impact	Don't know
The presence of nearby schools				
The presence of Groesbeck Golf Course				
The presence of nearby parks				
The presence of the Tollgate Wetland				
Distance to work				
The amount of local traffic				
Local Development (New Mall)				
Access to freeways				

9. Which of these items has had the greatest positive impact on the value of this property? [If respondent lists more than one ask to rank]

10. Over the past five years do you believe that the residential property values in this area have gone up, down or stayed the same?

- ☐ a. Up
- ☐ b. Down
- ☐ c. Stayed the same
- ☐ d. Don't know

11. Are you familiar with the Tollgate Wetland? [If no skip to question 23]

- ☐ a. Yes
- ☐ b. No
- ☐ c. I don't know

12. Did the proximity of this home to the Tollgate Wetland have an influence on your purchase of a home in this area?

13. [If the respondent did not answer >5 in question #1, skip to #15] I notice that you have lived here during the time when the construction of the Tollgate Wetland was being considered. When you think back to that time, what was your attitude toward the Tollgate Project when it was first proposed?

- ☐ a. Positive
- ☐ b. Neutral
- ☐ c. Negative
- ☐ d. I didn't know about it

14. If you feel differently about the Tollgate Wetland now, please explain what caused the change. ☐ No change in opinion/attitude.

15. Do you know if the Tollgate Wetland is a natural or constructed (i.e. man-made) wetland?

- ☐ a. Natural
- ☐ b. Constructed
- ☐ c. I don't know

16. Overall, do you think that the wetland has been a plus or a minus for this area?

- ☐ a. Plus
- ☐ b. Minus
- ☐ c. Neutral

17. In your opinion, what if any are the positive aspects of having the Tollgate Wetland in this area?

18. I am going to read out a list of possible advantages of having a local wetland and I would like you to indicate for each item whether or not, in your opinion, it applies to the Tollgate wetland.

ADVANTAGE	Applies	Does not Apply	Don't know
Access to walking trails			
Bird watching			
Increased aesthetics (ie. scenic value)			
Wildlife habitat			
Stormwater treatment			
Increased property value			
Place to meet with neighbors			
Open space			
Other:			

19. In your opinion, what if any are the negative aspects of having the Tollgate Wetland in this area?

20. I am going to read out a list of possible disadvantages of having a local wetland and I would like you to indicate for each item whether or not, in your opinion, it applies to the Tollgate wetland.

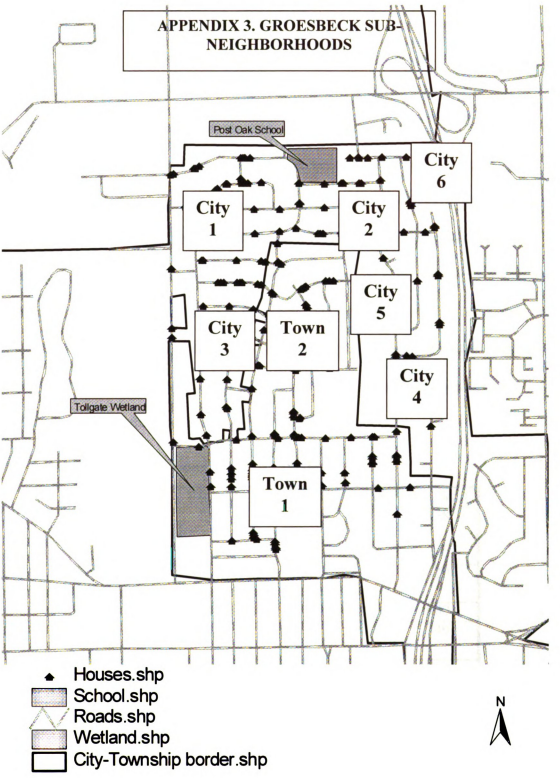
DISADVANTAGE	Applies	Does not Apply	Don't know
Increased taxes			
Child safety			
Nuisance animals			
Nuisance people			
Increased traffic			
Basement flooding			
Noise			
Other:			

21. How often do you visit the Tollgate Wetland?

22. If you do visit the Tollgate Wetland what kind of activities do you do there? (next page for expected possible answers)

- ☐ a. Bird
- ☐ b. Jog or walk
- ☐ c. Visit with neighbors
- ☐ d. Picnic
- ☐ e. Visit with family
- ☐ f. Enjoy the view
- ☐ g. Sporting events
- ☐ h. Other _____

23. That is all the questions that I have. Are there any additional comments you would like to make?


APPENDIX 3. GROESBECK SUB-NEIGHBORHOODS
Post Oak School
City 6
City 1
City 2
City 5
City 3
Town 2
City 4
Tollgate Wetland
Town 1
Houses.shp
School.shp
Roads.shp
Wetland.shp
City-Township border.shp
N

Appendix 4

Additional Statistics

This appendix provides more statistical information regarding the study, with a particular focus on the hedonic analysis used to determine property value impacts. The first table provide simple correlations between the variables used in the basic model. Tables 2-10 provides data for the homes sold within each sub-neighborhood designation, and highlight the average difference in features of the homes located in the township versus the city. Three additional hedonic models are also included, each with a different specification. Lastly, tables comparing the attributes of homes in the city and township preface an independent t-test of the means of township sales versus city sales. This test indicates that the attributes (and sales price) of the homes within the township are significantly different than the homes within the city.

Table A4-1. Simple correlations between variables

		TTL_AC	BATH	FLR_AR	DISTWET
TTL_AC	Pearson Correlation	1.000	.249	.459	.338
	Sig. (2-tailed)	.	.000	.000	.000
BATH	Pearson Correlation	.249	1.000	.573	.420
	Sig. (2-tailed)	.000	.	.000	.000
FLR_AR	Pearson Correlation	.459	.573	1.000	.349
	Sig. (2-tailed)	.000	.000	.	.000
DISTWET	Pearson Correlation	.338	.420	.349	1.000
	Sig. (2-tailed)	.000	.000	.000	.

Table A4-2. Town 1

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	57	40909	180000	108280.81	25966.14
FLR_AR	57	807	2960	1317.05	464.39
BATH	57	1.0	3.0	1.368	.448
YR_BLT	57	1950	1965	1956.12	4.07
DISTWET	57	2.669	869.364	347.99956	242.82801
N	57				

Table A4-3. Town 2

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	65	75000	162000	112601.42	21856.31
FLR_AR	65	962	2274	1386.97	374.98
BATH	65	1.0	2.5	1.623	.375
YR_BLT	65	1951	1965	1959.15	3.64
DISTWET	65	.000	860.747	512.88931	213.95706
N	65				

Table A4-4. City 1

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	46	103000	189000	139497.83	17324.46
FLR_AR	46	1220	2384	1720.93	298.04
BATH	46	1.5	2.5	2.022	.394
YR_BLT	46	1964	1979	1970.46	4.38
DISTWET	46	848.508	1172.539	1030.39565	94.16317
N	46				

Table A4-5. City 2

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	35	90000	148400	121088.57	15377.37
FLR_AR	35	999	1802	1427.57	193.63
BATH	35	1.0	2.5	1.614	.299
YR_BLT	35	1964	1979	1966.23	4.03
DISTWET	35	980.069	1385.185	1200.07086	116.94422
N	35				

Table A4-6. City 3

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	38	88050	159000	133790.79	15272.04
FLR_AR	38	1038	2148	1677.68	222.57
BATH	38	1.0	2.5	1.724	.323
YR_BLT	38	1964	1984	1967.71	3.49
DISTWET	38	41.173	781.155	521.67892	231.20672
N	38				

Table A4-7. City 4

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	19	108000	194900	148310.53	22113.07
FLR_AR	19	1312	2953	1854.21	403.02
BATH	19	1.5	2.0	1.711	.254
YR_BLT	19	1963	1971	1965.68	1.95
DISTWET	19	833.073	1214.752	987.22642	125.31663
N	19				

Table A4-8. City 5

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	3	147500	164000	155466.67	8264.58
FLR_AR	3	1686	2064	1899.67	193.77
BATH	3	2.0	2.5	2.167	.289
YR_BLT	3	1973	1975	1974.33	1.15
DISTWET	3	996.007	1074.146	1024.09400	43.45425
N	3				

Table A4-9. City 6

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	6	105000	149500	130316.67	17435.07
FLR_AR	6	1224	2191	1555.33	354.84
BATH	6	1.5	2.5	2.083	.492
YR_BLT	6	1983	1990	1986.67	2.94
DISTWET	6	1319.491	1494.314	1425.89733	83.38206
N	6				

Table A4-10. Stats for complete data set

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	269	40909	194900	123778.25	24503.05
FLR_AR	269	807	2960	1518.09	390.99
BATH	269	1.0	3.0	1.673	.431
YR_BLT	269	1950	1990	1963.82	7.45
DISTWET	269	.000	1494.314	716.66627	379.92940
N	269				

Basic hedonic model using zonal approach to measure proximity effects to Tollgate.

Model Summary

	R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE
	.855	.723	.713	13119.58

a Predictors: (Constant), DIST10, YR01, DIST9, TTL_AC, DIST1, DIST3, YR02,

DIST4, DIST8, YR00, DIST6, DIST5, FLR_AR, YR99, DIST2, YR98, BATH

ANOVA

		SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
	Regression	1.18 E+11	17	6923770010.08	40.226	.000
	Residual	44562032155.873	252	172123451.8502		
	Total	160907076585.807	268			

a Predictors: (Constant), DIST10, YR01, DIST9, TTL_AC, DIST7, DIST3, YR02,

DIST4, DIST8, YR00, DIST6, DIST5, FLR_AR, YR99, DIST2, YR98, BATH

Coefficients

		UNSTANDARDIZED COEFFICIENTS		T_b	SIG.
		B	Std. Error		
	(Constant)	33939.01	7309.175	4.643	.000
	YR98	8507.614	3607.341		.022
	YR99	12950.137	3735.130		.001
	YR00	20986.312	3801.066		.000
	YR01	29913.286	3763.322		.000
	YR02	39876.374	4366.454		.000
	FLR_AR	34.420	2.577	13.355	.000
	TTL_AC	50683.869	17039.110	2.975	.003
	DIST2	-7346.424	3475.127		.086
	DIST3	-4480.448	3559.638		.312
	DIST4	-2924.749	3507.803		.514
	DIST5	1202.671	3083.627		.772
	DIST6	3020.056	4484.840		.501
	DIST7	5259.955	4194.575		.211
	DIST8	4638.571	4255.705		.277
	DIST9	2720.551	5099.882		.594
	DIST10	5783.136	7706.960		.454

a Dependent Variable: SAL_PRI, DIST1 is the omitted variable
b T values are not reported for dummy variables

Basic hedonic model with natural log transformation of DISTWET variable.

Model Summary

	R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE
	.851	.724	.714	13114.98

a Predictors: (Constant), LN_DWET, YR00, YR02, TTL_AC, YR01, FLR_AR, YR99, YR98, BATH

ANOVA

		SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
	Regression	116337066160.57	9	14198068940.309	75.152	.000
	Residual	44376686053.18	259	181966025.835		
	Total	160713752213.76	267			

a Predictors: (Constant), LN_DWET, YR00, YR02, TTL_AC, YR01, FLR_AR, YR99, YR98, BATH

b Dependent Variable: SAL_PRI

Coefficients

		UNSTANDARDIZED COEFFICIENTS		T_b	SIG.
		B	Std. Error		
	(Constant)	7965.09	7318.59	1.08	.270
	YR98	8741.20	3583.83		.015
	YR99	13654.37	3643.70		.000
	YR00	21941.78	3698.61		.000
	YR01	31008.99	3663.21		.000
	YR02	39630.20	4246.90		.000
	FLR_AR	32.22	2.75	11.69	.000
	BATH	9351.08	2337.57	4.00	.000
	TTL_AC	79237.97	15478.30	5.11	.000
	LN_DWET	2380.73	1007.50	2.36	.019

a Dependent Variable: SAL_PRI

b T values are not reported for dummy variables

Basic hedonic model including DISTWET and TSHIP (a dummy township variable, 1 if home sales took place within Lansing Township, 0 otherwise meaning within City)

Model Summary

	R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE
	.862	.742	.732	12673.3

a Predictors: (Constant), DISTWET, YR00, YR02, YR01, TTL_AC, FLR_AR, YR99, TSHIP, YR98, BATH

ANOVA

		SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
	Regression	119469064948.52	10	11946906494.85	74.38	.000
	Residual	41438011637.28	258	160612448.20		
	Total	160907076585.80	268			

a Predictors: (Constant), DISTWET, YR00, YR02, YR01, TTL_AC, FLR_AR, YR99,

TSHIP, YR98, BATH

b Dependent Variable: SAL_PRI

Coefficients

		UNSTANDARDIZED COEFFICIENTS		T_b	SIG.
		B	Std. Error		
	(Constant)	36692.08	6288.65	5.83	.000
	YR98	8375.887	3526.266		.018
	YR99	13074.039	3578.598		.000
	YR00	21689.937	3633.008		.000
	YR01	29011.636	3598.226		.000
	YR02	39898.324	4180.637		.000
	FLR_AR	30.84	2.657	11.61	.000
	BATH	7542.49	2318.829	3.25	.001
	TTL_AC	52296.71	15885.352	3.29	.001
	TSHIP	-9404.12	2242.115		.000
	DISTWET	2.36	2.834	.83	.404

a Dependent Variable: SAL_PRI

b T values are not reported for dummy variables

Table A4-11. Stats for homes within the Township

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	121	40909	180000	110588.41	23961.18
FLR_AR	121	807	2960	1348.07	414.83
BATH	121	1.0	3.0	1.500	.428
TTL_AC	121	.133	.422	.18864	5.6394E-02
YR_BLT	121	1950	1965	1957.68	4.08
N	121				

Table A4-12. Stats for homes within the City

VARIABLES	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
SAL_PRI	148	88050	194900	134561.82	19121.81
FLR_AR	148	999	2953	1657.09	308.19
BATH	148	1.0	2.5	1.814	.379
TTL_AC	148	.170	.460	.24453	4.8562E-02
YR_BLT	148	1963	1990	1968.84	5.59
N	148				

INDEPENDENT SAMPLES T-TEST: GROUPING VARIABLE IS TSHIP (A DUMMY TOWNSHIP VARIABLE, 1 IF HOME SALES TOOK PLACE WITHIN LANSING TOWNSHIP, 0 OTHERWISE MEANING WITHIN CITY)

Group Statistics

	TSHIP	N	MEAN	STD. DEVIATION	STD. ERROR MEAN
SAL_PRI	0	148	134561.82	19121.81	1571.80
	1	121	110588.41	23961.18	2178.29
FLR_AR	0	148	1657.09	308.19	25.33
	1	121	1348.07	414.83	37.71
TTL_AC	0	148	.24453	4.8562E-02	3.9918E-03
	1	121	.18864	5.6394E-02	5.1267E-03
BATH	0	148	1.814	.379	3.117E-02
	1	121	1.500	.428	3.892E-02
SAL_YR	0	148	1999.40	1.44	.12
	1	121	1999.59	1.41	.13

Independent Samples Test T-TEST FOR EQUALITY OF MEANS

		t	df	Sig. (2-tailed)	Mean Diff	Std. Error Diff	95% Confidence Interval of the Diff	
							Lower	Upper
SAL_PRI	Equal variances assumed	9.127	267	.000	23973.41	2626.78	18801.57	29145.25
	Equal variances not assumed	8.925	227.210	.000	23973.41	2686.17	18680.42	29266.40
FLR_AR	Equal variances assumed	7.003	267	.000	309.03	44.13	222.15	395.91
	Equal variances not assumed	6.802	216.711	.000	309.03	45.43	219.49	398.57
TTL_AC	Equal variances assumed	8.731	267	.000	5.5891E-02	6.4011E-03	4.3288E-02	6.8494E-02
	Equal variances not assumed	8.602	238.152	.000	5.5891E-02	6.4975E-03	4.3091E-02	6.8691E-02
BATH	Equal variances assumed	6.378	267	.000	.314	4.926E-02	.217	.411
	Equal variances not assumed	6.300	242.015	.000	.314	4.987E-02	.216	.412

SAL_YR was not significant

The results of this test indicate that there is a significant difference in these attributes of homes, comparing the Township versus the City portions of the neighborhood. However, when we incorporate the TSHIP dummy variable into the

hedonic model the significance of the DISTWET variable becomes insignificant (see above model). This could be an indication that other characteristics of the township section are influencing price depression, for example the high number of rental property or heavy traffic (as discussed in Chapter 5), and not proximity to the Tollgate.

Appendix 5

Transcribed Interviews with Real Estate Agents

INTERVIEW 1: 07/23/02,1400 HOURS WITH AGENT 1 AT BRIARWOOD REALTY.

Q: How many years of experience do you have in the Lansing area ? 22 years

Q: How long have you been familiar with the Groesbeck area? 22 years

Q: What are some of the biggest factors that people consider in this neighborhood when purchasing a home?

Q: If you had to pick two of the important characteristics that people consider when buying a home in this area what would they be?

Q: What would say about the Tollgate Wetlands...How does it affect the value of property and the quality of life in this area?

A: The quality of life. One of the things that I tell people.

Q: Putting a value like five thousand dollars for some of these houses that are really close to it. Would you put a dollar figure like that on it.

A: If you are talking about enhancing the quality of life you could put a figure like a million dollars on it. Hard to put a dollar value on it.

Q: Could it influence how long your house could be on the market?

A: Could influence how long people stay in the neighborhood. Sometimes people move into a neighborhood and there is no focal point where people can really meet each other. And they take walks in the neighborhood so they are out amongst their neighbors. People don't stay as long in the neighborhood. They transfer more readily. So I think with a place like the wetlands where people are walking ,people are less inclined to sell quite as fast. Because they have made friends with their neighbors and there is a focal point-a place where they can meet and congregate, where they can gather.

Q: You know that's cool because I'm doing a residential survey of the people here and that's one of the things that my advisor thought of to throw in the idea of community, the wetlands as a place of community gathering. And if that's valuable to people or not?

A: I think very valuable and I think the closer you are to Groesbeck and the Eastside neighborhoods to that the more you'll be able to sell.

Q: Well we had mentioned before that you liked to drive by the Wetlands when you have prospective home buyers for people in this area. Do you know, do other real estate agents do the same thing? And is there-I mean, when you are listing a house would you ever list a house as having proximity to the Tollgate Wetlands?

A: Absolutely. I mean it's a selling feature. It doesn't, I don't feel, it affects the particular value of the house. I think people are looking for value in the house, a particular size of the house, a particular number of bedrooms, number of bathrooms. You can't do any of those things with the wetland. But it provides you with an enhancement for the neighborhood. So when I'm showing prospective buyers from other places I mention it. In fact, right across from the wetlands, kitty-corner, I sold a home to a family from Montana And the first thing I did was said "let's take a walk through the wetlands" to show them this focal point of the neighborhood and they ended up buying the home. Right kitty corner from the wetlands that was available. So I use it as a selling feature and in listings I use it as an advertising feature. It increases the sense of community.

Q: Do you think the proximity of this neighborhood to the golf course would overshadow the proximity of the neighborhood to the wetland as a property driver?

A: No The road between the housing and the golf course. It separates the golf course from the neighborhood. If the golf course were more incorporated into the neighborhood that would be a different story. In fact, it is a major thoroughfare and it is even going to be worse because a major shopping center is going in .It has little or no impact.

Q: Without the golf course, do you think the wetland would have the same affect? I guess you have answered that.

Q: If you could plop Tollgate down in another neighborhood would it have the same affect?

A: My question is why would you do that? Why not just create a wetland in every neighborhood. I think it would have the same effect.

Q: Do you think that there are some features of this constructed wetland design that you feel could have an effect on property values?

A: Trails. Benches. Labels around the wetlands pointing to certain species of bushes and trees and wildlife. Those types of things are things that people find really nice. Again, it's an enhancement.

Q: Because you can use it. So it's just really pretty. People just like to look at it.

A: If it did not have trails and benches I think it would be worthless. I don't think a soul would care that it was there. But the fact that it has provided walking space for people has made all the difference.

Q: OK. I am thinking about taking this neighborhood and comparing it to another neighborhood that would be very similar (census block data, average price of home,) and compare this neighborhood to another comparable neighborhood and get a trend for the prices. Are houses selling for more near the Tollgate versus another neighborhood? I just wondered what you'd think about those two approaches and I was wondering if you could suggest a comparable neighborhood.

A: I was going to say. It's a wonderful idea. We don't have another neighborhood inside the city of Lansing like Groesbeck. We are not a large enough city that you could find one-you'd have to take into consideration all the other factors about Groesbeck. The fact that Groesbeck borders East Lansing. That it is near the campus and the stadiums. That it is near Frandor Shopping Center and now another big shopping center. All those factors are influential so it would be hard to pull out just one variable and say that it made a big difference.

Q: OK

A: If we had another neighborhood, that would be similar to it....Which we don't. I'd have to think about it but I am fairly certain that we don't. Not comparable to Groesbeck.

Q: OK Well I think that's all the questions that I had. Is there anything that you can thing of that we have missed. Any topic or an issue.

A: I can't think of anything.

Q: Basically in your mind. My thought was I was going to have everybody I talked to draw a circle and say "within this circle there is a price impact" but you don't think it does?

A: Again I don't think it's a price issue but a quality of life one. Again, that's a priceless factor. This wetland has an impact all the way to Michigan Avenue. Because people on the E. Side south of Saginaw and Oakland often walk and ride their bikes up there and they wouldn't do that if they didn't have a destination and they didn't have trails. So it is impacting way outside of Groesbeck. Everything, all the housing that is connected is impacted by it.

Notes from interview - Minor difficulty with the tape in the beginning. I tried to run over ground that we may have missed in that initial part. Agent 1 feels like there is not a set amount of money that you could place on the value of proximity to Tollgate But it is a selling point. I should probably re-contact him and ask him a good way to get to the listings and see how he advertises it. Seemed very knowledgeable. Somewhat hesitant. He didn't really seem to understand how his insight would be valuable but I really believe it was. One more thing I wanted to add, Agent 1 had mentioned that he lived on Magnolia St. on the other side of Saginaw and Grand River. Part of his idea is that the Tollgate has a more diversified affect than just specifically in the Groesbeck area. Not as specific as you might think. Not an influence on the actual selling price of the house in

the immediate area. Certainly has a more wider ranging effect on houses beyond that area. More so than I had thought before talking to him.

From: Agent 1
Sent: Thursday, August 08, 2002 10:05 PM
To: clineeri@msu.edu
Subject: Re: Would you use the Tollgate in a listing for a home, and how far away?

i would use it and the next one i use it in i will make sure you get a copy. keep watching the papers and homes and lifestyles for other agents using the ads. 1/2 mile

INTERVIEW 2: 07/30/02, 1000HRS WITH AGENT 2 OF TOMMY RAINES REALTY

Q: You were saying that you don't think the Tollgate Wetland was a....

A: I don't think that it is a positive or a negative. I've had a few people say they wish it was kept up a little better. (the Tollgate) But The people that I've talked to recently a lot of them walk their kids around that area. They jog around that area.

We lived just south of there on Francis and I know that I would run thru Groesbeck, that was one of the areas that we made a point of going thru, after it was developed.

I sold a house on Woodruff and they liked having it there, they would walk their walk their dog around there. It was a big plus for them.

When you talk about the Groesbeck area-are you from around here?

[interviewer: Yes I grew up in Springport. South of here. South of Lansing.]

Oh I do a lot of business around here. I'm born and raised in Lansing. The south side. A lot of my friends are from the East side. I do a lot of business over here because a lot of my friends are moving back into the area. One of the big reasons that people move to Groesbeck is that their families are still there. Their parents are still there, and their friends are moving back there to raise their families. This is a bonus (the Tollgate), but it is not necessarily a draw to Groesbeck though. I think people like the aesthetic value of it and it (The Tollgate Project) took a piece of property that probably wasn't very useful and made a positive aspect out of it, as well as making it aesthetically valuable. But as far as property values. I don't think it really hurt or helped it in either way.

Q: Some people have negative perceptions of that area...there are mosquitoes. There could be nuisance people. I'm sure there a lot more people going to that area.

A: Our township patrols that area really heavily and I think that that is what's so pleasing. You can walk down there any time of day. You can see older couples walking or sitting on benches in the evening. I had one client- she sold her house-it was on Groesbeck. She

would walk over there, around the wetlands so many times, and that was her daily exercise. It gives them a nice place to go. Someplace besides just walking around her neighborhood.

Q: Your background in real estate.

A: I've been the business for 12 years, but I have two small children so it has really been closer to 5 years – mostly since they started school. I am really loyal to Groesbeck. Born and raised in the area. Our first house. We tried to get in there. We tried to buy three different houses there and ended up losing them. WE bought on Francis just South. I have a really strong tie with the neighborhood. I have a place in my heart for that neighborhood. And a lot of my friends live over there, and like I said their parents still live there. The house I sold last year in Groesbeck-she'd been there since the sixties and she just sold it. Across the street one of the people that I get a lot of leads from, raised her family in that house and now she has three daughters and her husband all live in that neighborhood. So it just pulls the Jacobs family there. My tie to Groesbeck is longer term and more personal.

Q: What are the biggest drivers of property values in the area?

A: Lot of my friends who live there-they went to Resurrection then Catholic Central, and now a lot of their kids are going to Catholic Central. Larry Meyers, he is on the city council, (don't quote me on this but I believe) he moved from Okemos to Groesbeck so his kids could go to Catholic central and one of his kids went to Eastern High for band. He loves it. It's just one of those neighborhood communities that hold its value. People care about their houses. Not a high turnover market. And it is convenient to the expressway too. Nobody's going to cut through Groesbeck either. Unless you know you're way through there. If you go up Wood St. you are going to get lost because there is no direct way through it. And I think that is what is so appealing. Where I live Harrison-people fly by my house. Totally a different neighborhood makeup, and I think why it is so appealing (Groesbeck). If you go to Groesbeck you are always seeing kids rollerblading or playing street hockey or basketball. They don't have to worry about traffic.

Q: Would you see that as a draw for people? (lack of traffic)

A: I think that that is very important but I think that family ties are just as important.

I am selling a house right now to a young couple and she said that "I love that nobody is going to go down my street unless they are going to visit my neighbors or myself and she is right. Their street dead ends to the back of the expressway. There is just not a lot of traffic. So I think that that is appealing.

Q: The schools- does that have an influence

A: Post Oak is an incredible elementary school very good school-very convenient right in the heart of the neighborhood. A lot of kids go there. A lot of kids go to Resurrection too because it is the one Catholic elementary school in the area. Some of the kids in the front go to Fairview. Fairview has an incredible reputation. So I think that have good schools in the area. The proximity to Catholic Central is a big pull too. If people's children are going to go to Catholic Central, Groesbeck is a great location for them.

Taxes are another thing. Taxes are so reasonable for them.

Q: If you had to rank selling characteristic, what would you put at the top?

A: I think Community is important over there, I would say that that is a big draw for people-neighborhood camaraderie.

You have got people who have lived there for 40 years - First time home owners - Young families and Empty nesters, who moved there because of the schools and now there kids are moving back into the area. So I think that community is very important to them.

Location I think is the second...

Schools, third. But I think Schools and location tie in together.

Q: You said it's pretty close to expressway and you can get anywhere.

A: People are saying that this new mall going in is going to drive down their property values but I think they are wrong. I could be wrong. I really do. I think Wood St. has always been busy and it's going to get busier and they will have to police it to make it more traffic conscious. You are not going to cut through Groesbeck unless you know where you're going our you are going to get lost. And I think that being close to the expressway makes Groesbeck desirable, you can go places and shop, to eat.

Meijer's is right there. Kroger's is right there. You have got every thing big. And you have also got Little Apple Market on the corner where everybody shops. I miss being able to, if you forget something, put your tennis shoes on, run two blocks to the store, and then run back home. I think that is a nice thing, it is just a great location. You can't go wrong.

Q: I'm glad that you brought that up. I'm doing a survey of the residents. Not sure where I am going to draw my boundaries. This area is business and apartments. I am wondering do you think that these houses that are really close here are negatively effected by the proximity to these businesses and apartments, or positively affected? Would that have an effect on their property value?

A: I don't think that it really does. I think the houses down through here, you know the Magnolia and Hayford that sort of butt up to the apartments, are owner occupied and they are very well maintained…

The Apartments have very strict rental rules, as far as your noise which are adhered to. A lot of older people from the neighborhood mover into those ground level apartments over there. So you don't have as many students and that makes a difference.

Same owners (of apartments) for quite a few years. That whole strip there. Chester to Fairview.

Q: Do you think that the Tollgate Wetland has an effect on property value in that neighborhood?

A: I really don't. I think of it as an added bonus after the fact. They appreciate it but there hasn't been enough changeover in the market on a regular basis to make that much of a difference.

Q: If nobody is selling homes there how are you going to know if it is driving up property values?? (Right, and there again I think that Groesbeck holds its values)

One of the things (Agent 1) talked to me about. He lives over in that area there. He lives somewhere South. He said he walks to the Tollgate. He talked about how it raises the quality of life in that area, and maybe that is why you don't see as much change over in that area.

A: Yeah, and that might be… I don't know. Lot of my friends have moved over there. One has six kids now and they are talking about adding on, you know expanding versus moving. Staying there. I think it is a community factor, I don't know if I necessarily agree with (Agent 1).

I lived on Francis for nine years and I think it was the community sense that was more appealing. Yeah maybe I think that maybe down the road it will help. It (Tollgate) will buffer Wood St. It is appealing. They are taking good care of it. I think it will help It can only help. Itself is not going to increase.

Q: I'm thinking in terms of the wetlands vs. the golf course? Which has the most effect? On what people think about the area as prospective home buyers.

A: It's the whole package. You don't have any access to the golf course from Groesbeck. You have to go way over –down Grand River back by Bancroft Park. I think it's family values. They like going golfing on Sunday. We sledded at Bancroft Park in the winter. I did that. My kids did that. It's just got that nice community feeling.

Q: It been fairly well proven that proximity to a golf course has an affect on property values?

A: But normally a private golf course. Not a public one. I mean nobody lives on the golf course. Groesbeck is one of the nicest courses in the Mid Michigan area. Ranked Number one as a public golf course. Nobody lives on the Groesbeck golf course. Not very integrated into the community. And it had been there so much longer (the golf course). I think before when people thought about living on a golf course is was a country club, there is different mentality that we had 20 years ago.

Q: If you took the Tollgate out and stuck it in a comparable area could it have an effect?

A: Trying to think of a comparable area... Possibly-it creates a nice buffer from Wood St. It is much more aesthetically appealing. You are looking at that instead of bare dirt. If you put it someplace else that had the same kind of makeup then I think it could make a difference. Dollar wise I don't know if it was that big of an expense versus the value that it brought to the area, as far as appealing not necessarily monetary value as far as the aesthetics.

Q: Do you think that they incorporated any features into the design, helped with the quality of life or just that fact that people use it?

A: Instead of just having a wetlands, they thought out how they were going to do it, what plants they were going to put in it and how they were going to maintain it. And I think the walking trail around it. The walking trail and benches. That was very well thought out. Any time you have benches in a place like that were people can actually utilize it, you are going to get more people that are going to use it. Otherwise all you have is a wetland area between two roads.

Q: Anything you think we missed?

A: I really can't. I think it's a nice place for a lot of people to meet your neighbors that they might not have otherwise met. I see a lot of people walking there dogs over there. It is a nice conversation starter. You see all ages-little kids and parents, a young couple, or a single person walking a pet, an elderly couple walking. And I think that that is what is very appealing too.

Q: For my survey I'm asking people what are some of the neighborhood characteristics that might have an impact the value of their property. So I am asking them these questions (hands interviewee the survey) Am I missing anything? Anything I don't need? Already I am going to change this question. Instead of saying The Lansing Schools I will change it to the presence of nearby schools.

A: That's definitely. It is different from the West Side neighborhood. Reword that a little bit maybe. Schools and churches are important. If they have one they are affiliated with sometimes that is a very appealing factor. Definitely reword that a little bit. When we lived over there my husband works in Ionia and he liked to hop on the expressway and go to work. Very convenient. Parts of the Groesbeck area are also in the city of Lansing and

I know that's very advantageous for taxes. If they work for the city in the city limits. And I think that that is a big plus too.

Q: Kind of thinking about this. The new mall. I wonder what people think about that and if they do think it will lower there property value.

A: Everybody over in Groesbeck has an opinion on it. There was some thought of putting a brick wall up, but people said absolutely not, "it will look like Detroit". They think it will increase traffic. I think it it's done properly it won't be a problem. A lot of my clients think they should make a walk way, all my young moms think that they should make a skywalk to walk over to spend time at the mall. I'd like to hear what you hear back. There's a lot of heated discussion about it.

Q : Should I call it "the new mall" -----

A: I think that that is a great idea. That is your local development right there. I mean that is the big thing.

Q: I am building an economic model-sales data from Lansing to the Groesbeck area. Getting at why people buy their house. Basing it on this guy's study (hand interviewee the Deaton Study). He included structural variables (floor space, number of bathrooms) Any thing jump out at you that you think I should include, or I don't need to include? –Ethnic variables-do they tie in?

A: No not in that neighborhood. You should probably touch on bi-level, because Groesbeck has a lot of those. Groesbeck you have everything from two bedrooms one bath to five bedrooms three baths. You are going to see everything up there. I don't think that you are going to be able to say this is the normal makeup of a home in Groesbeck.

Q: You think these are issues people definitely think about?

A: Yes. I don't think that the age of the house is that important in Groesbeck. The whole neighborhood was built in 1950's to 1970's. There is one little section called Irish Hills - if you live there you say they are all sections of Groesbeck. For people that live in Groesbeck, the Groesbeck neighborhood is from the expressway to Lake Lansing to Wood St. to Grand River. On the maps you might have Kimberly Downs, and you might have Zephyr Downs (??), but if you live there in your mind it is all Groesbeck.

End of interview.

Message From: Agent 2
Sent: Wednesday, August 07, 2002 4:46 PM
To: Eric Cline
Subject: Re: Groesbeck Research

Hi Eric, Sorry I didn't respond sooner! The Tollgate Wetland area isn't something I would probably highlight in an ad. But I've mentioned it before in a presentation for a home in the area because it was in a 2-3 block radius of the walking trail. Hope this helps.

INTERVIEW 3: 08/30/02, AT 1000HRS WITH AGENT 3 AT BRIARWOOD REALTY.

Q: Give me just a little bit of background about your experience in real estate in Lansing

A: I have been selling for two different companies for twenty one years. I grew up in the Groesbeck area. Groesbeck is one of my areas of expertise. East Lansing. I live in Okemos. Groesbeck to me is kind of a historical site. So I mean I have sold a lot of homes. About 75 a year for 25 years.

Q: I think I heard your parents live there.

A: They have lived there since 1967.

Q: You know the more people I heard...seems like they come back

A: Oh yeah a lot of people come back . Yeah A lot of the kids come back

Q: So what do you feel is the biggest draw in the Groesbeck area?

A: Well first of all I think the park zoning and the location. It's between both malls. It's near Frandor.

Now it's going to be near the new mall. It's near MSU. You've got East side location but still your Lansing prices. It's close to Catholic Central . The location. The convenience. The Catholic families picking the Catholic school system. Catholic families have kept this area really strong. I've got a lot of mixed opinions about the new mall. Some love it. Some hate it. When I talk to people a bit about buying homes they want to be close to schools, shopping, churches, hardware stores, highways and you know they don't want to drive too many miles to work. People are not going to cut through the Groesbeck area to get to the malls. If you lived on the main thoroughfares, like Lake Lansing Road, then people are going to cut through but not Groesbeck to get to the mall anyway. In the Groesbeck area itself, I think the mall is just a positive.

Q: We talked about the next question a little . About neighborhood characteristics. Anything else that you want to throw in there.

A: It sounds a little bit corny but there are just a lot of real nice friendly people in the Groesbeck area. My parents are getting up in age but they live in a two story house and they just don't want to move. They like their neighbors. They like the location. They can walk around there. They feel relatively safe. There is a lot of longevity there. Longevity brings a strong neighborhood element to it. There is not a lot of transience. The elementary schools...the Post Oak school and the Fairview schools are one of the best Lansing Elementary School system. Family type atmosphere in the neighborhood. I go up and down the streets and the same people are still in the houses- playing with their kids. A lot of them pass away and then the houses come up for sale. So a lot of them go from a two story but they want to stay in the area and then they go to a ranch. Groesbeck people are good folks.

Q: How much do you feel that those kinds of factors you are talking about affect the price of homes in the area?

A: Well you know the Groesbeck prices are not that far off of, let's say E. Lansing. Because of the square footage you can get and because of how sought after the neighborhood is let's say a 1500 sq ft ranch in Pinecrest here in E. Lansing and a 1500 ft ranch here in Groesbeck... you are still getting about the same price. What used to be a 20 % differential paying more for the suburbs. Groesbeck is still getting the same value for square foot. The values have really gone up say in the last five years. Especially. The prices have jumped in the last five years a lot.

Q: Well one of the things I had originally thought. Nobody has done this so far. I was going to say take a look at this map. And I was going to ask...take a look at this wetland...What properties would be affected by the wetland an increased price because of proximity to the wetland...

A: You mean that walking area. . is that the wetland you mean? How does that have an affect on property price?

Q: This is like 1996. Where they got the walking trails and all that.

A: How does that affect property values? I don't think it affects price. I think it's nice to have that area to go in walk in. They can walk and exercise. Have a nice little area. But if you mean do these two blocks have a greater value because they are closer to the wetland. I don't think it's going to happen that way. I don't see it that way. I see the wetland as a feature, like a park, to the whole neighborhood. Not just part of it. My parents live right in here somewhere and anyway. I think it's just a feature to the neighborhood and not to any specific part to the neighborhood.

Q: I am basing my research on this study done off a couple of different study. One is this EPA study in 1995. They said a home 300 ft or less (when all else is equal) from a body of water increases in value up to 27.8%

A: I don't agree with that. I think the whole neighborhood has just gone up in value because of building costs. And because of what you can build. And because of what it costs in the suburbs. They have just gone up in value because of the neighborhood. Tollgate has not changed the values. I don't agree with that statement.

Q: Do you ever use the Tollgate in a presentation?

A: I don't. It is very visible. People can see it. It is a lot like a park. It is nice. Nice characteristics. The water. You can see the birds, people walking around. Not a feature like a school system or close to the highways.

Q: What are some of the things you use?

A: Convenience, location, stability, friendliness, the two elementary schools, the new mall, the Catholic school system. . I don't see that (the Tollgate) as a big feature.

Q: What about the golf course? Effect on property values?

A: Yeah. that has been there so long since the 20's or 30's. Anytime you are near an open green space there is a kind of an aura. To the whole area. Being near recreation. Nice beauty. Even if you are not a golfer. A very affordable 18 hole golf course. I grew up on that golf course and it is very special to me. Fairview just backs up to it so we used to just jump the fence and play. Much more than the Tollgate. Opens up the land. Even if you're not a golfer. A place where people know you're not going to have 15 condos. Fabulous skiing and sledding for free. In winter. So really it's year round. Great. CC skiing is free.

Q: Is there a neighborhood in Lansing that you could compare to Groesbeck?

A: I think the Sycamore Park area by Lindberg and Mt. Hope and Pennsylvania. Much smaller. A lot of stability. The Lansing CC area is very strong. Another area very strong is the Colonial Village area. Tecumseh River Drive and Delta River Drive is nice. Hilly. Up and down. Brings topography to the neighborhood.

Q: I've got a lot of data from the city and township. I wanted to compare this neighborhood to other neighborhoods.

A: I think that, in a general feeling as a realtor, is that the Groesbeck area has appreciated more than the other areas.

Q: Lansing area rise in property values. Do you think the Groesbeck area has gone up more than others?

A: I would say that everybody has been doing 4 to 7 percent but Groesbeck area has been doing 6 to 10 per cent. Greater Lansing has been a fabulous, very affordable, 4 to 5 per cent values going up every year. Steadily they go up every year. They have never

remained stagnant. They go up every year. Groesbeck and Lansing has gone up every year - even during recession area times.

Q: Would you say that the property market is still strong in this area ?

A: It's been a tremendous year. One of the best years ever. Every year gets better. Interest rates and affordability makes a great impact. Tremendous year. Tremendous year. One of the best years ever.

Q: I can tell trying to get a hold of you guys. You are all so busy all the time.

A: I look at our sales, too. It's the last day of the month. All our August sales are on the board now. There's probably 80. And that is just this office. We have 3 other offices. There's 150 offices in the Greater Lansing Area Realtors.

Q: What is causing this?

A: Low interest rates. Affordability. Renters who are paying 750 a month for rent. They find out that they can go buy a house on a low down payment and have a 750 payment. So why not go buy? When you only need five hundred to a thousand dollars. Not major relocation from the big sources-GM, MSU, etc. General business staying here. People are moving in to Lansing and buying a house. So somebody buys your house and you need another house. Tenants buying homes starts the whole domino effect. If the tenant does not buy the market doesn't go. Lot of neighborhoods that used to be rental. Makes the neighborhood stronger. There are homes I wouldn't even have shown a few years ago. They were just too rough. Major changes on that low end.

Q: One thing, the EPA is talking about new development and talking about building around a pond. Incorporating a pond into the neighborhood. Making them a feature. Do you feel like that might increase the value of a property?

A: Where could they build? Usually the pond was there and somebody built around it. Wetland was already there. Somebody bought a plot of land around it. I don't see the Tollgate being a big benefit. I see it being a nice feature of the area. Because if you can exercise and walk and have a pleasant view of the golf course and the birds and that is just a feature of the neighborhood.

Well, they are talking about building now over there by the old BTS School, by Catholic Central, a couple of hundred homes. I guess we can see when you have some green space and you build what it will be. I think $150,000 brand new homes would be very popular. I think they would go over very well. People want to be close to MSU, Frandor, the new mall...The East side has got a lot of history and people believe in it and want to be close to it. People who went to school there and want to go back and teach there. That kind of thing brings strength to an area. Lansing is a good school system which sometimes gets a bad rap.

Q: Something I've got from talking to people in the neighborhood. Some people say the school system is bad and they will move.

A: I move a lot of families in and out. They might move in when the kids are3 and they move out when kids are 12 and 10 they move out. That's typical. The Catholic school system has been a huge benefit and a stabilizing factor. I love to sell homes in Groesbeck. They usually don't last more than two to four weeks.

End of Interview.

INTERVIEW 4: 09/12/02, AT 1900HRS WITH AGENT 4 AT COLDWELL HUBBELL BANK AND REAL ESTATE.

Q: Your background in Real Estate?

A: Well obviously I have been a realtor for about six years now. We do sell in the Groesbeck area. We primarily specialize in residential property. I am pretty familiar with the area. We are from Dimondale-a suburb of Lansing.

Q: What do you feel are the biggest drivers of property values in that area.

A: First, the proximity to E. Lansing and to MSU. The value of the property compared to the closeness to E. Lansing and to MSU. It's very affordable. Second, a best buy situation for a number of reasons. Property taxes are Lansing Township and so they are lower than they would be in E. Lansing or even in Lansing city limits. . The houses are well maintained. They are not huge. 1000 to 1400 sq. ft. Tend to be built from 1940's to 1970s. They have been well maintained. It's safe . You see people walking. Kids and dogs. That's very important.

What doesn't drive it so much is the Lansing school district. They are happy with elementary. What happens quite often we have noticed is that at High school age it happens quite a bit that they go to private or parochial schools. Not unusual.

There are clearly some prime factors. The houses are affordable. The taxes are relatively low. Proximity to Lansing and MSU are important. Of course you are focusing on the drainage project. That's helped a lot . I would estimate that 90 per cent of the homes have basements. What's happened with the project. That has dried them up and made a tremendous distance on resale. Two things that kill us in our business are location and wet basements. That has helped them a lot. It's made a tremendous difference. There's no doubt about it.

Q: I am doing a survey in that neighborhood. I have interviewed a lot of people and they are kind of on the fence. Of course you know there's that lawsuit. I don't know if they necessarily...

A: Some of those individuals have paid. There is an assessment for that. What they got back for that in a period of ten years is remarkable...It makes a tremendous difference – there is no doubt about it.

Q: Do you feel that the Tollgate Wetland has an effect on property values in the area?

A: I don't think there is any question about it. That's just an absolute yes. I know that you've talked to other realtors. If any realtor told you no, it doesn't have an effect, I am surprised. No question that it has a positive effect It has a negative effect for the immediate home owner who paid for it in the assessment. But in the long haul , the wet basement doesn't sell or it sells for less money.

Q: That's interesting. That's an opposite response that I have gotten from other realtors.

A: I am surprised. Just really surprised.

Q: Well, they have said that it is a positive asset to the neighborhood. But as to whether it has an impact, an effect on property value, no one has told me yes so far.

A: Well to say to someone did you buy this house because it does not have a wet basement. That doesn't happen. But what you run into is someone doesn't buy a house because it does have a wet basement. It does not matter where the home is a wet basement is the next thing to death in the sale of a home. People just don't want that. No question it has a positive effect.

Q: You are coming at it from a different angle than they are. They were looking at it as a quality of life thing-there is a walking path there, it is pretty. As a way to attract people into the neighborhood.

A: And that's all true. A walking path there. Something to look at. It's really nice. Birds. Somewhere to walk. I don't think that is a main feature. It's an attractive feature. People walk all over in that neighborhood. But I don't think that everyone in that neighborhood walks on it. People on the perimeter - the immediate vicinity - might. It's just another place to walk. Not everyone that benefits from the project walks around it. The benefit is the drainage-no question.

Q: I wrote this question thinking about aesthetic amenities and not the drainage. My question is about the aerial extent of the effect it would have on property value. I am guessing you would say all the homes that were in that assessed area that benefited from the sewer separation.

A: Definitely, not from the aesthetic standpoint but rather from the practical standpoint. The benefit. If you are talking the catchments pond itself. The value to the homeowner in terms of just walking around and seeing that is probably not going to radiate much more than two or three blocks back into the various developments....they just don't use it. It's

like a park. If you are six blocks from the park you don't use it. If you are two blocks away, you do. It's that kind of thing. Aesthetic-it's pretty to drive by for others.

Q: So could you put a dollar amount on the kind of value that you are talking about? I know that is a hard question.

A: That is a hard question. In terms of resale value on a home at this point in time. Our market's going through the roof. Homes are selling for far more than they have. These are good times in greater Lansing. Homes are selling for more than they have. Homes with wet basements will sell for two to five thousand dollars less than those with a dry basement. It's hard to quantify that. Maybe even more. We sold one recently and it's had a wet basement - not landscaped properly and that was a factor in the buyer's mind and it meant a lower price.

Q: When you are selling a home in that area, do you use the wetland as something that you would point out for them?

A: We have not. Certainly we would if it would be one block from it. Or two.

Q: I'm kind of thinking you would not want to point it out to them. Thinking about this drainage point of view. That might plant a bad seed in the buyer's mind.

A: Absolutely. For example there has been construction in the streets. That is bad news from a realty point. They are fixing something wrong. It gives a negative impression.

Q: One of the things I am grappling with. I am building an economic model. I am looking at the aesthetic value of the wetland and the value of the golf course. Do you feel like those are two separate entities?

A: Yes. I have never viewed the golf course as being a major plus in that neighborhood. Individuals that live in that area use it some. I suspect there are far more individuals who use the golf course that are coming from somewhere else. I have not gone over there and quizzed anybody. There's a mix of individuals living in that neighborhood-lots of professional folks-lots of folks work in Lansing and MSU. Their focus is not the golf course. Wood St. separates it. It's harder to get to from that side. Originally it was a bigger draw than it is now. It's not a modern golf course that people drive to. They go to it because it is close. No great features.

Q: So if you moved the Tollgate around to another neighborhood would you say that it would be an advantage? Would it have the same effect?

A: Depends on the neighborhood. Not every neighborhood needs sewer separation. Some do. Some don't. In the Lansing area. It probably would have the same effect...If you had the same need. Aesthetic standpoint not that great an effect. Practical effect, You bet.

Q: Would there be any types of neighborhood that would value the wetland more?

A: Sure it would have to be a neighborhood like Groesbeck. People walking. Kids and dogs. People who would value the wetland. A safe neighborhood. People get out in the nice weather. To value something like that. It's real hard to place a catchment area, what you call a wetland area in the middle of downtown Lansing. You don't really need it anyway. But it would very little value there. It also has some value in older established areas where they are having a problem with wet basements.

Q: What attracted me to this neighborhood was the idea....they thought we could pipe it all to the river or we could do this , build this catchment basin, and make it something more. Do you feel the neighborhood values from this alternative plan? You said it's limited.

A: It's enhanced the neighborhood. There's water where there wasn't. A lot of the newer developments have a pond or water of some kind. That is a selling point for us. To sell a house on a pond enhances its values.

Houses with pond frontage are clearly more. With this project if some of the homes have actual frontage, if you will, it would make a tremendous difference. This is set up more like a park. With that neighborhood, it was a good choice. If homes had a back yard that backed up to that, it's a whole different ball game, in terms of price.

Q: Yeah you know I didn't really think about that. If someone retrofit a storm water system. If you could have it abut certain properties it would have a big effect.

A: Tremendous effect. Absolutely tremendous effect.

Q: In dealing with the Tollgate's value outside of drainage - What features of the wetland really affect property values?

A: Walking trails are a nice feature. People are always walking there. Good weather. Morning. Evening.

Q: What about open water?

A: Sure. It's pleasant. It's nice to see the water. A few cattails out there. A little reprieve from the city.

Q: Do you feel like there's any comparable neighborhoods to Groesbeck?

A: No not in terms of price and value. There are a number of places like the same fit and feel and style of neighborhood. But price. Just an example....the governor's residence in Mt. Hope area-houses all built same period of time. Basically 40's through 60's Much larger homes. More expensive. 175 to 300 thousand. Lots of wet basements. Same type.

Lots of people walking. Professional folks. Kids and dogs. Clearly an area where a project like this would be an enhancement.

Q: Earlier you said greater Lansing real estate is going through the roof. How does Groesbeck compare to that?

A: Clearly it's in the middle of the pack. 130 to 180, The vast majority sell for less than 145.

Q: I am thinking of increasing in value from year to year

A: It is still in the middle of the pack. Okemos 10 % a year. Wonderful investment. Some areas are 3 to 4 %. Groesbeck is probably doing 4 to 6 % a year.

End of Interview:

Appendix 6

Transcribed Interviews with Property Appraisers

INTERVIEW 1: 09/23/02, 0830 HRS WITH AGENT 5 AN APPRAISER AT LAZAR AND ASSOCIATES.

[problems with tape in the beginning of interview]

Q: Do you feel that people are drawn to the Township, or City sections of the Groesbeck neighborhood?

A: This is another discussion that my partner and I have had.

There are some people, even though it's in the Lansing School District, who moved to this area, to be in the township because the taxes are lower.

The other thing is, right where this wetland is mostly not single - family property except over here on - uh what's the name of this street. [Hopkins] [interviewee is referring to a map of area]

Here is Wood Street and here is the opening, whatever, research thing MSU has.

Here is Fairview and between Fairview and Hopkins that's either multi-families, those townhouses, or it's those duplexes. Those are the ones fronting essentially on the wetland. Not the neighborhood over here, that's farther north.

There's some benefit as you go up Wood St. Those single family homes that front on the golf course are nice and I think some people like that because of the view. Um, and then I know that a lot of people are very upset right now because the traffic has been so high. I have driven by there and seen the police station themselves trying to slow down the traffic. I think that will partially go away once the construction traffic is less. Once they finish all their work on uh.....People are cutting around. They don't have much of a choice. I think there are some things that the city or the road commission could do to slow this traffic on Wood Street. There is really not that much traffic in comparison with other city street.

The other thing is – you've got the golf course that keeps going north. And you've got that other neighborhood and I don't see anything improving in that neighborhood at all. Very blue color. Old stock. I don't see that the golf course did a thing for that.

Q: Well that's definitely something I could talk to realtors about. If they feel like maybe the golf course is more integrated into the community.

A: Yeah if it was like a golf course style community but it's part of their parks system. The good thing about Lansing is they've got a wonderful park system. I don't think

people realize how good their parks system is and this is a great golf course. It's a good buy. It's fairly challenging. Golf .....they've done a wonderful job on it. I still don't see that being something that people use to market that area. So...I think the thing about Groesbeck area is that housing stock is in good condition. You can tell that the owners are – it's important for them to take care of their homes. It's newer than other housing stock in the city. It has easy access to the expressways which I think makes it more desirable. People can send their kids to the elementary school there and feel pretty comfortable about getting a good education in the Lansing District. That school is right in the middle. It's not as though it's on the fringe. Like Fairview Schools, it's kind of on that corner and is somewhat exposed. And I think that, um, quite honestly, that shopping center being there is going to draw people to Groesbeck more than the golf course will. Over time, you are going to get a real spike in traffic because it's new and everyone wants to see it and that will ameliorate over time. Now a colleague of mine –we went away this week and I asked him because he has a lot of real estate –mostly commercial-in and around the Lansing area and he made a real interesting observation. He said he didn't think that people were going to be drawn to the shopping center because of the new shops as much as they were going to be drawn there because of the new restaurants.

The restaurants will then be what will - when you get the people going to the restaurants, the secondary part will be let's go to that store or this store. There may be some credence to that. Lansing is not known for its upscale dining opportunities . This is a real meat and potatoes kind of a town. So it will be interesting to see if that plays itself out. I'm having a hard time understanding how we can have all of these huge sporting goods stores. Dix is going to be there. They opened up this huge store in the Meridian Mall and then we have MC Sporting Goods on the west side and then Gander Mountain and I just think the market's saturated and I don't know. On the upside, there are some stores going in there and I don't have to go to Detroit now. I would go to Novi or Troy and now I can shop here.

The other thing about the Groesbeck neighborhood and the Lansing market in general. It's kind of a boring market. It's kind of steady. You don't see these huge spikes. Supply and demand seems to be over time, in my opinion relatively steady. There are some hot areas in the suburban east and west and south sides. Even there right now like the Dewitt area, there was a lot of stuff for sale. Meridian Township there's not quite as much stuff for sale right now and I don't know...this is sort of kind of....because of the economy. I think there's been some slowing in those upper level luxury housing right now.

Q: You feel like the Groesbeck area is a stable area? Property values will be steadily going up because of these features we are talking about.

A: Yes, I think when people make the decision. I have to live in Lansing either because I can't afford to live in an outlying area. Or I have to live here because of my job. I have to live in Lansing because of money they will pick certain areas that will be driven by the quality of the homes and the school. They would be younger families with elementary school children or people that don't have children yet or don't have children period and they are not concerned about the schools. I think the two negatives for the city of Lansing

are the school district. And the quality of the housing stock. You've got a city where 50 per cent of the housing stock is rental. You have very old housing stock. You have to get over those two hurdles for Lansing to be competitive with the outlying areas.

The Boys' Training Center. It is interesting there was an editorial in the LSJ today about how Lansing should stop trying to compete with the outlying areas because they're never going to be able to do that. Something that is more-ah- helps Lansing . I don't know. It'll be interesting to see what happens. That property is sitting there for a goodly long time. They've studied and studied that. They really do need to make a big investment in that whole area around Eastern HS. There are a couple of developers redoing houses across Pennsylvania and trying to convert them to single family residences.

Q: Could you really quickly give me your background?

A: I am a real estate appraiser in Lansing. My partner and I have a real small – I only do it part time. Used to be his full time.

Q: So you've known about the Groesbeck Area?

A: I've lived in the Greater Lansing area for over 20 years.

Yes, I am familiar with it. I know people who made the decision that, if they were going to live in Lansing, that's the area they were going to live in.

I am real familiar with the golf course because one of my former partners worked as the Director or Real Estate and the Dept of Budget and that was a property that the city of Lansing didn't own. It was on a long term lease for one dollar with the DNR. That piece of property and the Boys' Training Center was part of a transaction to give those properties to the city of Lansing so that they would have full access. So and I kind of know what is going on in that area. I have seen the study for the Boy's Training Center. There has been a lot of talk about that property by the Armory- that should be developed- I am pretty familiar with that.

Q: You feel that Lansing is pretty stable and you feel that Groesbeck is going to increase in value?

A: I would say that within the city of Lansing that is probably true. The only way we're going to know is to see some sales. But on the average you are seeing, according to the market, 6 per cent or better increase in the market on a per year basis.

Q: What would you say about the Groesbeck area?

A: I would say it was probably about six per cent. Again, until we pulled some sales and looked to see what was happening over time.

Q: I am curious as to how neighborhood characteristics factor into appraising a property?

A: What would happen. You are probably going to talk to the assessor's office because they are dealing with large numbers of sales. They may take the city and divide it into neighborhoods and look at just what is happening in this particular area. For example, it I was doing assessments, I would be looking at the area that would be bounded by Saginaw, 127 and probably back to Cooper St. or whatever that other street is. That's a distinct neighborhood.

Q: How do you factor in that stuff?

A: We have to factor in what are the defined boundaries of the neighborhood. That is a question I do when doing an appraisal. Groesbeck is a defined neighborhood and has defined boundaries and so I want to find other sales in Groesbeck that are close to my subject. So let's say my assignment is a two story, center entry, colonial, partial brick, three to four bedrooms, maybe two to two and a half baths, full basement, two car garage. That would be typical. I am going to be looking for other homes that have sold in that neighborhood that are similar in terms of size and appeal, lot size, to compare against my subject. Then I am making adds or subtracts as I do that. I might be making a deduction or an addition according to superior or inferior. Usually I make an adjustment on a per square foot basis.

Q: Do you do an average per square foot.

A: I would say the average contributory value on a gross square foot basis would be 25.00 per sq foot. I look at a house that has 2500 sq. foot and the subject only has 2400 sq. ft then I come up with a deduction of 2500.00 It gives you a leveling out. Typically you will want to use three possibly four other pieces of property to compare to the subject. Then you are using judgment to arrive at your value. You are not supposed to average or weight. Sometimes people use bracketed sales. If it went a little higher or a little lower. You are getting a good sense of what is going on.

It would be inappropriate if I was appraising a ranch style home to use as a comparable a two story home or a Bi-level home. You want to get something as close to the subject as possible. Sometimes you can't do that. You have to go into a competing neighborhood. What would be a competing neighborhood to Groesbeck. It would be something that is still in the Lansing School District. That has housing stock still similar. I might go across 127 and go into the neighborhood that is bounded by Saginaw and Coolidge and backs up the expressway. It's still in the Lansing School Dist. The housing stock is about the same age. I might make an adjustment that it is now in the township and not in the city. Because there is a difference in taxes and that has to be accounted for.

Q: The more people I talk to in that area....it is a draw.....to move into the township.

A: My personal opinion about that is that is false. Yes your taxes are lower. You don't get all the services. Lansing Township is very weird because it is split. Half is on the East. Half is on the West. How do you get good police service in that situation. Or good

fire service. I would think it would be a challenge. Versus Meridian Township where it is all contiguous and it's within a 36 mile radius. You are still not getting the quality of service that you are getting in the city.

Q: That's kind of touching on what you mentioned earlier about the structural features of the house. Those are the ones you are primarily considering when you are evaluating a house?

A: Yes the location. Do I have comparables? Are the overall features of these other sales similar to the property I am assessing. You go through a thought process to say yes these things are all displayed or pretty similar to arrive at a conclusion. Lots of times they are going to ask for a cost approach but with older housing stock it is not particularly reliable because you are making some subjective decisions about how you are going to depreciate the property. Some of those may be just because of physical depreciation and others are like functional depreciation, where having one car attached garage is really not as desirable as having a two car attached garage. So you have something that is a functional problem.

You also sometimes have to do the income approach. Not particularly reliable when you are dealing with single family residential because in theory there are not going to be a lot of rentals in the area. Doesn't really give you a true picture. What gives you the best picture is what have other houses sold for?

Q: Using the sales comparison approach you are incorporating some neighborhood variables in there.

A: Right that's important for underwriting. They want to know. What kind of fire protection. Police. Is there private ownership. Schools. In comparison to other houses, how would you rate the condition of this house. You are comparing this house to other houses in the neighborhood. Not for example this house to White Woods. Not a fair comparison to what's going on.

If I'm just curious as to how the neighborhood actually affects the house in terms of property appraisal. Well if I go across to the property just across from Sparrow Hospital on Mi Ave. That neighborhood, I don't know what it is called. You have, in my opinion, a fair number of rentals. You can see that private ownership is not as evident as it is in Groesbeck. More deferred maintenance. You may even see orange stickers-where the city has condemned them. Much older housing stock. A lot of the housing stock is so old that it doesn't have the modern conveniences that you would expect. It might not have garages. The lots are smaller. You probably wouldn't have more than one and a half baths if that. Those types of things. So you could start making comparisons to other neighborhoods. But, again, the sales will tell you something about what is going on in that neighborhood. You may see a house in Groesbeck selling for 150 or 175 thousand dollars. If you moved into the other neighborhood you might see houses selling for 75 or 80 thousand dollars so the market is telling you that this is not as desirable for a lot of reasons.

Q: Do natural resources ever figure into appraisals? Can people be drawn to natural features, something like the Tollgate?

A: I think that people would consider the Tollgate. Whether it's the driving factor I don't know.

Q: Well one of my ideas initially. I was going to have everybody draw a circle around the Tollgate where they might think they might be a premium. I got this idea from other studies – one of the things is 1000 feet. So they can draw a circle and say that these houses within a thousand feet have a certain property value impact.

A: I don't think you can draw that conclusion for Groesbeck. You can't draw it for inner city properties. In some ways you may be able to draw an opposite conclusion if you have a combo of school and city park together. In some instances it is less desirable. There is more traffic. There are other people coming into their neighborhood that they don't know. It can be a disadvantage too.

Q: One thing that you hit on - you talked about - the Tollgate Area and the golf course are not integrated into the neighborhood. They butt up to the neighborhood. Each stands distinct on its own. Not like little fingers going into the neighborhood. Do you feel Wood St. really separates the neighborhood from the golf course and that is one of the reasons why it might not have an effect?

A: Yes that is the dividing line. It is pretty evident.

Q: Do you feel that if the Tollgate was more integrated into the neighborhood it would have a property value impact?

A: For instance I can talk about my neighborhood. Mark Abood and I have had this discussion and I have had it with other people. We have some natural areas in our neighborhood that were kept out of building because they were there. What the developer did is he sort of butted up the houses to these natural areas and I think if you went and did extraction of the sales you would probably find that, for those houses that back up to these areas-they have created walkways and we have some small lakes. The ones that are backed up to the lakes that there is a bit of a premium for those versus the ones that are not enjoying not having another house sharing common back yards.

Q: So you feel like that is the driver. Because there is open space or because of the scenic value.

A: I think the developer used it to his advantage and I think people liked it. Personally I don't like it. One reason is it's buggy and it's wet. Some people think it's slick. Creates more privacy for them. The developer integrated it into the neighborhood as they also integrated---tennis courts, common areas. They made a real effort. Here there is no

integration. It is just there. It's not like there is an exclusive golf course community. Something like Florida. Where they put the houses all around the golf course. That's not what this is.

Q: There is a study. In 1995. A development. And they had tried to incorporate some of these. A lot of the developers felt they could charge more for these homes. And I'm wondering if that holds true to the Tollgate. And if eventually that would factor into the Tollgate.

A: Have you interviewed the assessing office yet? I bet you they will tell you no.

Now an interesting thing to compare would be. You know the county recently opened up a brand new park in the middle of the city of Lansing in the area of very average housing stock. That's right off of Cavanaugh. It's called Hawk something. Hawk Island. It was a sandpit. A barrow pit for mining. They made it into a place to go swimming, a little bit of boating and fishing. When I talked to people in the zoning office, she was telling me t hat she thinks that whole area is going to take off. Partly because of the park.

End of Interview:

INTERVIEW 2: 09/30/02, 1030 HRS WITH AGENT 6 AN APPRAISER AT LAZAR AND ASSOCIATES.

[This interview was not taped at interviewee's request]

Notes:

The interviewee is a semi-retired appraiser with over 20 years experience in the field. He was in the International Association of Appraisers and chair of the Education committee. Agent 6 reaffirmed many of the same important neighborhood characteristics identified by the previous interviewees, including the elementary schools in the area, proximity to freeways and shopping. The agent felt that proximity to the wetland would provide some property value increase, but would not elaborate. And felt that the fact that the wetland was separated from the nearby properties by roadways would significantly lessen any impact. Of note, the agent identified several smaller pocket or sub-neighborhoods within the northern half of the study area, mentioning that he resides there and some people in that area do not consider themselves part of Groesbeck. When asked why they did not consider themselves part of the neighborhood, he replied that some elitism was involved.

Appendix 7

Survey Responses

Q1. How long have you lived in this house?	N	Range	Minimum	Maximum
	46	54.9	0.1	55
	Mean	Std. Dev.	Variance	
	19.7865	17.8943	320.206	
Q2. Does your household rent or own?				
(N = 46)	Frequency	%	*	
rent	2	4.3		
own	44	95.7		
Q3. Original attraction?				
	Frequency	%		
location	8	17.4		
affordability	9	19.6		
neighborhood	15	32.6		
saleability	2	4.3		
local schools	3	6.5		
transportation/accessibility	11	23.9		
family-n.hood oriented	3	6.5		
quiet/safe	5	10.9		
local wetland	1	2.2		
attributes of homes	11	23.9		
other	17	37		
Total responses	85			
Q4. Positive char. of neighborhood?				
	Frequency	%		
location	12	26.1		
affordability	1	2.2		
neighborhood	3	6.5		
good exterior maintenance	13	28.3		
saleability	3	6.5		
local schools	2	4.3		
transportation/accessibility	8	17.4		
family-neighborhood oriented	18	39.1		
quiet/safe	19	41.3		
local wetland	2	4.3		
local parks	2	4.3		
local golf course	1	2.2		
attributes of homes	3	6.5		
other	13	28.3		
Total responses	100			

Q.5 Negative char. of neighborhood?				
	Frequency	%		
traffic	9	19.6		
poor exterior maintenance	2	4.3		
poor wetland maintenance	2	4.3		
number of rental properties	2	4.3		
stormwater drainage/flooding	1	2.2		
new mall	6	13		
local government concerns	3	6.5		
none	17	37		
school district	2	4.3		
other	8	17.4		
Total responses	52			
Q6. Are there things about this neighborhood that you believe either increase or decrease the value of the house that you live in?				
(N = 46)	Frequency	%		
yes	41	89.1		
no	5	10.9		
Q7A. Positive char. of n.hood, impact p.v.?				
	Frequency	%		
location	7	18.4		
neighborhood	6	15.8		
good exterior maintenance	14	36.8		
saleability	1	2.6		
local schools	2	5.3		
transportation/accessibility	2	5.3		
family-neighborhood oriented	8	21.1		
quiet/safe	4	10.5		
local wetland	2	5.3		
local parks	1	2.6		
local golf course	1	2.6		
other	19	50		
Total responses	67			

Q7B negative char. of n.hood, impact p.v.?				
	Frequency	%		
traffic	1	2.2		
poor exterior maintenance	9	19.6		
number of rental properties	1	2.2		
stormwater drainage/flooding	1	2.2		
new mall	7	15.2		
NA	3	6.5		
none	19	41.3		
school district	4	8.7		
tollgate tax/assessment	1	2.2		
other	4	8.7		
Total responses	50			
Q8a. How does the presence of nearby schools impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	29	63		
negative impact	3	6.5		
no impact	10	21.7		
I do not know	4	8.7		
Q8b. How does the presence of the golf course impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	31	67.4		
negative impact	0	0		
no impact	11	23.9		
I do not know	4	8.7		
Q8c. How does the presence of nearby parks impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	38	82.6		
negative impact	0	0		
no impact	7	15.2		
I do not know	1	2.2		

Q8d. How does the presence of the local wetland impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	29	63		
negative impact	5	10.9		
no impact	11	23.9		
I do not know	1	2.2		
Q8e. How does the distance to work impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	35	76.1		
negative impact	1	2.2		
no impact	6	13		
I do not know	4	8.7		
Q8f. How does the amount of local traffic impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	13	28.3		
negative impact	12	26.1		
no impact	20	43.5		
I do not know	1	2.2		
Q8g. How does the new mall impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	24	52.2		
negative impact	10	21.7		
no impact	3	6.5		
I do not know	9	19.6		
Q8h. How does the access to freeways impact the value of this property?				
(N = 46)	Frequency	%		
positive impact	41	89.1		
negative impact	2	4.3		
no impact	0	0		
I do not know	3	6.5		

Q9. Greatest positive impact on p.v.?				
	Frequency	%		
nearby schools	10	21.7		
Groesbeck Golf Course	3	6.5		
nearby parks	1	2.2		
local wetland	3	6.5		
distance to work	3	6.5		
amount of local traffic	2	4.3		
new mall	1	2.2		
access to freeways	7	15.2		
none	9	19.6		
other	17	37		
Total responses	56			
Q10. Over the past five years do you believe that the residential p.v. in this area have gone up, down or stayed the same?				
(N = 46)	Frequency	%		
up	43	93.5		
down	1	2.2		
I do not know	2	4.3		
Q11. Are you familiar with the Tollgate Wetland?				
(N = 46)	Frequency	%		
yes	42	91.3		
no	4	8.7		
Q12. Did the proximity of this home to the Tollgate Wetland have an influence on your purchase of a home in this area?				
(N = 46)	Frequency	%		
NA	33	71.7		
no	11	23.9		
yes	2	4.3		
Q13. What was your attitude toward the Tollgate Project when it was first proposed?				
(N = 31)	Frequency	%		
positive	12	38.7		
neutral	7	22.6		
negative	9	29		
I did not know about it	3	9.7		

Q14. Change in attitude towards Tollgate?				
	Frequency	%		
no change	17	37.8		
NA	17	37.8		
poor maintenance(-)	3	6.7		
recreational access(+)	3	6.7		
local government concern(+)	1	2.2		
now positive	9	20		
scenic value(+)	1	2.2		
neighborhood attraction(+)	1	2.2		
now negative	1	2.2		
Total responses	53			
Q16. Overall, do you think that the wetland has been a plus or a minus for this area?				
(N = 43)	Frequency	%		
plus	32	76.2		
minus	3	7.1		
neutral	7	16.7		
Q17. Positive aspects of Tollgate wetland?				
	Frequency	%		
none	6	14		
recreational amenities	25	58.1		
green/open space	9	20.9		
scenic value	7	16.3		
wildlife habitat	11	25.6		
flood storage	4	9.3		
environmental resource	4	9.3		
neighborhood/community center	5	11.6		
other	6	14		
Total responses	77			
Q18a. As a possible advantage of a local wetland, do you think that access to walking trails applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	41	95.3		
does not apply to tollgate	1	2.3		
I do not know	1	2.3		

Q18b. As a possible advantage of a local wetland, do you think that bird watching applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	38	88.4		
does not apply to tollgate	2	4.7		
I do not know	3	7		
Q18c. As a possible advantage of a local wetland, do you think that scenic value applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	34	79.1		
does not apply to tollgate	9	20.9		
I do not know	0	0		
Q18d. As a possible advantage of a local wetland, do you think that wildlife habitat applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	34	79.1		
does not apply to tollgate	6	14		
I do not know	3	7		
Q18e. As a possible advantage of a local wetland, do you think that stormwater treatment applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	22	51.2		
does not apply to tollgate	6	14		
I do not know	15	34.9		
Q18f. As a possible advantage of a local wetland, do you think that increased property value applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	21	48.8		
does not apply to tollgate	16	37.2		
I do not know	6	14		

Q18g. As a possible advantage of a local wetland, do you think that neighborhood meeting place applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	28	65.1		
does not apply to tollgate	12	27.9		
I do not know	3	7		
Q18h. As a possible advantage of a local wetland, do you think that open space applies to the Tollgate?				
(N = 43)	Frequency	%		
applies to tollgate	35	81.4		
does not apply to tollgate	5	11.6		
I do not know	3	7		
Group $Q19 negative aspects of tollgate wetland				
	Frequency	%		
none	22	51.2		
tax/assessment	3	7		
poor maintenance of wetland-weeds	10	23.3		
drought - effect on wildlife	4	9.3		
mosquitoes	5	11.6		
security - safety	3	7		
open water hazard	2	4.7		
increased flooding	1	2.3		
other	3	7		
Total responses	56			
Q20a. As a possible disadvantage of a local wetland, do you think that increased taxes applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	12	28.6		
does not apply to tollgate	16	38.1		
I do not know	14	33.3		

Q20b. As a possible disadvantage of a local wetland, do you think that child safety applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	11	26.2		
does not apply to tollgate	28	66.7		
I do not know	3	7.1		
Q20c. As a possible disadvantage of a local wetland, do you think that nuisance animals applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	4	9.5		
does not apply to tollgate	34	81		
I do not know	4	9.5		
Q20d. As a possible disadvantage of a local wetland, do you think that nuisance people applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	1	2.4		
does not apply to tollgate	39	92.9		
I do not know	2	4.8		
Q20e. As a possible disadvantage of a local wetland, do you think that increased traffic applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	3	7.1		
does not apply to tollgate	39	92.9		
I do not know	0	0		
Q20f. As a possible disadvantage of a local wetland, do you think that basement flooding applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	3	7.1		
does not apply to tollgate	32	76.2		
I do not know	7	16.7		

Q20g. As a possible disadvantage of a local wetland, do you think that noise applies to the Tollgate?				
(N = 42)	Frequency	%		
applies to tollgate	0	0		
does not apply to tollgate	42	100		
I do not know	0	0		
Q21a. How often do you visit the Tollgate Wetland in the summer?				
(N = 46)	Frequency	%		
daily	7	15.2		
1+ per week	17	37		
1 per week	2	4.3		
1 per month	3	6.5		
1+ per month	2	4.3		
1 - 10 times per year	7	15.2		
never	4	8.7		
NA	4	8.7		
Q21b. How often do you visit the Tollgate Wetland in the winter?				
(N = 38)	Frequency	%	Valid Percent	
daily	1	2.2	2.6	
1+ per week	5	10.9	13.2	
1 per month	2	4.3	5.3	
1 - 10 times per year	2	4.3	5.3	
occasionally	3	6.5	7.9	
never	21	45.7	55.3	
NA	4	8.7	10.5	
Total responses	38	82.6	100	
missing**	8	17.4		
** in the beginning of the survey, I didn't ask people to break down their seasonal use				

†Q22a. When visiting the wetland, do you bird watch?	Frequency	%		
no	32	76.2		
yes	10	23.8		
Total responses	42			
Q22b. When visiting the wetland, do you jog or walk around the trails?	Frequency	%		
no	4	9.5		
yes	38	90.5		
Total responses	42			
Q22c. When visiting the wetland, do you visit with neighbors?	Frequency	%		
no	37	88.1		
yes	5	11.9		
Total responses	42			
Q22f. When visiting the wetland, do you enjoy the view?	Frequency	%		
no	39	92.9		
yes	3	7.1		
Total responses	42			
†These are unprompted questions see Appendix 1				
* % = the percentage of respondents that answered the question with the response indicated				