

# **The Distinguished Developments Scoring Sheet for Conservation Design**

*A Prospective Policy Analysis  
Prepared December 2012 by  
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on behalf of*

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and  
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## Executive Summary

### The Problem

With demand for further residential development comes the threat of damage to the natural environment on which Minnetonka residents place a very high value (Decision Resources, 2009-2012; City of Minnetonka Natural Environment Team, 2011-2012). Common problems caused by development may include, but are not limited to: loss of woodlands, loss of remnant ecosystems, erosion, and impairment of surface waters by runoff (Minnesota Environmental Quality Board, 2012). Such damage threatens to reduce the high non-market value residents place on their natural environment, as well as the high market values of individual properties (United States Census, 2010; author's primary research data, 2012 [see below]).

The clients presented the Conservation Design Scorecard created by 1,000 Friends of Minnesota and the modified version created by the City of Minnetonka Natural Environment Team, as a potential tool for addressing this problem. A copy of the Minnetonka version, *The Distinguished Developments Scoring Sheet* appears here as *Appendix A*. The measurements it comprises have been numbered for easier reference. Ms. Collieran, Natural Resources Manager, and Ms. Thomas, Principal Planner, requested a policy analysis that would answer the following questions:

- (1) Will the scoring sheet be an effective tool for Minnetonka?
- (2) How does the scoring sheet compare to similar alternatives being used elsewhere?
- (3) What else can we incorporate in order to make the scoring sheet a better tool?

### Summary of Alternative Solutions Evaluated in this Analysis

- I) Continue business-as usual (with no use of a conservation design scoring sheet). Rely on existing ordinances and the city's natural resources manager to guide developers.
- II) Use the current *Distinguished Developments Scoring Sheet* for guidance and evaluation of development plans as a voluntary process with incentives. (For a copy of the scoring sheet, see pp 38-42, *Addendum*.)
- III) Pass an ordinance requiring a minimum score of 80% on the scoring sheet for initial development plans.
- IV) Tailor the scoring sheet to the unique goals of Minnetonka residents and government. Incorporate scoring sheet measures into city ordinances, requiring a minimum score of 80% ("B") on this scoring sheet for initial development plans. Provide incentives for developers who achieve "A" scores. Offer technical education for conservation design and stewardship to both developers and homeowners' associations.

### Key Findings and Recommendations

The *Distinguished Developments Scoring Sheet* could be an effective tool for the City of Minnetonka. It compares favorably to conservation design measures and policy tools used elsewhere. There are, however, several small changes that can be made to modify the scoring sheet for the unique needs of the city. In addition:

- A documented education program for homeowners and developers may increase social acceptability and long-term success of conservation measures.
- Use of the scoring sheet as part of a voluntary program, with incentives and education, may be the best short-term option.
- Gradual incorporation of conservation design practices into the city's Planned Unit Development ordinance may be the best way to achieve the city's goals and secure its position over the next 30 years.

## Problem Description and Background

In analyzing the results of annual resident surveys, City of Minnetonka staff determined that residents consistently describe the natural environment as the primary reason for living in Minnetonka (Jo Colleran, personal communication, 10/5/2012). In 2001, the residents affirmed this priority by approving the Open Space Referendum. This meant a property tax increase of \$15,000,000, half of which was to be spent on city park infrastructure and half on the purchase of additional open space. The city established the Natural Environment Team, comprising members of the Community Development and Public Works departments. The City Council charged the Team with this mission: “We will protect and enhance the unique natural environment of our community.” (Minnetonka Action Steps, 2012). Two of the strategies described for fulfilling that mission:

- “Carefully balancing growth and development with preservation efforts that protect the highly valued water and woodland resources of our community.”
- “Developing and implementing realistic long-term plans to mitigate threats to water quality, urban forests, and the unique natural character of Minnetonka.”

Creating the *Distinguished Developments Scoring Sheet* was one of the steps taken by the Natural Environment Team to implement those strategies.

Evidence of the importance of conserving the natural environment to a majority of Minnetonka residents is found in the city staff’s interpretation of resident surveys, in which residents offered their *stated preferences*. Evidence of the residents’ *revealed* preference is provided by the Minnetonka Open Space Referendum, in which they legally obligated themselves to pay for the conservation program. In addition, these preferences were corroborated by the surveys and interviews of developers and homeowners’ association (HOA) officials conducted for this analysis.

The problem stated in the first paragraph potentially affects 4% of the land in Minnetonka, which is all that remains undeveloped (City of Minnetonka, 2012). However, if implemented as a guide for conservation design *retrofits* on properties that have already been developed, a conservation design program---voluntary or mandatory--- has the potential to affect all properties in Minnetonka greater than ½ acre, the minimum for subdivision and building (City of Minnetonka, 2012). The existing conservation policy environment in Minnetonka includes ordinances protecting wetlands, floodplains, shore lands, and certain species of trees. It also includes a planned unit development district ordinance that allows deviation from pre-existing zoning ordinances, especially where this results in energy and land conservation, environmental protection, and low-income housing (Minnetonka Code of Ordinances, 2012). State law requires the city to approve, within 120 days, any development plan that complies with city ordinances and codes (Minnesota Statutes Chapter 462.358). Developers must submit their plans to the city council for approval, and must reach a written agreement with the city, before breaking ground (Susan Thomas, personal communication, 11/2/2012).

The average resident of Minnetonka has a significantly higher income than the average resident of Hennepin County. That resident also pays significantly more to live in Minnetonka and enjoys considerably lower population density (Table 1).

**Table 1.**  
**2010 Census Data**

<b>2010 Census Data</b>	<b>Minnetonka</b>	<b>Hennepin County</b>
Homeownership rate, 2006-2010	73.3%	65.2%
Median value of owner-occupied housing units, 2006-2010	\$323,700	\$247,900
Households, 2006-2010	21,607	473,856
Persons per household, 2006-2010	2.27	2.34
Per capita money income in past 12 months (2010 dollars) 2006-2010	\$47,198	\$35,902
Median household income 2006-2010	\$81,324	\$61,328
Persons below poverty level, percent, 2006-2010	4.0%	12.1%
Persons per square mile, 2010	1,847	2,081.7

Source: United States Census (2010). *State & County Quick Facts*. Retrieved from <http://quickfacts.census.gov/qfd/states/27/2743252.html>

The primary stakeholders in this issue are Minnetonka residents, especially those owning undeveloped properties and those belonging to certain HOAs. Other stakeholders include the city council; the city staff, the Community Development and Public Works departments; and developers.

Owners of undeveloped properties might find the sale value of those properties diminished if additional city ordinances were passed that limit development for conservation reasons. Research indicates that conservation design measures are sometimes a significant departure from business-as-usual for developers and that scoring measurements had the potential to make the development of some sites cost-prohibitive. Annual *City of Minnetonka Resident Study* summaries provide additional evidence of the importance of the problem as described by the clients, as well as insight regarding the potential social acceptability of conservation measures and of the various implementation alternatives.

## Implementation Alternatives Analyzed

- I) **Continue business-as usual (with no use of a conservation design scoring sheet). Rely on existing ordinances and the city's natural resources manager to guide developers.**

This option does not answer the clients' questions directly, but this standard alternative of policy analysis was included as a benchmark for evaluating the other three alternatives.

- II) **Use the current *Distinguished Developments Scoring Sheet* for guidance and evaluation of development plans as a voluntary process with incentives.**

Implementation of Alternative Two would assume that the incentives available to developers would be sufficient motivation for them to include enough conservation design measures to attain a score of 80% or higher on the scoring sheet. An incentive currently approved by the city is a refund of up to the entire \$5000 of the park use fee charged to each developer per lot. Planning department staff indicated that it might be possible to offer expedited processing of development applications for developers who submit initial plans that achieve an 80% score. Public works department staff expressed a keen interest in having the city formally recognize and celebrate developers achieving high scores. The endorsement of the city, in marketing new properties as examples of best practices in conservation development, may indeed provide additional incentive to developers.

- III) **Pass an ordinance requiring a minimum score of 80% on the scoring sheet for initial development plans.**

Alternative three was created under the assumption that a city ordinance would be required in order to enforce the goals described by the clients. It is also assumed that conservation design ordinances already in place in other cities and counties, such as Maple Grove, Plymouth, and Dakota County, are effectively ensuring conservation stewardship over the long run.

- IV) **Tailor the scoring sheet to the unique goals of Minnetonka residents and government. Incorporate scoring sheet measures into city ordinances, requiring a minimum score of 80% ("B") on this scoring sheet for initial development plans. Provide incentives for developers who achieve "A" scores. Offer technical education for conservation design and stewardship to both developers and homeowners' associations.**

Alternative Four is a hybrid of the other alternatives, with the addition of a technical education program in local conservation design policy and practices. Here it is assumed that interested property owners will be aware of the proposed education program if implemented; that enough will participate in order to perpetuate and increase resident interest; that the program will successfully address issues raised by HOA officials and developers during surveys and interviews; and that it will have a positive long term effect on design and stewardship.

## Data, Methods, Evaluation, and Analysis

The following analysis evaluates each alternative using the questions posed at the beginning of this report, and the criteria of economic efficiency, social acceptability, and political acceptability. The analysis also explores the sensitivity of assumptions described above.

### Primary Data

The primary data were gathered in client meetings, email correspondence, phone calls, surveys, and interviews in October and November of 2012. Three HOA officials, four developers, and three past planning commission members were contacted. In addition, an HOA president's wife participated in his interview. Within each category, respondents were given identical question sets initially. Questions were sent via email, and all respondents were given the option of responding in writing, by phone, or in person. Question sets appear in Appendices B, C, and D. All who received the questions responded, except one past planning commission member. The third past planning commission member could not be reached.

### Limitations of the Primary Data

Possible limitations of our primary data include selection bias; response bias; self-reporting; and sampling error.

The names and contact information of all respondents to our surveys and interviews were specified and provided by the clients. Some people were less quick to respond. Some did not respond until prompted once or twice. Others did respond to the survey, or did complete an interview, but did not respond to follow-up questions. Most gave 15 minutes worth of answers on the phone or very short written answers. Two respondents talked for over 90 minutes. One spoke for almost three hours over the course of two telephone interviews.

The sample of HOA officials included three officials and one resident; their statements may not represent a majority of their fellow HOA members---much less all HOA members or all residents of Minnetonka, a city of 50,435 people (US Census, 2010). Selection bias was adjusted for by requesting that the clients provide names of developers who were both highly enthusiastic and highly critical about working with the city government. Response bias was addressed by repeated contacts of those who did not respond.

### Secondary Data

The *Conservation Design Scorecard* was developed in 2010 by 1,000 Friends of Minnesota, a non-profit group for use in new developments throughout Minnesota. (The organization has since changed its name to Envision Minnesota). This scorecard served as the prototype for the City of Minnetonka's *Distinguished Developments Scoring Sheet for Conservation Design*. The original *Scorecard* includes a full description of each measurement with graphics, intended for use as an overhead projection for presentations. The scorecard was created using data from the United States Environmental Protection Agency and other from other states employing conservation design practices. . The Envision Minnesota website further describes the background, creation and use of the scorecard.

The Minnetonka *Scoring Sheet* is an abbreviated and somewhat modified version of the original. It was created in 2012 by the City of Minnetonka Natural Environment Team. The *Action Steps* document describes the mission and strategies to be served by the scoring sheet. These two items comprise the prospective policy analyzed here.



Another important data source is the *City of Minnetonka Residential Study*, which is a series of annual surveys of Minnetonka residents. Among other questions, the survey investigates the residents' reasons for living in Minnetonka. Our analysis used the results of those studies conducted in 2009-2012 by Decision Resources, a Minneapolis market research firm. The president of the company provided the following information: Surveys were conducted by dialing residential phone numbers randomly generated by a computer. Residences were screened for location. In order to avoid leaving out households with only cell phones, Decision Resources procured from the local telephone utility blocks of cell phone numbers---and the receiving tower---used in Minnetonka. A birth date question was asked to establish that each respondent is over 18. The sample size was 400 respondents each year. The survey summaries were provided by the clients. Relevant excerpts appear in the addendum.

Finally, conservation ordinances from the Cities of Maple Grove, Minnetonka, and Plymouth were reviewed for comparison of the proposed scorecard with existing development practices. These were used to evaluate the scoring sheet as compared to practices used elsewhere. Relevant excerpts from Maple Grove and Plymouth appear in the addendum for reference. The City of Minnetonka website also yielded significant information for analysis, such as existing city ordinances relevant to conservation development; governmental processes and structure; and percentage of remaining undeveloped land.

A development evaluation form used by the City of Maple Grove, *The Project Points System* was shared by a developer whose plans were evaluated with it.

Other examples and evidence of common conservation design practices and recommendations were obtained from pages on the websites of the University of Illinois Extension program (2012). This educational material was written by John Church, a regional expert in the field and an extension educator in the Department of Natural Resources Management at the University of Illinois. It was reviewed by another expert, Gerrit Knaap, Associate Professor of Urban and Regional Planning at the University of Illinois. The material contains information commonly found in the regional conservation design literature.

Information on natural open space protection policy, including the social acceptability and funding thereof, was obtained from the website of neighboring Dakota County, Minnesota. The pages describe the county's Farmland and Natural Areas Program (FNAP), an ongoing land conservation program unique in Minnesota that has significant public and government support.

US Census data on Minnetonka and Hennepin County were used to describe social and economic context and to analyze the economic efficiency of alternatives (United States Census, 2010).

#### **Limitations of the Secondary Data**

The *City of Minnetonka Residential Study*, conducted 2009-2012, included the following question each year: "What do you like most about living in Minnetonka?"

The City of Minnetonka Natural Environment Team has determined that the natural environment has been the number one reason for living in Minnetonka for four years running. This conclusion is based on a compilation of the answers given.

In terms of statistical analysis principles, the conclusion is based on a few assumptions. First, it must be assumed that changes to the questions preceding and following this question each year, and changes in the order of questions, had little or no effect on the responses. In addition, the question analyzed here was open-ended, and the totals for nearly identical answers, such as "parks" and "nice parks" were aggregated

as one answer for statistical analysis. For example, in some years, “parks and trails” were aggregated into one answer category; in other years, “parks” and “trails” were totaled separately. The percentage totals for each answer therefore are based on the assumption that these aggregations were accurate representations of what each respondent had in mind.

The conclusion also relies on the assumption that the number one answer in each year, or a collection of answers that would logically fall under the category “natural environment”, is a valid proxy for the concept of natural environment. However, the logic of choice regarding which answers to include in this category is generally sound. For or each year of the study, a very high percentage of residents gave specific answers that, in aggregate, describe the natural environment of Minnetonka. Excerpts of the raw data from the studies appear as Appendix E.

The original *Scorecard* is limited by its implicit applicability to all of Minnesota. Several of its measures fall short of addressing the unique current needs of Minnetonka. For example, several of its “measures” are obviously intended to guide new construction on large tracts of previously undeveloped land, not small parcels contained within existing developments, commonly known as “in-fill” development (Jo Colleran, personal communication, 10/5/2012). This is discussed fully in *Conclusions and Recommendations*.

The *Project Points System* used by the City of Maple Grove and the information on the University of Illinois Extension website allow comparison of the Minnetonka scoring sheet to practices in use elsewhere, as requested by our clients. The Maple Grove system is used for comprehensive evaluation of all development plans and does not include all the conservation design measures on the Minnetonka scoring sheet, so its comparison value is limited. The conservation design information on the University of Illinois Extension website is ostensibly limited by applicability to Illinois. However, the references used in writing that material included the extension services at the universities of Ohio, Wisconsin, and Minnesota (Church, 2012). Furthermore, the practices described are the same as many of the measurements on the original scorecard created by 1,000 Friends of Minnesota and on best practices described in the Minnesota Pollution Control Agency program entitled Green Step Cities (MPCA, 2012).

The Dakota county data refer to a county, not a city. The demographics are not identical. However, like Minnetonka’s residents, the Dakota County population occupies the second-ring suburbs of the same Minneapolis-St. Paul metropolitan area, and the demographics are very similar (2010 US Census, 2011).

## Evaluation

The criterion used for the first tier of evaluation comprised the three questions posed regarding the use of the Distinguished Developments Scoring Sheet for Conservation Design:

- (1) Will the scoring sheet be an effective tool for Minnetonka?
- (2) How does the scoring sheet compare to similar alternatives being used elsewhere?
- (3) What else can we incorporate in order to make the scoring sheet a better tool?

The second tier of evaluation employed three of the traditional criteria used in policy analysis: economic, political, and social acceptability. The creation of two tiers of evaluation was originally intended to narrow the field of implementation alternatives following the rank ordering method and using the clients' questions in aggregate as the first criterion. Both tiers of evaluation were to use the Goeller Scorecard method. However, the primary research and data analysis developed a complex socio-political picture that precluded the easy dismissal of Alternatives II and III based on scores. Although Alternative I had a total score of zero, it was retained for its significance as a benchmark in the second-tier evaluation. Ultimately, the second-tier of evaluation combined elements of the Goeller Scorecard and "non-dominated alternative" methods. All criteria were given equal weight.

### First Tier Evaluation

Scoring for the first tier evaluation process is presented in Table 2 below. Interviews and surveys of two HOA presidents, an HOA board member, an HOA member, and four developers revealed a consistent pattern: half the respondents reported that communication with the natural resources manager is critical to everyone's understanding of requirements and responsibilities regarding conservation design, city conservation ordinances, conservation easement legalities, and stewardship requirements. Several respondents made nearly identical comments indicating that they would be lost without the guidance of the current natural resources manager. Inevitably, the day will come when the current natural resources manager no longer works for the City. In order to prepare for this eventuality, it will be necessary to establish a documented training and education process that will facilitate the continuation of this work.

Alternatives II and III scored significantly lower than Alternative IV (Table 2). Alternative II scored lowest on the first question:

"Will the scoring sheet be an effective tool for Minnetonka?"

This is because there is no way to enforce the goals of the clients with a voluntary measure. Again, state law requires the city to approve within 120 days any development plan that complies with existing city ordinances. (Susan Thomas, personal communication, 11/2/2012; Plymouth City Code, 2012).

Alternatives II, III, and IV compare favorably or very favorably to conservation design policies that are common knowledge in the field. Scoring sheets similar to this one, with similar measures, are being used elsewhere (Church, 2012). In some cases, conservation design and maintenance practices are incorporated into city ordinance. Relevant excerpts from the ordinances of Maple Grove and Plymouth appear As Appendices F and G for reference (City of Maple Grove (undated document); Maple Grove City Code (2012); Plymouth City Code (2012)).

The University of Illinois Extension information on conservation design was based on fact sheets from state university extension programs in Ohio, Wisconsin, and Minnesota, and on residential conservation design ordinances of Kendall County, Illinois. Alternatives III and IV scored higher by comparison, because where desired conservation design measures have been written into city code, they can be enforced, securing the position of the city and its residents. The Minnesota Pollution Control Agency offers detailed advice to city

governments seeking to implement conservation design policies. Its primary message is simple and direct: *“Adopt development ordinances or processes that protect natural systems.”*

Alternative IV scored highest in the first tier evaluation, because it involves further customization of the scoring sheet for Minnetonka. For example, some of the scoring sheet measurements were clearly designed to guide new developments on large tracts of previously undeveloped land. These refer to protecting percentages of the land, connecting open spaces to each other, and clustering buildings (Envision Minnesota, 2011). According to the City of Minnetonka website (2012), the land in Minnetonka is 96% developed, and the remaining 4% is mostly contained within existing developments. For example, in one established development visited during research, there were two single undeveloped lots surrounded by finished houses. The president of the HOA for that development stated that these lots were owned by different individuals. For these and other reasons, modification of the scoring sheet measurements for applicability to in-fill development has the potential to make it a better tool. These modifications will be detailed in *Conclusions and Recommendations*.

## First Tier Evaluation Scoring

**Table 2. First Tier Evaluation: Scoring Based on Client Concerns**

	<b>Client question 1</b>	<b>Client question 2</b>	<b>Client question 3</b>	
<p><b>First Tier Evaluation: Client Concerns</b></p> <p>Will the scoring sheet be an effective tool for Minnetonka?</p> <p>Over the next 30 years:</p> <p>9 for yes 6 for high probability 3 for low probability 0 for no or non-applicable</p>	<p>How does the scoring sheet compare to similar alternatives being used elsewhere?</p> <p>9 for very favorably 6 for favorably 3 for unfavorably 0 for non-applicable or very unfavorably</p>	<p>What else can we incorporate to make the scoring sheet a better tool?</p> <p>9 if little or no change will improve 6 if minor changes will improve 3 if significant changes will improve 0 for non-applicable or requiring extensive change</p>		
<b>Alternatives (abbreviated)</b>				<b>Total</b>
<b>I)</b> Continue business-as usual (with no use of a scoring sheet).	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>II)</b> Use the current scoring sheet as part of a voluntary process with incentives.	<b>3</b>	<b>6</b>	<b>2</b>	<b>11</b>
<b>III)</b> Pass an ordinance requiring a minimum score of 80% on the current scoring sheet for initial development plans.	<b>5</b>	<b>7</b>	<b>3</b>	<b>15</b>
<b>IV)</b> Tailor the scoring sheet for Minnetonka. Incorporate measures into city ordinances, requiring a minimum score of 80% for initial development plans. Provide incentives for higher scores. Offer technical education.	<b>7</b>	<b>9</b>	<b>6</b>	<b>22</b>

## Second Tier Evaluation Analyses

### Economic Efficiency Analysis

Scoring for the second tier evaluation process is presented in Table 3 below. The primary survey data from our clients, HOA officials, and developers are the main source of information regarding benefits and costs, both in dollars and in non-market values, to city government, HOA's, and the general population of landowners (Tables 4 and 5). These data were drawn from statements in meetings and other communications with the clients, interviews and surveys described above, and from the annual city survey of residents. Developer comments on costs and benefits to them were included but not heavily weighted in the scoring (10% of the weight given to the city). As explained above, even if developers owned all the remaining undeveloped property in Minnetonka, developers would represent less than 4% of property owners. None described themselves as residents, and the clients did not believe any were residents. That notwithstanding, their comments regarding costs would be relevant to any resident property owners who wished to sell to a developer.

In discussing the viability of a voluntary program with developer incentives, the clients acknowledged that the monetary incentive of refunding developers the \$5,000 park use fee, as described above, is very small compared to property values. Developers agreed. For example, one developer interviewed stated that one acre-developed lots---ready for building---were selling for about \$100,000-\$400,000 each. Another developer said that processing time for development plans had been a significant issue several years ago, but that in this recessed housing economy, it is nowhere near as important as it once was. Two developers stated that they use the natural features of properties in their marketing. However, it is not known whether public recognition and celebration of developers using conservation design measures would be sufficient incentive to motivate them to develop a property and achieve 80% on the scoring sheet. Further research may assist in identification of more cost-effective and compelling incentives.

For example, three developers surveyed for this analysis indicated that conservation design measures are often a significant departure from business-as-usual and that the scoring sheet had the potential to make development of some sites cost-prohibitive. However, some said that properties with significant natural features, such as woodlands, surface water, and rolling hills, command higher sale prices. One developer pointed out that demand for new housing has been far lower the last few years than it was previously. Despite the reduced demand for housing overall, however, there is greater demand for some lots than for others. All developers said that whether or not the scoring sheet would be cost-prohibitive to development would vary site to site because of differing property characteristics.

One developer protected 4.5 acres of a total 9 acre property by placing it in conservation easement. A primary goal here was to provide the minimum 4 acres of habitat needed by the resident population of scarlet tanagers, members of a charismatic native bird species. In speaking of the protected acreage, the developer said, "I would have developed my property the same way, with or without the ordinances or a scorecard. It just wouldn't have been a conservation easement." This evidence suggests that while developers may be motivated to leave remnant ecosystems intact for reasons of property sale value, they will not necessarily be motivated to protect them in perpetuity without city guidance. And, depending upon the value of the lot in question, even guidance may not be sufficient motivation.

Secondary data from Dakota County's website describing the Farmland and Natural Areas Program (FNAP) refer specifically to funding of \$293,000 from the Minnesota legislature and \$20,000,000 from a county bond referendum that increased property taxes for the program. Several other funding sources are mentioned in very general terms: "Dakota County funds are matched by a variety of federal, state, and

local government money; landowner donations and foundations”(Dakota County, 2012). Such funding could conceivably pay for open space conservation initiatives in Minnetonka as well.

The costs and benefits shown in the tables below were used to assess economic efficiency of the various alternatives. They are abbreviated here for clarity. Detailed descriptions and citations for each item appear elsewhere in the text of this analysis.

## Second Tier Evaluation Scoring

**Table 3. Second Tier Evaluation: Scoring Based on Policy Analysis Criteria**

	<b>Economic Efficiency</b> (for city government and current residents)	<b>Political Acceptability</b> (to the planning commission and city council)	<b>Social Acceptability</b> (to residents, especially Home Owner Associations responsible for stewardship)	
<b>Second Tier Evaluation Policy Analysis Criteria</b>	9 if benefits are likely to far exceed costs 6 if benefits are likely to exceed costs 3 if benefits are likely to equal costs 0 if costs are likely to far exceed benefits	9 for acceptable 6 for high probability 3 for low probability 0 for unacceptable	9 if little or no change will likely improve 6 if minor changes will likely improve 3 if significant changes will likely improve 0 for not acceptable	
<b>Alternatives (abbreviated)</b>				<b>Total</b>
<b>I) Continue business-as usual (with no use of a scoring sheet).</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>10</b>
<b>II) Use the current scoring sheet as part of a voluntary process with incentives.</b>	<b>4</b>	<b>8</b>	<b>3</b>	<b>15</b>
<b>III) Pass an ordinance requiring a minimum score of 80% on the current scoring sheet for initial development plans.</b>	<b>9</b>	<b>3</b>	<b>4</b>	<b>16</b>
<b>IV) Tailor the scoring sheet for Minnetonka. Incorporate measures into city ordinances achieving a given score Provide incentives for higher scores. Offer technical education.</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>22</b>

**Table 4. Potential Benefits and Costs to Developers and Owners of Undeveloped Property** (includes both codification and voluntary program use)

<b>Benefits</b>	<b>Costs</b>
<ul style="list-style-type: none"> <li>✚ Natural features are a selling point in marketing (affirmed by developers) where the natural environment is highly valued</li> <li>✚ Public recognition and celebration of conservation design efforts by the city government as incentive for achieving a given score on the scoring sheet.</li> <li>✚ Credit of city's "Park Use Fee" of \$5,000 per lot as incentive for achieving a given score.</li> <li>✚ Expedited city processing of development plans that achieve a given score as initially submitted</li> <li>✚ If the city chooses to charge conservation development fees to developers as a source of revenue to support design and stewardship efforts, it could refund all or part of these fees as incentive for achieving a given score.</li> </ul>	<ul style="list-style-type: none"> <li>✚ \$4000 per lot to conservation stewardship fund (based on Marshes of Meadow Woods developer fees)</li> <li>✚ Estimated \$938 per lot placed in conservation easement processing costs, if required by city ordinance. Figure based on city costs for recent easement</li> <li>✚ If scoring sheet measurements were written into city code, owners of the remaining 4% undeveloped would lose property rights enjoyed by landowners previously.</li> <li>✚ If the city does charge conservation development fees, this may be an additional cost to developers.</li> <li>✚ <b>Unknown Variables:</b> Two developers commented that costs and barriers would vary from site to site. Both said it was conceivable that the scoring sheet could kill a development in some cases.</li> </ul>



**Table 5. Potential Benefits and Costs to City Residents and Government** (includes both codification and voluntary program use)

Benefits	Costs
<ul style="list-style-type: none"> <li data-bbox="159 218 862 302">✚ If written into city code, scoring sheet measures will guarantee that conservation design and maintenance goals are achieved for the long term, preserving the highly valued “natural environment”.</li> <li data-bbox="159 338 841 394">✚ If the scoring sheet is used as part of a voluntary program, there is still a chance that conservation design and maintenance goals will be achieved.</li> <li data-bbox="159 430 894 541">✚ Evidence strongly suggests that formal public education program on conservation design and stewardship would improve understanding and long-term stewardship. Evidence also suggests that documentation of Ms. Colleran’s work will allow it to be continued into the future.</li> <li data-bbox="159 577 889 634">✚ Conservation design and maintenance may improve property values, given the high value residents of Minnetonka place on natural features.</li> <li data-bbox="159 669 886 747">✚ Dakota county secured many outside sources of funding for open space protection, including, but not limited to, such as the \$293,000 it received from the state legislature</li> </ul>	<ul style="list-style-type: none"> <li data-bbox="971 218 1490 302">✚ Credit to developers of city’s “Park Use Fee” of \$5,000 per lot as incentive for achieving a given score on the scoring sheet.</li> <li data-bbox="971 338 1507 485">✚ Estimated \$938 per lot placed in conservation easement for legal processing costs, based on city figures for land recently placed in easement. This would be a cost either to the city or to an individual homeowner, if not paid in advance by the developer.</li> <li data-bbox="971 520 1500 695">✚ If scoring sheet measurements were written into city code, owners of the remaining 4% of undeveloped land in Minnetonka would lose property rights enjoyed by landowners previously. Conservation measures may reduce property values, and some areas may be barred from development entirely.</li> <li data-bbox="971 730 1507 842">✚ Varying conservation stewardship fees paid by homeowners as part of their HOA fees (e.g., these fees are currently \$500 per home in the Marshes of Meadow Woods development)</li> <li data-bbox="971 877 1500 1024">✚ If the city chooses to use all funds from the Open Space Referendum to purchase land outright, it could prioritize 2.18% of the undeveloped land.<sup>1</sup> Alternatively, the city could prioritize more of the land and offer a cost-share program to property owners.</li> <li data-bbox="971 1060 1507 1318">✚ <b>Unknown Variables:</b> If the Natural Environment Team decides to create an education program, there are many no-cost resources available. However, creation and delivery of such a program will likely also require additional paid staff time. The city might also propose, and residents might approve, another referendum raising money to acquire more land or to reimburse property owners for conservation design retrofits on already-developed land.</li> </ul>

<sup>1</sup> The following calculations estimate the cost to the city of paying current owners of the undeveloped land outright, at market value, to compensate for conserving 2.18% of that land. This assumes that the previously mentioned developer’s typical buildable lot price range of \$100,000-\$400,000 is correct, giving a median lot price of \$250,000. The developer’s estimate appears to be supported by median home values from the 2010 Census in Table 1. The median price is a generous estimate, since not all remaining undeveloped land is necessarily buildable.

**Land area in square miles 26.93 x 640acres per sq mile =17,235 acres**  
**x 2 lots per acre (Minnetonka minimum) =34470 lots**  
**x 4% undeveloped land =1378 possible “lots”**  
**x 250,000 median lot price =\$344,704,000**  
**x 2.18% prioritized for conservation**  
**= \$7,500,000**

### Political Acceptability Analysis

The political will in Minnetonka has been generally perceived, by interviewees and survey respondents, as resistant to codifying more conservation development regulations. The natural resources manager has been consulting with developers individually to encourage, and support with technical assistance, the voluntary use of conservation design measures (Jo Colleran, personal communication, 2012; author's primary research data, 2012). Elsewhere in the metropolitan area, and across the United States, local conservation design policies include various ordinances; voluntary programs employing various conservation design "scorecards"; and on-site consultations from representatives of state agencies (Maple Grove City Code, 2012; Plymouth City Code, 2012; City of Maple Grove, undated; IDNR, 2010).

Interviews and surveys indicated that the political culture in Minnetonka has traditionally been one that places a high value on the property rights of individuals. This suggests that there may be significant resistance to passage of a conservation design ordinance per se.

Past members of the Planning Commission were asked to gauge the likelihood of the City Council approving each alternative, using a scale ranging from zero to nine, with zero being not at all likely, and nine being highly likely. Only one responded, though multiple contact attempts were made. However, the clients' expert opinions of the Planning Commission carry considerable weight, and the principal planner, who advises the Planning Commission directly, agreed to participate in scoring as a proxy. The scores in Table 3 are an average of those given by the past commission member and by the principal planner. The former member of the Planning Commission who responded estimated that there was no chance of the commission recommending alternative four, and a low probability of it recommending alternative three. Given the extremely low response rate, it is difficult to estimate whether the council would be inclined to pass additional ordinances related to conservation in development.

Therefore, information gleaned from meetings, surveys, and interviews comprise the majority of findings derived here. One interviewee's assessment of the position of Minnetonka residents was both representative and illustrative: "People want restrictions on *other* people's property, but not on theirs."

One of the developers interviewed stated that the City of Minnetonka was "generally very anti-development". He described in detail his past difficulties in coming to written agreements with the city regarding the use of conservation design best practices, such as narrower streets with median rain gardens. (Such measures do appear on the new *Scoring Sheet*.) In the developer's view, these design features in his development plan were vetoed unnecessarily by the city's fire marshal, even though the developer had designed the road to accommodate a fire truck. He expressed concern that the scoring sheet would add another layer of complexity to the development approval process, pushing development plans from a simple zoning classification under Minnetonka City Code into a Planned Unit Development (Minnetonka, 2012).

Another developer described both the Planned Unit Development zoning code and the scoring sheet as "too subjective". He added that a voluntary program using the scoring sheet "would not be worth it". The term "subjective" was used frequently by all three developers in interviews.

It is possible that new conservation design measures would discourage development. That notwithstanding, it can also be concluded from interviews that a voluntary conservation design program might be easily dismissed by a developer with title to a few valuable acres. Since state law gives the city 120 days to approve any development application that complies with city code, all that would be necessary to eliminate conservation design measures from a new development would be for one recalcitrant developer to delay submitting revised plans until the 119-day mark (The Office of the Revisor of Statutes, 2012). As long as any development plans were in legal compliance, the council would have no choice but to approve them.

## **Social Acceptability Analysis**

Social acceptability was measured by annual city surveys of residents and by our interviews with officials of HOA's (primarily presidents). The scoring is based on information gathered from these surveys and interviews. The strength of the conclusions is limited, however, by the small sample size previously discussed.

Regarding both social acceptability and long-term effectiveness, three clear patterns emerged. First, acceptability was often closely linked to technical understanding. For example, an HOA president who generally supported conservation design measures was perplexed by a list he was given of species that were deemed suitable for conservation landscaping. He asked in an interview why a very similar cultivar of Black-eyed Susan was not acceptable, when it was, in his opinion, both better-looking and hardier in Minnesota winters than the one on the list. His question was likely rhetorical, but the interviewer responded, giving an explanation of the unpredictable and potentially catastrophic ecological dynamics of introducing alien species. As he was already familiar with the damage that has been caused by alien species that are also invasive, he smiled and said, "That's true." Such anecdotal evidence, along with the glowing comments of developers and homeowners regarding guidance from the natural resources manager, suggests that conservation education has the potential to enhance stewardship commitment among those who support conservation measures but do not fully understand them.

Second, all HOA respondents made it clear that they supported conservation measures and stewardship agreements and that money was in no way a barrier to honoring conservation stewardship agreements. Residents of Minnetonka already pay higher property taxes than the county average (Table 1). Homeowners belonging to HOAs that have conservation stewardship agreements with the city pay additional membership fees to the HOA stewardship fund. These funds are managed by the city and paid out to the HOAs as reimbursement as conservation stewardship work is done.

In the case of one HOA, the original developer was required by his development approval agreement with the city to contribute \$4000 per lot to a conservation stewardship fund for the development. The developer died before completing the project. After purchasing their homes, the homeowners learned that they each had to pay an additional \$4000 to cover the developer's legal commitment. Furthermore, the developer's agreement to surround each home with a conservation easement was translated in one case by the builder into a traditional front lawn with non-native vegetation and a retaining wall, the border of which comes within six feet of the foundation of the home. However, this "conservation easement" is governed by strict laws that prevent homeowners from making changes. Yet even in this extreme case, the homeowners said that they paid willingly and that they strongly supported the conservation goals and measures in general. Another HOA official assured me that compliance with conservation stewardship covenants was something that residents both supported and could easily afford.

The history of nearby Dakota County's FNAP also shows data remarkably similar to that in the problem described by the clients, as well as the City of Minnetonka website, resident surveys, and Open Space Referendum (Dakota County, 2012). As the data come from a neighboring community, they serve to corroborate the Natural Environment Team's assessment of the social acceptability of conservation measures to Minnetonka residents:

*The development of the Farmland and Natural Areas Program started in 1999 in response to citizen concern about the changing Dakota County landscape, primarily due to rapid population growth and associated development.*

*By 1997, only 2–3 percent of the original pre-settlement natural areas still remained in the*

*County. These areas continue to be lost, degraded and fragmented.*

*In the 2001 Dakota County Resident Survey, 96 percent of respondents expressed interest in protecting natural areas and lakes (69 percent said it was very important and 27 percent said it was somewhat important).*

*In 2002, the Trust for Public Land (a private, non-profit organization) conducted an independent poll of Dakota County citizens and found 63 percent of respondents favored a referendum to implement a farmland/natural areas protection program.*

*Dakota County voters approved the referendum by a margin of 57 percent to 43 percent, becoming the first successful countywide open space protection referendum in Minnesota.*

Third, although all respondents indicated that they were aware that the technology to execute and maintain conservation design measures is currently available, five of the eight respondents indicated that they did not know about either the city's conservation design expectations or the existing stewardship agreements when they purchased their properties. Homeowner association officials commonly stated that they often did not fully understand either conservation practices or exactly what was required of them by stewardship covenants. One commented that the HOA covenant was, "all legalese" and that the natural resources manager "has to translate all of it".

Developers also commonly stated that city expectations and requirements were not clear at the outset. One developer---who supported the scoring sheet as a good first step to clarifying city expectations---also stated that working site by site with the natural resources manager made more sense to him than a scoring sheet.

One HOA official pointed to the previously described conservation easement that had been landscaped with retaining walls, cement, and traditional non-native grass and shrubs that were not in conformance with the legally proscribed easement. He said, "The developer may have planned one thing, but then the builder does something else."

The technical feasibility of residential implementation of the scoring sheet was evaluated using data from the interviews and surveys of HOA officials and developers, as well as comparison to commonly employed conservation design practices. However, it was not included in the final scoring as an evaluation criterion.

The HOA officials stated that their lack of technical understanding regarding requirements of the stewardship covenants meant that they had to hire contractors to do the actual work. So while execution and maintenance are technically feasible for someone, they are not technically feasible for the property owners themselves.

Evidence from the interviews suggests that technical education and understanding are key to long-term social acceptability. One developer termed this homeowner "buy-in". He predicted that this will influence compliance and monitoring over the long term, as more and more properties include stewardship agreements and conservation easements.

## Conclusions and Recommendations

The recommendation of this analysis is to implement the most useful elements of each alternative assessed: that is, to *gradually* adopt Alternative IV. This option had the highest total score for both tiers of evaluation (44) and appears to be the best plan for meeting both client goals and conventional policy implementation criteria over the long term. Little data were found during this initial analysis for evaluating political acceptability, so it is uncertain whether either Alternatives III or IV would be feasible in the short term. More extensive political acceptability research is therefore recommended. The implementation of alternative IV would allow the city to start with a voluntary program; to improve public awareness, understanding, and support of the program; and to gradually codify its measures over time, if and when the political will exists.

### Specific Changes to the Scoring Sheet

It is also recommended that changes be made to several of the twenty-three scoring sheet measurements. These changes are intended to clarify the measurement criteria and goals and to improve applicability to the unique circumstances in Minnetonka. The scorecard on which Minnetonka's scoring sheet was based was originally designed for use across the entire state of Minnesota, and some of the measurements apply only to development of large tracts of previously undeveloped land with many potential building sites that are contiguous. As mentioned previously, only 4% of Minnetonka remains undeveloped, and that land is mostly enclosed within existing developments (City of Minnetonka Website, 2012). For the most part, this reality renders some of the *Scoring Sheet* measurements inapplicable to development plans in this city.

In Minnetonka, the preservation of a certain *percentage* of the land may be less effective in meeting goals than the preservation of the *minimum area* required for survival of a remnant ecosystem or high-priority species. On parcels of one or two lots, it may not even be possible to preserve the 20% minimum shown on the scoring sheet. Also, for this measurement, the "percentage protected" ranges do not match the scoring ranges. If this measurement is retained, the number of percentage ranges could be reduced to four: the same number of ranges used in scoring.

Another difficulty in applying the scoring sheet measures to in-fill development of one or more lots is that it may not be possible for *any* of the land left as "open space" to be physically connected to "other public open space". In addition, this connectivity measurement does not specifically refer to conservation easements, some of which are privately owned and some of which are highly restricted in terms of allowable human uses. It may be appropriate to separate this measurement into two or more: one that refers to open space with public access, and one or more referring to private and public conservation easements.

Furthermore, on small parcels, it may not be possible to achieve the following measurement: "Less than 25% of protected property is made up of wetland, floodplain, steep slope, or other 'non-buildable' areas". Similarly, clustering of buildings may also be impossible in an older development where only one or two open lots remain. This measurement could be modified for clarity of expectations. In general, then, where parcels are too small for application of the preservation and connectivity measures described above, it is recommended that the Natural Environment Team eliminate those measures from scoring (and remove their values from total points values for subsections and for final scoring).

Two developers complained that *Scoring Sheet* measures were subjective. One specifically noted the followings measurement: "The type of development is appropriate for the site". This might be clarified by examples of appropriateness in relation to conservation design.

Another measurement gives two points for specific design features of traditional storm water ponds and zero points where those features are absent. If development plans include only rain gardens, tree vaults, and natural swales, no points would be given for this measurement. Since the latter are preferable in terms of established conservation design practices (Church, 2012), it is also recommended that the scoring sheet give two points where traditional storm water ponds are replaced entirely by conservation design methods.

One developer who evaluated the scorecard commented that while a development plan for wetlands may be in compliance with current city code and state law, it still might not score well on the measurements evaluated by the *Scoring Sheet*. This developer also stated that the Minnehaha Watershed District allows 500 square feet of wetland to be taken during development (if justified), while Minnetonka requires mitigation of damage. It is recommended that an attempt be made to resolve these discrepancies on the scoring sheet, in order to make all city expectations fully clear to developers. The city may also consider relaxing some wetland restrictions, as 20% of Minnetonka already comprises preserved wetlands (City of Minnetonka, 2012).

It is also recommended that references to existing Minnetonka codes governing wetlands, floodplains, and tree preservation be added to the *Scoring Sheet*, either as “measurements” or as a separate section. This would render it a comprehensive tool for guiding conservation development plans and technical conservation design education.

Finally, it is recommended that the Scoring Sheet measurements be numbered. This would facilitate communication with anyone who has questions.

### **Implementation**

Analysis of implementation options and feasibility included research and evaluation of the city ordinances of Maple Grove and Plymouth; the comments obtained from a Minnetonka developer; and the conclusions of co-research conducted on this issue. All led to the conclusion that the conservation design measures fit well within Minnetonka’s existing Planned Unit Development (PUD) zoning ordinance (Minnetonka Code of Ordinances, 2012).

Adding explicit descriptions of the scoring sheet measures to city code would remove much of the “subjective” nature of the measurements that was repeatedly pointed out by developers. Requiring only an 80% score for new developments on the scoring sheet items would also allow for variations in site characteristics and in feasibility of compliance from site to site. Alternatively, the PUD ordinance could be rewritten to require that the owners of undeveloped land reach a conservation agreement with the city prior to selling land to a developer. For example, this might take the form of giving the city right of first refusal for purchase of the land. Another option is to put new language in the city’s PUD ordinance requiring developers and city staff to reach an agreement on conservation design measures on a site-by-site basis. This option has the potential to preserve the benefits of property rights, the discretion of city experts, the realistic flexibility, and the spirit of cooperative problem-solving that are characteristic of voluntary programs.

However, due to the uncertainty of political acceptability of codification, the most prudent course of action in the short term is to continue with a voluntary process. Codification of conservation design measures could proceed one at a time, if and when the political will exists.

Similarly, the gradual enforcement of changing codes in Minneapolis may be instructive here. Each time a code change is made, the city makes temporary “grandfather” exceptions for properties and businesses that were in compliance with the old code but are not in compliance with the new code. Each time such a property or business is sold, the new owner is required by the city to change at least one feature that no

longer complies with current code. In this way, all properties can be gradually brought into compliance. However, in the interest of equity, and of accurate property valuation, and of landowner financial realities, it is also recommended that the city consider the affordability of such upgrades to each new property owner and to inform them in advance of purchase.

As mentioned in the *Economic Efficiency* analysis above, neighboring Dakota County has successfully secured funding from a wide variety of sources for its Farmland and Natural Areas Program. Initially, the county planners identified 36,000 acres of priority natural areas for protection. It is recommended that the City of Minnetonka follow the same procedure, using Open Space Referendum funds to permanently protect high-priority land under conservation easements, either by outright purchase of 2.18% of the land or through a cost-share program of co-ownership. The latter would allow for a larger portion of undeveloped land to be prioritized. Though the Neighborhood Match cost share program was previously unsuccessful (Jo Colleran, personal communication, 10/5/2012), it is recommended that the city further research implementation of this common conservation program and incorporate it into a larger education effort described below. Potential social acceptability in Minnetonka is supported by evidence gathered in interviews. One interview question asked HOA presidents to state whether or not they would approve use of the scoring sheet for additional construction within their developments. Regarding subdivision and further development, an HOA president said, "We would do anything in our power to prevent that from happening." Other evidence gathered in meetings and interviews suggest that such an opinion is common among Minnetonka residents. General interest in protecting undeveloped land under conservation easement may be stronger now than in the past, and there are many models across the nation for similar cost-share programs, including those in Minnesota and Illinois (MN DNR, 2012; IDNR, 2012).

Another recommendation for the gradual implementation of Alternative IV is to include incentives to developers and other landowners. These are described above in *The Alternatives* and include incentives currently offered, newly proposed, and yet to be discovered. These and an education program may ameliorate the sting of a new ordinance both politically and socially. As mentioned above, the technical feasibility score was very difficult to pin down. Whether or not feasibility will be improved depends on whether or not the technical education program succeeds in improving understanding of---and interest in---conservation design and stewardship. Understanding the particulars of conservation design and maintenance is a detailed and complicated undertaking. Homeowner Association officials may find that they are content to continue hiring out the work. However, any additional education has high potential for improving resident "buy-in" and interest, as evidenced by interviews.

It is also recommended that the work of the natural resources manager with developers and homeowners be documented and that a technical conservation education program be created. The purpose here is to address a pattern of comments from developers and HOA officials regarding uncertainty and confusion. There are two other staffers qualified to do what the natural resources manager does. However, the primary research data strongly suggest that both developers and homeowners rely heavily on the direction and expertise of one person. Documenting the local biological data, the processes, and the frequently asked questions that are key to understanding conservation design and stewardship, would ensure that the natural resources manager's work can be continued in the future. A public education program may also serve that end.

There are several possible no-cost resources for design and delivery of such a program. The following may be useful for the City of Minnetonka Natural Environment Team, should it choose to create a technical education program. For example, the organization that created the Conservation Design Scorecard (on which Minnetonka's scoring sheet is based) offers volunteer educators who can give presentations to other organizations on the use of their scorecard (Envision Minnesota, 2012).

The team might also appeal to the Minnehaha Creek Watershed District Education Manager, also a former Minnetonka Planning Commission member for program development guidance. Both Minnesota Green Star, and the Energy and Environmental Building Association offer educational programs created for delivery to professionals in all aspects of design and construction, as well as for homeowners, government officials, and others (Minnesota Green Star, 2012; Energy and Environmental Building Association, 2012). Finally, the State of Illinois has an inter-agency program for educating private landowners in conservation stewardship (Illinois DNR, 2012). The Illinois DNR may also be a good resource for best practices in creating and delivering such a public education program.

It is also recommended that the team consider creating internships or fellowships for students working on degrees in environmental or public education. These students could shadow the natural resources manager as she consults with developers and residents, documenting frequently asked questions and the technical conservation information conveyed in these consultations. This could be done independently, or in collaboration with other efforts such as the University of Minnesota Resilient Communities Project, in which the City of Minnetonka already participates.

Finally, the clients helped to define the terms used in the *Scoring Sheet*, as well as the goals stated in the Natural Environment Team's *Action Steps* and other internal documents. Several of the terms have multiple denotations and connotations, and they can mean different things to different people. If the Natural Environment Team discusses the definitions used in describing its conservation mission and vision, and documents these definitions for future use, it may be easier to consistently communicate the goals, intent, and measures of the scoring sheet. The working definitions of these terms appear below.

## **Key Terms in Minnetonka Conservation Design Policy Documentation**

**Ecology:** An environmental system or the study of an environmental system. The balance and interactions of biotic and abiotic elements (flora, fauna, and non-living things) in a functioning ecosystem.

**Conservation:** An act of maintaining something in an unchanged/unaltered condition.

**Preservation:** An act of maintaining something in an unchanged/unaltered condition. In Minnetonka this means holding land, primarily in conservation easement for 30-year terms.

**Protection:** An act of keeping "something" from being damaged or injured through policy; ordinances and codes; and legal agreements for conservation and preservation.

**Restoration:** An act of returning something to its original condition. Though it will not be possible to restore damaged ecosystems to pre-settlement conditions, they can be restored to our best ability. We can control invasive and noxious species. In Minnetonka, restoration is the process of preparing an area such that native species can be replanted.







## Additional Resources for Further Research

Additional local and regional resources for benchmarking, transferrable data, and effective implementation include: Dakota County; the cities of Maple Grove and Plymouth; The Minnehaha Creek Watershed District, Minnesota GreenStar, the Energy & Environmental Building Alliance, the Illinois DNR, The Minnesota Pollution Control Agency, and the extension services at the Universities of Minnesota, Wisconsin, and Illinois.

Since the primary research samples used in this analysis were so small, it is strongly recommended that the City of Minnetonka conduct further research into social and political acceptability of various measures and implementation options. As some of the questions already change year to year, the annual resident surveys would be an excellent vehicle for gaining more extensive and robust data from a sample that has already been scientifically selected.

## References and Citations

### Primary Data Sources (data gathered directly by the author)

-  Meetings and other communications with clients: Jo Colleran, City of Minnetonka Natural Resources Manager, and Susan Thomas, City of Minnetonka Principal Planner
-  Surveys and/or interviews of residential developers who have worked in Minnetonka
-  Surveys and/or interviews of two presidents, a board member, and a regular member of Minnetonka homeowners' associations (HOA's) legally required to execute conservation stewardship agreements
-  Surveys and/or interviews of past members of the Minnetonka Planning Commission

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**Appendix A**  
**City of Minnetonka Distinguished Developments Scoring Sheet**

ECOLOGICAL INTEGRITY OF OPEN SPACE		
Percentage of property permanently protected	> 70%	6 pts for 60% and above 4 pts 40% to 59% 2 pts 20 % to 39%
	60 – 69%	
	50 – 59%	
	40 – 49%	
	30 – 39%	
	20 – 29%	
	< 20%	
Unique features of the property are permanently protected, such as: remnant ecosystems, woodland preservation areas, wetlands, significant topography or areas of historic or cultural value	YES	2 pts for YES
	NO	
Less than 25% of protected property is made up of wetland, floodplain, steep slope or other “non-buildable” area	YES	2 pts for YES
	NO	
NATURAL VALUE OF OPEN SPACE		
Primary and Secondary conservation areas are defined.	YES	2 pts for YES
	NO	
Primary and Secondary conservation areas were defined after consultation with abutting property owners	YES	2 pts for YES
	NO	

Primary and Secondary conservation areas were selected based on consultation with city staff	YES	2 pts for YES
	NO	
No wetland or floodplain areas were altered to facilitate development	YES	2 pts for YES
	NO	
<b>LEGAL PROTECTION OF OPEN SPACE</b>		
A conservation easement is used to protect open space	YES	4 pts for YES
	NO	
A stewardship plan and funding mechanism has been adopted	YES	4 pts for YES
	NO	
Boundaries of open space are well-defined through the use of survey markers or sign and can be readily identified in the field	YES	4 pts for YES
	NO	
<b>CONNECTIVITY OF OPEN SPACE</b>		
Percent of open space physically connected to other public open space	100%	6 pts for 80% and above 4 pts 50% to 79% 2 pts 30 % to 49%
	90 – 99%	
	80 – 89%	
	70 – 79%	
	60 – 69%	

	50 – 59%	
	40 – 49%	
	30 – 39%	

<b>SECTION I SUBTOTAL :</b>	
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**SITE DESIGN**

**GENERAL STANDARDS**

The type of development is appropriate for the site.	YES	2 pts for YES
	NO	
Structures and infrastructure area located to minimize overall site impact	YES	2 pts for YES
	NO	
Grading is minimized to reduce impact to natural features, including lakes, creeks, wetlands, and floodplain	YES	2 pts for YES
	NO	

**STRUCTURES**

Structures are clustered on the site	YES	2 pts for YES
	NO	
Grading is limited to no more than 30 feet from structures	YES	2 pts for YES
	NO	
	YES	2 pts for YES

Minimum levels of green building performance are achieved.	NO	
<b>ROADS AND PARKING</b>		
The width of roads is appropriate for anticipated traffic volume and speed	YES	2 pts for YES
	NO	
The width and length of driveways is minimized	YES	2 pts for YES
	NO	
Curb and gutter alternatives are used where appropriate	YES	2 pts for YES
	NO	
<b>STORMWATER</b>		
Low-Impact Design principals are included, such as rain gardens, cisterns, and natural swales	YES	2 pts for YES
	NO	
Traditional stormwater ponds are well-designed, including cleanout forebays and vegetated shelves	YES	2 pts for YES
	NO	
Impervious surface on individual properties is restricted to less than city code would allow	YES	2 pts for YES
	NO	
<b>SECTION II SUBTOTAL:</b>		

---

SECTION I SUBTOTAL x 2 =	
SECTION II SUBTOTAL x 1=	
<b>TOTAL SCORE</b>	

**TOTAL POINTS**

**LETTER GRADE**

90 to 100

A

80 to 89

B

70 to 79

C

60 to 69

D

## Appendix B

### Conservation Design Interview/Questionnaire for Minnetonka Developers

1. What are the features that make Minnetonka properties desirable to buyers? Do you use these in your advertising/marketing materials?
2. What else motivates you to work in Minnetonka?
3. What challenges do you face in working in Minnetonka?
4. If you could change anything in the process of developing a property in Minnetonka (or in general), what would it be?
5. What, if anything, do you like about the conservation design scorecard, and why?
6. Do you see anything in the scorecard that conflicts with existing codes, regulations, or best practices?
7. Is there any measurement on the scorecard that may be difficult or impossible for you to execute for other reasons?
8. Can you estimate the additional costs to you of achieving an 80% score on various Minnetonka properties, as opposed to current costs (complying only with existing codes and regulations and meeting buyer demands for property characteristics)?
9. Do you currently take advantage of the City of Minnetonka Living Legacy Fund as reimbursement for protecting undeveloped land with conservation easement status? Why or why not?
10. Do you have any other comments on the Conservation Design Scorecard?
11. Can you refer us to other developers who work in Minnetonka? (We have already contacted XX, XX, and XX.)\*

\*Respondent names are held in confidence.



## Appendix C

### Conservation Design Interview/Questionnaire for Minnetonka Homeowners' Associations (HOAs)

1. Does your HOA currently follow a plan for conservation stewardship or restoration?
2. If yes, please tell us about your experiences with it and indicate whether or not you receive stewardship funding from the City of Minnetonka.
3. If not, please tell us why not---and whether or not you would like to participate in one.
4. Please consider a hypothetical scenario: A subdivision is being developed within the area governed by your HOA. The conservation design features described on the Distinguished Developments Scoring Sheet will be implemented, and it will be the responsibility of your HOA to maintain those features. Would it be feasible, given your current levels of expertise, technology, and funding?
5. If not, what barriers do you envision? What else would you need?
6. To the best of your knowledge, would your HOA be interested in implementing any of the conservation design measures on the scoring sheet at properties that are *not* being subdivided for further development?
7. Why or why not?
8. Do you have any other questions or comments on the use of the scoring sheet to guide new developments in Minnetonka?
12. Can you refer us to other Minnetonka HOAs? (We have already contacted XX, XX, and XX.)\*

\*Respondent names are held in confidence.

## Appendix D

### City of Minnetonka Residential Studies Excerpts (Raw Data and “Natural Environment” Answer Synthesis Calculations)

City of Minnetonka  
2009 Residential Study  
FINAL FEBRUARY 2009

Excerpt begins here

4. What do you like most about living in Minnetonka?

HOUSING, 3%; NEIGHBORHOOD, 4%; LAKE, 12%; CLOSE TO WORK, 5%; SCHOOLS, 9%; SHOPPING, 8%; OPEN SPACE, 4%; PARKS AND TRAILS, 7%; NATURAL BEAUTY, 8%; QUIET AND PEACEFUL, 6%; CONVENIENT LOCATION, 9%; SMALL TOWN FEEL, 4%; FRIENDLY PEOPLE, 8%; SAFE, 7%; WELL-MAINTAINED, 3%; SCATTERED, 2%.

Excerpt ends here.

#### 2009 “Natural Environment” calculation:

#1 = Lake 12%

#3 = Natural Beauty (tied with Friendly people) 8%

#4 = Parks and Trails (tied with Safe) 7%

#6 = Open Space (tied with Neighborhood and Small Town Feel) 4%

Total = 19% = assumed new #1 for “Natural Environment”

.....  
City of Minnetonka  
2010 Residential Study  
FINAL FEBRUARY 2010

Excerpt begins here.

3. What do you like most about living in Minnetonka?

HOUSING/LOTS, 2%; NEIGHBORHOOD, 6%; CLOSE TO JOB, 2%; CLOSE TO FAMILY AND FRIENDS, 7%; SCHOOLS, 13%; SAFE, 4%; OPEN SPACES, 22%; LAKE, 5%; QUIET AND PEACEFUL, 5%; FRIENDLY PEOPLE, 6%; CONVENIENT LOCATION, 5%; WELL-MAINTAINED, 2%; GOOD CITY SERVICES, 6%; PARKS AND TRAILS, 9%; SHOPPING, 5%; SCATTERED, 2%.

Excerpt ends here.

#### 2010 “Natural Environment” calculation:

#1 = OPEN SPACES, 22%

# 2 = PARKS AND TRAILS, 9%

# 5 = LAKE (tied with Quiet and Peaceful, Convenient Location, and Shopping), 5%

Total = 36% = assumed new #1 for "Natural Environment"

.....

City of Minnetonka  
2011 Residential Study  
FINAL FEBRUARY 2011

Excerpt begins here.

. What do you like most about living in Minnetonka?

UNSURE, 1%; FRIENDLY PEOPLE, 10%; SAFE, 6%; OPEN SPACES, 7%; PARKS, 6%; SCHOOLS, 10%; CITY SERVICES, 8%; TREES/NATURE, 10%; TRAILS, 3%; THE LAKE, 4%; LOCATION, 12%; HOUSING/NEIGHBORHOOD, 9%; QUIET, 6%; SHOPPING, 8%

Excerpt ends here.

City of Minnetonka  
2012 Residential Study  
FINAL FEBRUARY 2012

Excerpt begins here.

4. What do you like most about living in Minnetonka?

UNSURE.....1%  
FRIENDLY PEOPLE.....15%  
SAFE.....6%  
OPEN SPACES.....16%  
PARKS.....5%  
SCHOOLS.....10%  
CITY SERVICES.....2%  
TREES/NATURE.....12%  
TRAILS.....2%  
THE LAKE.....4%  
LOCATION.....12%  
QUIET.....10%  
SHOPPING.....4%  
HOUSING/NEIGHBORHOOD...2%

Excerpt ends here.

## Appendix E

### **Plymouth City Code 500.01** **CHAPTER V** **SUBDIVISION REGULATIONS** **Section 500 - Title and Application**

500.01. Title. This Chapter shall be known as the “Plymouth Subdivision Regulations” except as referred to herein, where it shall be referred to as “this Chapter”.

500.03. Intent and Purpose. The intent of this Chapter is to protect and provide for the public health, safety, morals, and general welfare of the City and its people, and specifically to achieve the following purposes:

...E. To encourage the wise use and management of land and natural resources throughout the City in order to preserve the integrity, stability, and natural beauty of the community;

...  
J. To assure that new subdivisions will contribute toward an attractive, orderly, stable, livable, and safe community.

### **Plymouth City Code 502.01** **Section 502 - Rules and Definitions**

...B. Disturbance Zone: Any area which would be physically altered from its natural state, including but not limited to all areas of grading, utility installation, building pads, driveways, or parking areas.

C. Natural Preserve: Publicly owned lands designated as park or open space or private properties approved by the City which are set aside to preserve their natural characteristics and qualities pursuant to Section 811 of the City Code.

D. Protected, Preserved, or Undisturbed Tree: Any tree with at least 75% of its critical root zone left undisturbed, and which has been protected during the construction process by tree protection fencing if its trunk is located within 15 feet of any disturbance zone.

E. Significant Tree: Any healthy tree measuring eight inches in diameter or larger at a height of 54 inches above ground for deciduous trees, and measuring four inches in diameter or larger at a distance of 54 inches above ground for coniferous trees.

F. Tree Inch: An inch in the diameter of a significant tree....

### **Plymouth City Code 508.01, Subd. 6(a)**

Subd. 6. Lack of Adequate Drainage.

A proposed subdivision may be deemed premature if:

A. Surface or subsurface water retention and runoff is such that it constitutes a hazard to the stability of proposed or existing structures; or

B. The proposed subdivision would cause pollution of water sources or would cause damage from erosion or siltation on downstream property; or

C. Factors including, but not limited to, the presence of floodplain, poor soils or subsoils, or steep slopes exist in such a manner as to preclude adequate site drainage or treatment of runoff.

Subd. 7. Inconsistent with Environmental Requirements.

A proposed subdivision may be deemed premature if it is inconsistent with the rules and policies of the Minnesota Environmental Quality Board, as may be amended, and could adversely impact critical environmental areas, or

potentially disrupt or destroy, in violation of State historical preservation laws, historic areas which are designated or officially recognized by the Council.  
(Ord. 2003-15, 6/10/2003; Ord. 2011-29, 10/25/2011)

**Plymouth City Code 510.01**  
**Section 510 - Preliminary Plat**

510.01. Preliminary Plat Procedure. Pursuant to Minnesota Statutes, Chapter 462.358, an application for a preliminary plat shall be approved or denied within 120 days from the date of its official and complete submission unless extended pursuant to Statute or a time waiver is granted by the subdivider.

**..... Subd. 4. Planning Commission Consideration.**

The Planning Commission shall consider a preliminary plat application, as follows:

A. The Planning Commission shall review the preliminary plat and conduct the official public hearing.

B. The subdivider or representatives thereof may appear before the Planning Commission to present information and answer questions concerning the proposal.

C. The Planning Commission and staff shall have the authority to request additional information from the subdivider concerning the proposal, as deemed necessary to formulate a recommendation on the proposal.

D. The Planning Commission shall recommend approval of the preliminary plat if it in all ways conforms with the City's Comprehensive Plan, Zoning Ordinance, this Chapter and all Chapters of the City Code. The Commission shall recommend denial of the preliminary plat if it makes any of the following findings:

...3. That the physical characteristics of the site, including but not limited to topography, vegetation, susceptibility to erosion and siltation, susceptibility to flooding, water storage, and retention, are such that the site is not suitable for the type of development or use contemplated.

4. That the site is not physically suitable for the intensity or type of development or use contemplated.

5. That the design of the subdivision or the proposed improvements are likely to cause substantial and irreversible environmental damage.

6. That the design of the subdivision or the type of improvements will be detrimental to the health, safety, or general welfare of the public...

**Subd. 6. Drawings, Existing Conditions.**

The application form shall be accompanied by drawings and information indicating the following:

...F. Topography in two-foot contour intervals within the proposed plat, and to a distance of 100 feet beyond the boundary lines of such plat.

G. Water courses, wetlands, marshes, wooded areas, rock outcrops, power transmission poles and lines, and other significant features within the proposed plat, and to a distance of 100 feet beyond the boundary lines of such plat.

H. Boundary lines and ownership of all adjoining land within 100 feet.

...J. Tree inventory indicating the location, size, and species of all significant trees existing within the proposed plat, and to a distance of 15 feet beyond the boundary lines of such plat. The inventory shall also include a tabular listing of all such trees.

K. Soil borings and percolation tests, as may be required by the Building

Official or City Engineer.

**Plymouth City Code 510.03, Subd. 7**

...B. Preliminary grading and erosion control plan for the proposed plat, including the following:

- ...3. Location of all existing natural features on the tract including, but not limited to, tree lines, wetlands, ponds, lakes, streams, drainage channels, bluffs, steep slopes, etc.
4. Location of all existing and proposed storm sewer facilities, including pipes, manholes, catch basins, ponds, swales, and drainage channels within 100 feet of the proposed plat. Pipe type and size, pipe grades, rim and invert elevations, and normal high water elevations shall be included.
5. Flood elevations and locations if the plat is located within, or adjacent to, a 100-year flood plain.
6. Spot elevations at drainage break points and directional arrows indicating site and swale drainage.
7. Locations, grades, and rim invert elevations of all storm sewer facilities, including ponds, proposed to serve the plat.
8. Locations and elevations of all street high and low points.
9. Street grades.
10. Phasing of grading.
11. Location of all easements, including oversize or non-typical easements.
12. An erosion control plan, pursuant to Section 526 of this Chapter.

<http://library.municode.com/index.aspx?clientId=13556>

## Appendix F

### Subdivision Ordinance of the City of Maple Grove

#### Sec. 30-1. - Title.

This chapter shall be known as the "Subdivision Ordinance of the City of Maple Grove."

#### Sec. 30-11. - Premature subdivisions.

(a)

Any proposed subdivision requiring council approval pursuant to this chapter and deemed premature for development shall not be approved by the city council. A subdivision shall be deemed premature if, in the council's opinion, any of the following conditions exist:

(1)

##### *Lack of adequate drainage.*

a.

A proposed subdivision shall be deemed to lack adequate drainage to serve the subdivision when:

1.

Surface or subsurface water retention and runoff is such that it constitutes a hazard to the stability of proposed structures;

2.

The proposed subdivision will cause pollution of water sources or surrounding damage from erosion and siltation on downhill or downstream land; or

3.

The proposed site grading and development will cause harmful and irreparable damage from erosion and siltation on downhill or downstream land.

b.

In making these determinations, the planning commission and city council shall consider such factors as the average rainfall for the area, the relation of the land to floodplains, the nature of soils and subsoils and the slope of the land and their ability to adequately support surface water runoff and structures, the presence of streams, and compliance with or ability to comply with [chapter 14](#), article IV (end of excerpt)

Sec. 30-17. - Design standards for preliminary and final plats.

(excerpt begins here)

...f.

*Watercourses.* Lots abutting a watercourse, drainageway, channel or stream shall have additional depth and width, as required under the provisions of [chapter 36](#) for the floodplain, shoreland and wetland systems districts.

g.

*Preservation of special features.* In the subdividing of any land, due regard shall be shown for all natural features, such as trees, wetlands, watercourses, historic sites or similar conditions which if preserved will add attractiveness and stability to the proposed development.

h.

*Lot remnants.* All remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allowed to remain as separate parcels or platted as outlots.

(end of excerpt)

## Chapter 14 - ENVIRONMENT <sup>[35]</sup>

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[ARTICLE I. - IN GENERAL](#)

[ARTICLE II. - NUISANCES](#)

[ARTICLE III. - DUTCH ELM DISEASE](#)

[ARTICLE IV. - EROSION AND SEDIMENT CONTROL](#)

[ARTICLE V. - EXCAVATIONS, MINING AND GRAVEL PITS](#)

[ARTICLE VI. - WETLAND CONSERVATION ACT](#)

### Sec. 14-191. - Title; purpose; scope.

(a)

This article shall be known as the "**Maple Grove Grading, Erosion and Sediment Control Ordinance**" and may be so cited.

(b)

The purpose of this article is to safeguard property, and to preserve and enhance the natural environment, including, but not limited to, water quality, by regulating clearing and grading on public and private property.

(c)

This article sets forth rules and regulations to control land disturbances, land fill, soil storage, and erosion and sedimentation resulting from such activities and establishes procedures for issuance, administration and enforcement of a permit. Unless otherwise specifically provided in this article or elsewhere in this Code, this article does not apply to the activities regulated by article V of this chapter.

(Code 1984, § 441:00)