Preserving Minnesota Landscapes Through Creative Development

An Introduction
Dear Reader:

This Conservation Design Portfolio was inspired by the many great people throughout Minnesota who are working to build quality communities. Designers, developers, local officials and resource professionals are just a few of the people dedicated to preserving our state’s wonderful natural and cultural features as our communities grow and change. The Minnesota Land Trust has been working with many of these groups over the past several years through the Conservation-Based Development Program. This program has promoted conservation approaches to development through direct design assistance as well as education to local communities.

Throughout the Program, we have been encouraged by the profound interest in conservation planning and design. We also have understood many of the frustrations in changing long-held development patterns and traditions. We hope that this Portfolio will assist those of you working at the local level to preserve unique natural areas, scenic views or other features of importance to the community. The examples provided in this Portfolio will hopefully stimulate the imagination and encourage exploration of innovative approaches to development.

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We hope you enjoy the Portfolio and wish you luck in your conservation design pursuits.

Sincerely,

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This Conservation Design Portfolio has been developed by the Minnesota Land Trust and the University of Minnesota. It was created in response to growing concerns over impacts from land development on Minnesota's natural and cultural resources. The Portfolio is intended to showcase new residential developments that were specifically designed to minimize impacts on the lands and waters that surround them and to positively contribute to the character of the greater community.

The Portfolio was designed for a wide audience, including local elected officials, developers, city planning staff and consultants. Many of these stakeholders in the land development process have been working with various planning tools to improve how new developments look and function. One such tool is conservation design. Conservation design is the process by which the most ecologically or culturally significant areas of the property are first identified and set aside in preservation areas. Then, buildings, roads and other infrastructure are designed on the least-sensitive areas of the property. The result is a built work that profitably combines development and common open space (often 50% of the site or more) which benefits both the development’s residents and the greater community. We will refer to the finished project as a conservation development and the process of creating it as conservation design.

The Minnesota Land Trust and many other organizations have been working with communities and developers around the state to create more conservation-oriented developments. There are now at least 20 recent conservation developments in Minnesota, and the number of projects is growing rapidly. They can be found as far north as Cook County and as far south as the city of La Crescent, with a big concentration in the Twin Cities metro area. In addition, at least 14 different communities have passed conservation development related ordinances.

This Portfolio features some of the more successful conservation developments in a series of Case Studies that are printed as loose four-page project sheets. These Case Studies feature both built works and those in various planning stages here in Minnesota. They were selected to demonstrate a diversity of conservation intent, housing markets, size and location. In addition, this Introduction is intended as a brief primer on some of the lessons we have learned in this effort. These lessons include:

- **Conservation design is not a panacea**
  It is only one of the many strategies needed to address the impacts of conventional development.

- **Setting goals in the community’s planning framework is critical**
  Just as we need “smart growth” we also need “smart conservation.” A comprehensive plan should set sound conservation goals and means of achieving them.

- **It is important to have good resource information**
  Resource inventories are essential to determining protection priorities, such as critical habitats, scenic views or water resources.
• **Think big and plan for a larger open space network**
Inventories can help establish a larger green infrastructure for the community by identifying corridors or greenways that connect important community features.

• **Ordinances should create incentives and reduce barriers**
Ordinances should help create incentives for good conservation and at a minimum reduce many of the existing barriers to flexibility and creativity.

• **Open space should be diligently designed, not just set aside**
Preservation areas should not be isolated fragments. They should protect the specific conservation values of the property and relate to the streets and lots in such a way as to be easily identified and appreciated.

• **Water quality and quantity is paramount**
One of the greatest impacts of conventional development is on our state’s rich water resources. Conservation design can successfully help prevent and mitigate these impacts through an array of techniques.

• **The management of the protected areas is critical**
Whether owned by a homeowners association or other entity, ensuring the ongoing viability of the open space’s conservation values is of critical concern.

• **Conservation developments must be profitable**
Developers and realtors must be able to market the conservation vision to future homebuyers. Fortunately, homebuyers have thus far supported conservation developments at rates and prices that have exceeded expectations.

• **Many of the barriers to change are not technical, but institutional**
Putting conservation design into action requires a shift in many long-held institutional beliefs. Changing these beliefs requires one dedicated person – an agent of change – to be the guiding force behind the effort.

We hope that this Portfolio will encourage readers to be an agent of change and explore opportunities for conservation developments in their area. In the end, we hope that the list of successful conservation developments will continue to expand, building new Minnesota communities that respect our great natural and cultural heritage.
WHAT ARE THE BENEFITS OF PRESERVING NATURAL AREAS?

Although Minnesota is often thought of as a state of natural wonders, it is surprising how little remains of some of our native ecosystems. According to the Minnesota Department of Natural Resources, approximately two percent of the original maple/basswood Big Woods forest, one percent of the complex prairie ecosystems and 40 percent of our original wetland cover remain. Even in northern Minnesota, where it seems the woodlands are endless, the vast forest cover has been altered through logging and development. As a result, there are fewer areas of true high quality, diverse natural land cover. Many of these resources are on private lands, which makes their future uncertain. Seventy-five percent of the Big Woods, approximately 70 percent of the remaining prairie and more than 65 percent of the state’s lakeshore are privately owned.

Quality natural areas contribute to biodiversity and are essential in maintaining a healthy ecosystem and wildlife population. In addition, they help keep many of our human systems viable. For example, a community’s natural features can help keep current residents or attract new ones. It is also an engine that helps drive the tourism industry. In addition, property values are generally higher when the property contains substantial natural areas or is adjacent to them, which can contribute to a greater tax base. Forests or other natural areas can provide places for relaxation and contribute to the overall character of a community. They can help screen or buffer incompatible land uses and create a sense of privacy. Finally, our natural areas contribute on a larger scale to clean air and water.

Maintaining healthy natural areas in conventional large-lot development can be difficult. Five- or 10-acre lots are often too large to mow, yet too small to effectively manage as a natural area. For example, a forest that is fragmented among eight or 10 different landowners is much more difficult to manage than one that is under single ownership. This is true even if all of the landowners agreed that they want to preserve the forest, which is often unlikely.

HOW DO OUR LAKES AND RIVERS BENEFIT FROM A CONSERVATION APPROACH?

According to the United States Environmental Protection Agency, polluted runoff is the number one threat to water quality. In urbanizing areas, this runoff increasingly comes from new developments. If we could do one thing to improve the performance of new development, it might be to address its impact on the state’s rich freshwater systems.

Development’s impact to water resources comes in four main categories:

• **Stormwater runoff**
  The impervious surfaces within developments – the pavement and rooftops – generates substantial stormwater runoff. This runoff contributes to flooding and erosion. Because soils are heavily compacted during construction, even turf grass lawns – one of our
nation’s largest crops — generate substantial stormwater runoff. In addition, lawn chemicals, motor oils and nutrients such as fertilizers are carried with this stormwater and dumped into receiving waters.

Many of the surfaces we create in developments can negatively impact water quality and quantity

- **Alteration of hydrology**
  Before development, much of the rain falling on a vegetated site may be intercepted by vegetation and evaporated. Much of it never even reaches the ground. Rainfall that passes through the vegetation may be taken up through the root systems, infiltrated into the groundwater, or slowly run off into shallow wet areas. On a developed site, the rainwater falls to the site directly with no interception. It is not recharged back into the water table, but is instead sent off site as quickly as possible through an elaborate system of curbs, gutters, pipes and ponds. Most stormwater regulations currently only control rates of runoff in order to address flooding concerns. They do not control for the overall volume of water leaving the site or the impacts on receiving waters, such as streams or wetlands.

- **Wastewater discharge**
  Handling wastewater treatment of new development near shorelines is another serious water quality issue; many older septic systems along lakes have historically failed due to poor design, poor maintenance or inadequate soils.

- **Disturbance of riparian habitat**
  Many developments along lakes and rivers strip the shorelines of vegetation, both on land and under water. These riparian edges represent a critically dynamic area: they provide habitat for a host of fish, wildlife, and insect populations; they help maintain appropriate temperatures; and they provide food.

In addition to these environmental issues, the character and quality of our waters is also a major economic force for much of the state. Our lakes and rivers help drive much of the state’s tourist economy and attract an increasing number of new or seasonal residents. These residents are increasingly concerned about the quality and quantity of our water resources. Recent surveys of residents in Washington and Chisago counties, for example, highlighted water-related issues as one of the major concerns of residents and a primary contributor to their quality of life. As we’ll see later, one of the best strategies to protect water resources in new developments is to utilize conservation design techniques.

**WHAT IS THE VALUE OF OUR SCENIC AND RURAL LANDSCAPES?**

One of the more noticeable changes in growing communities is the loss of rural character and scenic views. There are also substantial concerns related to the
economic base of the community itself. These concerns extend beyond the simple conversion of a specific farm field or forest stand. As densities increase in any given area, new residents often begin objecting to the noises and smells associated with rural industries, such as farming or logging. Once land ownership is conveyed into smaller and smaller parcels throughout an area, the viability of maintaining an active farm economy is lost. The preservation of active agriculture or forestry is a complex issue involving international trade and many other factors. The preservation of a land base for farming or forestry, however, is a local issue which some forms of conservation design can help address.

The benefits of preserving a rural landscape extend throughout the larger region. There can be substantial social and economic impacts in some communities if their rural heritage is lost or if scenic views are severely impacted. Tourism and the real estate market are just a few of the many industries that benefit from the visual qualities of open space. Increased property values resulting from being adjacent to open space can help increase the local tax base. Meanwhile, residents in rural areas enjoy the clean air and water and the intangible psychological benefits of views of the rural landscape.

**HOW DO ALL OF THESE BENEFITS CONTRIBUTE TO A BETTER QUALITY OF LIFE?**

Many residents in growing communities cite visual and physical access to open space as one of the important components in their daily lives. In a 1996 Department of Natural Resources survey, the environment was among the top three factors that Minnesotans associated with quality of life. Clean air and water, the potential for recreation and visual relief are all considered valuable attributes of open space.

Many developing communities do not place a high emphasis on the natural and cultural features that surround them. Instead, they compromise their unique qualities and sense of place in the rush to keep up with housing demands. Features common to small towns, such as walkable neighborhoods and access to open space and parks, are quite popular with homebuyers. These features are often not incorporated into new developments. In addition, new developments often do not take advantage of the special attributes of rural areas, such as rolling meadows or woodland trails. Conservation design is one strategy to address both the need to create quality communities and to preserve specific resources.

(top left) Many people are attracted to the quality of life in rural settings (right) Others prefer living in a small town or urban neighborhood with walkable streets (bottom left) However, in newer auto-oriented communities, many of these qualities are compromised. For example, walking through new development is sometimes not only difficult, but illegal.
WHAT IS CONSERVATION DESIGN?

In its simplest form, conservation design is a broad term for the process of developing a particular parcel of land in a manner that respects the site’s natural and cultural features. It usually addresses new residential developments in rural or suburban settings. This process first asks questions about specific features of value to the community. For example, are there mature woodlands on the site worth protecting? Are there trout streams or native prairie? Is the development within an important scenic viewshed? Then, the buildings, roads and lots are arranged in such a manner to protect these resources and to minimize the overall impact of the development to the site itself and to the greater community.

The result? Often, land is set aside in permanent open space (frequently between 40 and 80% of the site). This open space protects or restores the identified conservation values and provides the residents with a common area for their enjoyment. “Golf course development without the golf course” is how conservation design is often described. And just as good golf courses are laid out with impeccable attention to their form and function, good open space design requires a similar seriousness of purpose, albeit for vastly different conservation and community purposes.

Conservation design is not an entirely new nor complex concept. In the 1960s and 1970s, developments like Keya Paha in Rice County and Jonathon in Chaska tested the feasibility of protecting lakeshore and other natural features for all the residents to enjoy, rather than parceling it off for the exclusive appreciation of a few homeowners. Unfortunately, many of these innovative approaches were sidelined in subsequent building booms and busts. Now, however, there is a new resurgence in alternative development patterns.

There are many names and variations of conservation design: Cluster Development, Cluster Design, Open Space Development, Conservation-Based Development, Growing Greener and others. These terms have some differences, but by and large all of these concepts are attempts to improve how we develop land. Because conservation developments are occurring in places with unique political contexts and housing markets, comparing them can sometimes be quite difficult. Therefore, conservation design is perhaps best thought of as a process, rather than a standard product. In fact, one of the primary differences in this approach from conventional platting is that the ecological and cultural context for the development should help direct the design. This should result in different goals and thus different development outcomes.

There is a growing variety of definitions and materials related to conservation design.

Developments that started in the 1970s, such as Keya Paha, set precedents for preserving common areas and lakeshore buffers.
WHAT TYPES OF CONSERVATION DEVELOPMENTS ARE THERE?

Conservation developments are as varied as the landscapes and communities in which they sit. Their differences are largely a function of the community's development goals, the developer's economic goals and the conservation context of the property. The following series of graphics illustrates how conservation can be taken into account regardless of the intended future development use of the property. Set in a relatively typical landscape in Minnesota, these graphics walk through a series of different densities and uses for the property. Notice that while the form of the development looks different as densities increase, much of the conservation intent remains the same.

The first graphic below displays a representative landscape throughout much of the state. This 80-acre parcel has a number of important characteristics: scenic views of farmland and the original farmstead cluster of buildings; a mature remnant woodland area that is habitat for a wide variety of animals and song birds; and lake shoreline with undisturbed vegetation that has become a nesting ground for waterfowl. These features collectively make up the property's conservation values.

In many areas of the state, rural residential zoning would permit one house per five acres of land. The resulting development often does little to recognize these pre-existing features. The farmland and farmstead are lost to houses and streets, the woodland is cut down, each lot utilizes individual septic systems and the shoreline habitat is replaced with docks and turf grass. While many of these newly-created lots would make nice home sites, this 5-acre development has lost an opportunity to both protect important resources and provide common amenities to future homebuyers, such as preserved shorelines or trails.

Now, depending on what the overall goals of the community and landowner are, there are different conservation approaches that might be appropriate for this tract of land.

HOW WOULD CONSERVATION DESIGN FUNCTION IN A RURAL SETTING?

In many cases, landowners desire to keep farming, logging or otherwise using their land. They also desire to preserve its natural features. However, they often wish or need to derive some income from the sale of several lots. This scenario is quite common, as many landowners do not wish to fully develop their property. The land, however, is their only real asset for retirement or other future financial needs. This is an opportunity for Limited Rural Development.

Many zoning ordinances in rural settings require that land be broken up into 5-, 10- or 20-acre parcels, which makes continued farming or forest management difficult. With limited development, the areas most appropriate to keep in open space are identified first. In this case, the farmland, forest, and lakeshore areas are left largely intact and will be owned by the original landowner. Three smaller lots are located in areas that least impact this larger landscape, while still providing great

28 acres woodland, 12 acres surface water, 40 acres farmland

Conventional Development: 15 lots with 5 acres minimum per lot
marketability. Then, a conservation easement is placed over the larger area to ensure its future protection. The original landowner wins by having both income and the use of his or her property, while the larger community wins by having a development that maintains the rural character and function of the area.

Like the one in this photograph, Limited Rural Developments look and function largely like the landscape did before the development.

There are numerous limited developments around the state, both in agricultural settings as well as in forest or lakeshore contexts. The example below illustrates how one property on the north shore of Lake Superior used limited development to protect sensitive lakeshore and scenic views from Highway 61. The property still retains substantial value while important site features are preserved for public benefit.

Instead of the 10 lakeshore lots permitted by zoning, this limited lakeshore development with two lots was profitable for the landowner and preserved sensitive lakeshore habitat and scenic views.

**How Do Conservation Developments Work in a Suburban Context?**

Perhaps the most common types of conservation developments are Open Space Subdivisions, which are often set in a suburban context. This type of development accounts for the majority of case studies in the Portfolio. It has received much attention in rapidly growing areas. Again, the resources that are most important to the community are first identified: in this case, the views of the farmland and farmstead (rural character); buffers to the lake or wetland; and woodland preservation. At the same time the developer wishes to market lots that have access to a trail system through the open space, a common dock and swimming area, and small neighborhood greens that create attractive amenities for the residents.

In the Open Space Subdivision example below, the farmstead is renovated and sold as a separate larger parcel and the farm fields can either be continued as a small scale agricultural area or restored into native vegetation. Meanwhile, less stormwater runoff is generated than conventional development due to a reduced amount of impervious coverage (roads, rooftops, driveways). Because there is more flexibility in lot layout, there is also more flexibility in how wastewater is treated. This example assumes that a waste treatment approach such as a constructed wetland system would be used. All of these benefits are achieved while providing three more lots than the original five-acre lot design. This provides additional financial incentives to the landowner and developer.

**Limited Rural Development: Three new house lots. The remainder stays as an active farm and preserved woodland.**

**Open Space Subdivision: 18 one-acre lots and 70% open space.**
Open Space Subdivisions are becoming more popular throughout the state. The metro area has seen more than a dozen different developments to date. The city of Lake Elmo created one of the state’s first open space ordinances, and as a result, it has the highest concentration of projects. At least nine different projects set aside 50% of the site or more in permanent open space. Lino Lakes, North Oaks, Washington County (May Township, Denmark Township, Stillwater Township), Elk River, Medina and city of St. Michael are among some of the metro-area communities have seen projects built or proposed that preserve open space. However, open space subdivisions are not limited to the metro area. The city of La Crescent in the southeast, Cook County in the extreme northeast, and Cass County in the northwest are among the out-state areas that have projects or ordinances that set aside open space to preserve bluffs, lakeshore or other community assets.

IS CONSERVATION DESIGN COMPATIBLE WITH MORE URBAN SETTINGS?

Finally, even in higher-density commercial or mixed-use communities there is an opportunity to preserve some of the parcels’ significant features. The metro area has seen several recent developments that have been acclaimed for their higher densities and neo-traditional designs, such as Liberty on the Lake in Stillwater. However, several such projects did little to preserve the signature natural features that were on the site prior to development. Even when pushing for more compact development, we should consider the development’s impact on natural and cultural resources.

The plan below illustrates that even at higher densities, the woodlands can still preserved, lake buffers maintained and several parks created in the process. This sketch includes approximately 200,000 square feet of commercial space and more than 100 housing units. In order to accommodate these higher densities, the open space function changes. For example, in this illustration the open space becomes a public park rather than preserved agricultural lands. However, the highest conservation priorities – woodland preservation and lake buffers – have not been compromised. In the end, these new developments are meant to recreate much of what we love about our older communities – such as town centers and their walkability – while still preserving cherished community assets.

The city of Red Wing and other communities are using this type of approach to create new village centers that reflect the historic character of the existing community (see High Park Village Case Study). They generally include mixed uses, higher densities and pedestrian-friendly streets. In the case of Red Wing, they also include affordable housing and the preservation of wooded bluffs. Ironically, while people appreciate the small town charm of communities such as Red Wing, Northfield, Stillwater or Marine on St. Croix, most ordinances do not allow them to be built today. The street widths, set-backs, density requirements and other codes make designing such a community impossible.

Lake Elmo has a high concentration of conservation developments, such as the Homestead pictured here.

Conservation Village: 100 housing units and commercial space. Primary conservation features are protected in parkland.

Neo-traditional developments focus on recreating a sense of place using town centers and walkable neighborhoods.
WHAT RESOURCES SHOULD A COMMUNITY STRIVE TO PROTECT?

Conservation at the local level should be driven by sound community goals. And good goal setting requires good resource information. For example, where are the most significant natural areas? What about watersheds of greatest concern? The conservation design process relies heavily on reliable natural resource data, such as geographic information system mapping from the County Biological Survey. Inventories can be conducted at various scales. While the County Biological Survey data are an excellent source, local inventories should be conducted as well.

Other qualities of a community can and should be mapped similarly to its ecological features. If scenic views are identified as a community asset, for example, these features should be mapped to help a community understand how scenic resources contribute to the quality of life of its residents.

HOW SHOULD CONSERVATION DESIGN BE INCORPORATED INTO A COMMUNITY’S LAND-USE PLANS?

Just as we need “smart growth” to coordinate our larger regional planning efforts, so too do we need “smart conservation” in which we are connecting systems of conserved lands as part of the community’s green infrastructure. If a community is serious about using conservation design as a tool to help create better developments, then it should ideally be formalized in both its comprehensive plan and subsequent zoning ordinances. The comprehensive plan should serve as the fundamental guiding document for the community. The better the goals for resource protection are identified in the comprehensive plan, the easier it is to develop an appropriate ordinance. Plans and ordinances should include strategies for connecting larger habitats together into a system of preserved areas.

The notion of connecting preserved areas together is not new. The famed park systems in Minneapolis and St. Paul, designed more than a century ago, were conceived as ways to protect the shores of the Mississippi River and the cities’ many lakes. While these parkways are not individual conservation developments per se, they established the framework for preservation while also providing the blueprints for development. The parkways were highly designed systems that strongly emphasized the interplay between the houses, streets, walkways and open space.

Parkway systems such as Minneapolis’ provide a model for new open space networks

Mapping of a community’s valued natural features can help inform good conservation design

Like natural features, scenic lands should be mapped to help guide the development process
Related efforts to design open space systems are underway today. The city of St. Michael, Northfield and many others have conducted open space plans that establish the framework for conservation in their communities. These open space plans are visionary documents that attempt to build on the tradition of parkways and expand it to include today’s understanding of ecological systems. They can help form the blueprint for what a community hopes to create using conservation design and other planning strategies.

**HOW DOES CONSERVATION DESIGN BECOME FORMALIZED IN AN ORDINANCE?**

At least 14 cities, counties or townships now have specific districts or ordinances relating to conservation design. These include: Lake Elmo, Washington County, Cook County, Cass County, La Crescent, Medina, Marine on St. Croix, Sherburne County, the city of Elk River and others. Of these no two ordinances are alike. Most communities do not mandate conservation development but instead provide it as an alternative to the underlying zoning. These communities then try to encourage its use by offering incentives if a conservation approach is used. Some communities, such as Lino Lakes and St. Cloud, have focused less on specific rules for the development and more on the process: environmental information is required when a plat is submitted and natural resource experts are expected to be part of the approval process.

Perhaps the most difficult aspect of any ordinance is to find the right balance between permitting flexibility and prescribing how the project should be designed. Many would argue that design flexibility is the antithesis to what is permitted or encouraged in most ordinances. Legislating good design is difficult. Even when an open space ordinance is in place, such as in Lake Elmo, the resulting developments can be quite varied in how successful they are. If the community is serious about using conservation design to protect open space, however, it will need to take on the challenge of creating workable ordinances that encourage conservation and creativity.

In addition to strict ordinance language, separate design guidelines can be used to help inform designers and developers what the community is looking for. These design standards can include desired open space configurations and illustrations demonstrating what types of preservation areas the community thinks are acceptable or unacceptable. These design standards can also cover architectural guidelines, lighting requirements, circulation, and infrastructure issues, such as stormwater management.

At a minimum, a community’s ordinances and approval processes should not discourage more appropriate developments, which is often the case. Fixed large-lot sizes, long set-backs, wide minimum lot widths and other design criteria within ordinances leave little room for creativity. All aspects of an ordinance need to be reviewed to make sure that a standard in one section of the ordinance is compatible with another.
HOW CAN A COMMUNITY ENCOURAGE CONSERVATION?

Many communities use both formal and informal incentives to encourage conservation. The most obvious is the use of density bonuses. Density bonuses in ordinances around the state range from 0% in Marine on St. Croix (there was no bonus density permitted for Jackson Meadow) to 100% in Washington County (you can get twice as many homes using open space development than you would be permitted under the 10-acre base density). More common approaches to density bonuses permit a 15% to 30% increase in the number of houses over the base density if a conservation approach is used. These bonuses are ideally tied not just to the use of a conservation development option, but to how the project meets specific performance requirements. In Lake Elmo, for example, the developments receive bonus lots if they put in trail systems, place on easement on the open space or preserve historic structures, among others.

There are other incentives to encourage conservation in addition to density bonuses. A community can speed up the review and approval of a conservation development if it meets certain criteria, which can save developers time and money. In some cases there is also cost-share money that may be available to help pay for specific conservation measures, such as the restoration of a riparian area or other stormwater management innovations. At the very least, the approval process for conservation developments should not be made more onerous than conventional development if the community hopes it will be used as an option.

HOW DO CONSERVATION DEVELOPMENTS RESPOND TO OTHER COMMUNITY GOALS SUCH AS AFFORDABLE HOUSING?

Growing communities have many goals in addition to conservation. One of the more difficult issues facing any new community is that of affordable housing. Conservation development and affordability are not incompatible goals, but they have largely gone untested in combination. Even with all of their other successful features, most of the conservation developments in the state have home prices that soar far beyond the reach of the average homebuyer. However, with more flexibility in lot layout, conservation design has some untapped potential to help address the issue. Smaller houses, townhouses or garage apartments can be designed to blend in with the remainder of the project. High Park Village, a proposed project in Red Wing, attempts to bridge this divide by requiring that a certain percentage of the units be affordable.

Conservation design is a strategy that is effective at preserving certain aspects of the site as it is developed; however, as we’ll see below, it is not a panacea for all of the aches and pains of growing communities.

CAN CONSERVATION DESIGN ADDRESS THE CONCERNS OVER SPRAWL AND RAPID GROWTH?

Sprawling development has become a lightning rod of controversy throughout many parts of the state. While conservation design can help fulfill certain goals of a community or county, it is not without limitations. For example, larger-scale wild areas need to be set aside for optimal protection of

A rural township with small town at center

Township with conventional five-acre lot density
certain habitats, such as those required by some larger mammals or certain interior woodland songbirds. Similarly, large-scale productive agriculture or forest management is best done in settings with low residential development.

Conservation design’s effectiveness at preserving these larger landscapes is really a function of two things: the underlying density and the parcel sizes. For example, in some rural areas, 20- or 40-acre parcels are the minimum size permitted by zoning. In these situations, conservation design can effectively concentrate houses in more suitable areas and maintain the functions of rural life using limited rural development. However, many communities have an underlying density of 2.5- or 5-acre lots in rural residential areas, yet they still hope to maintain a truly rural setting. In these cases, clustering the houses parcel by parcel, especially if the parcels are relatively small, will not preserve a working landscape.

Some habitats and dense development do not co-exist well, no matter how well the development is designed.

The graphics below illustrate this point. Using build-out scenarios can help a community visualize what their future will hold using different development scenarios. Build-out scenarios can help test a community’s planning and ordinance; unfortunately, they are too rarely used. These illustrations demonstrate that if a community sticks to its one house per 5-acre minimum density, most of its natural resources and rural landscape will be lost. If it chooses a conservation design approach, many rural qualities can be retained and a wonderful open space network can be created. However, if the community desires true large-scale agricultural preservation, then conservation design may not be the best choice, at least with an underlying 5-acre base density.

Conservation design is an important part of larger efforts in land conservation and urban/regional planning. Its effectiveness as a growth management tool by itself is limited. Parcel-by-parcel conservation development spreads housing throughout a landscape. To more effectively protect working landscapes in rural Minnesota, other conservation measures should be integrated, such as land acquisition, conservation easements, growth boundaries and Purchase of Development Rights or Transfer of Development Rights (PDR/TDR) programs. These conservation tools, including conservation design, should be carefully matched to the overall goals of the community or region. None of them will be as effective in isolation as they will be as part of a greater coordinated conservation strategy.
What is the Process for Conservation Design?

There is not one simple formula for conservation design. Instead, there are common elements that can serve as a guide to approaching a site with a conservation perspective. One example is the four-step process below, made popular by Randall Arendt, a leading practitioner of conservation design.

1. Identify primary and secondary conservation areas
2. Design open space to protect them
3. Arrange houses
4. Lay out streets, lots and infrastructure

While these steps oversimplify the complexities of conservation design, they are a good starting place to discuss the process.

How Do You Identify Conservation Areas?

Understanding the site’s conservation values is fundamental to conservation design. Identifying these conservation values requires two primary functions. You first need to have a general understanding of the conservation intent or goals for the project that are ideally spelled out in the community’s plans and ordinances. What is it that is motivating a conservation approach to the project? Preserving views? Setting aside natural areas? Buffering riparian areas? How large of a conservation area is required or desired (for example many ordinances set a goal of 50% open space).

Once some general priorities are decided, the next step is to map these features through a site-specific inventory, which should be an extension of the community mapping described in the Planning Consideration section. Such inventories should include: woodlands and other native communities; topography, scenic views, water bodies and drainage ways; or prime soils. They may also include cultural features, such as barns, farmsteads or archaeological sites.

How Should the Conservation Area Be Designed and What Should It Include?

Using these inventories, a judgment then must be made about what features are most valuable to include in a conservation area. There are two primary considerations for laying out the open space or conservation areas in any development design. First, there should be some demonstrable public benefit in the open space, which means that the preservation areas should be a first consideration in the design process. All too often in conservation developments, the open space becomes an afterthought. Sometimes the development is laid out in such a way that there is considerable “waste” space around the edges which gets designated as common open space. In these cases, the design process was not really altered from a conventional approach; the rear yard of each lot was just slightly reduced to provide a strip of left-over open space with little conservation value.

The conservation areas should cover both those sensitive features already regulated, such as wetlands and steep slopes, and other lands considered valuable to the community. These other lands may include scenic views, lakeshore or forested areas that could be developed under conventional zoning. The open space areas should

Often, the open space area is configured in left over fragments with little conservation value
contribute to the greater community as well as to the residents in the development itself. This means the conservation areas should be physically or visually accessible to the public. At a minimum, they should contribute to local air and water quality and certain natural and cultural features of importance.

Second, the open space should be able to be managed and defended from encroachment. The management of rear-yard strip areas or other fragmented open spaces is often more difficult than larger contiguous areas. In some projects, you cannot tell where the open space starts and stops, nor can the adjacent landowners. If the open space areas become treated like private yards, much of the conservation effort is lost. Even though the open space fragments may total more than 50% or 60% of the total parcel, the development wasn’t platted with the conservation values taken into primary consideration. Large, contiguous areas of open space make management easier. Using roads, fences or property markers to identify the boundaries of the open space helps make the open space more identifiable and understandable. This is important so that adjacent landowners are not tempted to treat the conservation areas as their private yards.

WHAT CONSIDERATIONS ARE THERE FOR THE HOUSES IN A CONSERVATION DEVELOPMENT?

Once the conservation areas are identified and open space roughly established, the remaining land is considered the ideal building zone. How the homes are designed or arranged in this area depends on many factors, including the desired development aesthetics. As the Case Studies suggest, there is a variety of housing styles and arrangements that can be incorporated into a conservation design. Some, like Jackson Meadow, attempt to make a conscious architectural statement; in others the housing styles are not really distinguishable from any other subdivision. With more flexibility in design, however, the homes can be arranged in more interesting patterns to take advantage of the site’s unique features and to attempt to build a more interesting sense of place. Many of the more successful projects use design standards that encourage energy-efficient houses and architectural styles that respect the historic character of the community.

Conservation design can provide many amenities that new homebuyers seek, such as trails, access to open space and natural areas and other safe recreation opportunities for children. In addition, with more creativity and flexibility, homes can be oriented so that interaction is encouraged. The architectural styles can give the development a unique identity by using front porches and shorter set backs to create an attractive streetscape. Garages can be designed so as to not dominate the front of the homes. And in some developments, such as the Fields of St. Croix, preserved buildings can function as focal points for the community.

*Homes can be designed so as to reduce the dominance of the garage and encourage more interaction between neighbors*
How Should the Circulation System Be Designed?

The development’s roads and trails should help reinforce the overall conservation objectives of the project. Roads that terminate into views of the open space or run along its edges contribute to the sense of openness and help define the common areas. Some open space developments completely surround the open space with lots and houses, which unfortunately blocks any views by the public into open space. The open space should be visually accessible by the public at key points to have public benefit and not simply be designed for the enjoyment of a few select homeowners.

Many conservation developments have successfully reduced the widths and lengths of the roads. This helps reduce impervious coverage, slow down traffic and create more attractive streetscapes. Many communities have conventional standards requiring all new roads to be at least 30 feet in width regardless of their function. This width is excessive for many residential developments and generates unnecessary amounts of stormwater. Streets should ideally be designed according the their function: for cul-de-sacs or low volume streets, an 18-foot carway width is often adequate for one-way traffic, whereas 24 feet is usually adequate for two-way streets with parking.

How can Conservation Design Infrastructure Help Protect Our Water Resources?

Conservation design minimizes development’s impact on water resources in several ways. It can first help prevent the generation of stormwater. Concentrating the roads and buildings reduces the amount of land disturbed and the area of impervious coverage. In addition, it maximizes areas of vegetation and more absorptive soils which helps maintain the hydrology of the site. Smaller lawns require fewer chemical inputs to maintain, which reduces the level of non-point source pollution. Conservation design can help keep shoreline areas undisturbed by keeping homes and infrastructure set back from the water’s edge. Controlling the management of the shoreline owned individually by dozens of homeowners is a daunting task. However, when it is common open space and part of the development concept, best management practices become much easier.

Conservation design can also more easily accommodate a wide range of stormwater mitigation practices and wastewater treatment systems that promote maintaining the pre-existing hydrology of the site and using natural processes. Infiltration, filtration, recreated wetlands and micro-storage are many of the practices and approaches that are being encouraged by initiatives such as Dakota County’s Low Impact Development Initiative. The primary goal of these efforts is to manage stormwater on the site, rather than sending it downstream to be someone else’s problem. Conservation design is an integral component to these efforts to protect Minnesota’s water resources.
HOW CAN DESIGN HELP MAINTAIN AN AREA’S RURAL HERITAGE?

Conservation design can help address many of the impacts of new development on scenic views and rural character. In fact, this goal is what motivated many people to begin exploring clustering and open space design more than 20 years ago. Topography and vegetation can help screen new construction from public views. Open spaces can be planned adjacent to highly visible areas, such as roadways, lakeshores, or trails. In addition, constructed rural features like farmsteads, barns, outbuildings and fences can help preserve an area’s sense of history. These strategies can be used whether the rural character is one of rolling farmsteads or "up-north" lakeshore communities.

As described above, there are cases in which a parcel can accommodate limited development and still maintain some of its rural functions. Projects such as Jackson Meadow demonstrate that it is possible to set aside entire intact agricultural parcels that are maintained as active farms. More than 200 acres of prime farmland were preserved adjacent to the development parcel. Projects such as The Fields of St. Croix preserve a different kind of farmland that is well suited for more intensive organic farming. And finally, Windsor Park and others set land aside for community gardening. Few people would advocate that conservation design is the best agriculture preservation strategy; however, in many areas it can preserve the potential of productive soils and open space that would otherwise have been lost to development.

HOW ARE WATER AND SEWER SERVICES HANDLED IN CONSERVATION DEVELOPMENTS?

Although the visual character of a conservation design often gets the most attention, it is the unseen infrastructure that often determines their environmental performance. There is no one means of servicing conservation developments. Some projects, such as Wild Meadows in Medina, are completely connected to community water and sewer. Others like Mineral Springs in Olmsted County use independent wells and septic systems on each lot. In order to more tightly cluster, many other projects use a common waste treatment facility for the development. For example, The Fields of St. Croix and Jackson Meadow use a highly-effective constructed wastewater wetland system to treat all of the houses in a central location.

Regardless of the system, conservation design has an environmental performance advantage over conventional design when it comes to locating wastewater treatment. Instead of being required to fit each treatment system on a lot regardless of soil quality or proximity to water, the best soils can be identified and used for treating the waste of the entire project on far less land. This also provides more flexibility for the rest of the design. This flexibility is especially important in Minnesota’s lakeshore settings.
WHO OWNS THE OPEN SPACE?

Land ownership is another important factor in conservation design. In many projects, a homeowners association (HOA) comprised of all of the landowners in a particular development retains joint ownership of the conserved open space. The homeowners are thus responsible for maintaining the open space, paying taxes and covering liability issues. HOA ownership of open space has become the most frequent model for conservation developments.

HOA ownership is not the only model, however. In Windsor Park, the city of Elk River owns part of the open space as a public park. In Jackson Meadow, the adjacent landowners own part of the open space and intend to keep it in agricultural use. And in Cardinal Ridge, a Lake Elmo project, the open space is partially owned by one of the landowners in the development who owns a larger lot extending over part of the open space. Regardless of ownership, the conservation purposes for which the land was set aside should still remain intact.

HOW SHOULD THE OPEN SPACE BE MANAGED?

The creation of a strong management plan – which identifies how the open space will be managed and by whom – is an important component of successful conservation projects. Just setting land aside does not ensure its long-term quality or viability. For example, when a homeowners association or other entity takes ownership of the open space, how will they know what areas were intended to be kept as forestland or prairie? How will the shoreline buffers be managed (e.g., what will keep them from being mowed down?)? The management plan would help answer these questions on how the protected area should be maintained to retain its conservation values. This plan would spell out specific goals and directions for various areas of the site.

These goals might include extensive ecological restoration to help bring the site back to an earlier time. The Fields of St. Croix in Lake Elmo, Jackson Meadow in Marine on St. Croix, and Mineral Springs in Goodhue County are just a few of the developments that have restored prairies and other native systems within the open space. Wild Meadows in Medina takes the restoration concept even further by restoring both the open space and much of the residential lots into woodlands and a mixture of prairie types and wetland species. This restoration also provides the stormwater management infrastructure for the development, thereby serving multiple purposes. Wild Meadows’ covenants require a part-time ecologist to help manage the property and educate residents about the ecological values that surround them.

Other developments around the country have even furthered this concept by prescribing what landowners can or cannot do on their individual properties. For example, some developments have designated no-mow areas on individual lots or enacted policies such as a no-pet restriction for residents (cows and dogs can have devastating impacts on certain bird species). These cases consider the multitude of impacts of residents adjacent to conservation areas, thereby extending the
environmental mission of the project beyond the open space borders to the individual landowners themselves.

HOW DO YOU ENSURE THE OPEN SPACE WILL STAY OPEN?

After going through all of the trouble to carefully design the conservation areas, it is important to have some assurances that the open space will not be developed in the future. Sometimes, a deed restriction is placed on the open space. Once the residents have come to appreciate the open space, they will likely fight for its preservation in the face of any further development pressure. In many developments, the open space is also further protected in the homeowners association covenants, which does not permit the HOA from developing the property.

For those properties with substantial natural or cultural features, however, it may be best to set the open space into a permanent conservation easement. A conservation easement is a legal agreement between the landowner and a qualified organization that protects in perpetuity certain conservation values of the property. To protect these values, the easement restricts certain activities. A conservation easement on part of a prairie open space, for example, might designate that the prairie land could never be tilled or developed. The homeowners association or some other party retains title to the land, while a land trust or local unit of government holds the right to enforce the easement’s restrictions. Most conservation developments in Minnesota employ easements as critically important elements in the larger conservation design process.

It should be noted that conservation easements are complex legal arrangements. They should be carefully considered when determining how to best protect the open space in a development. At times, they may be unnecessary due to the configuration of the open space or the goals of the project. In addition, they require continued diligence on the part of the holder of the easement to monitor and enforce it.
HOW SUCCESSFUL HAVE CONSERVATION DEVELOPMENTS BEEN IN THE MARKETPLACE?

For any form of development to thrive, it must be profitable. Fortunately, conservation developments have done very well in the marketplace, both in Minnesota and around the country. Sales rates in the majority of the projects have exceeded predictions and the prices for each home have also been higher than expected. In addition, in those areas employing bonus densities, developers often are financially rewarded for their conservation efforts. Research in several national surveys suggests that over the long term, conservation developments have been outperforming conventional developments in the same market in terms of the numbers and prices of sales. Also, market data suggests that homebuyers desire houses and developments that have access to natural areas and open space, incorporate mature trees and provide amenities, such as trails.

Lot prices themselves in many conservation developments suggest that people are willing to pay a premium to live in such a setting. Several of the lots in Wild Meadows in Medina, for example, approach $500,000, which doesn’t include the cost of building the home. This underscores the idea that a house on a smaller lot with a great view and access to open space can be worth as much or more than the same house on a larger lot that does not have access to these features.

ARE CONSERVATION DEVELOPMENTS MORE EXPENSIVE TO BUILD?

The costs associated with conservation developments vary from project to project. In general, there are some cost savings due to the reduced amount of roads and infrastructure required to service the project. Some projects such as The Fields of St. Croix or Wild Meadows, however, invest substantial resources up front to restore areas of the property or to renovate certain structures, such as barns. Fortunately, the costs associated with making a more interesting and functional development are often recouped through higher home prices and other incentives like bonus densities.

Developers have commented that innovation in land development is not usually rewarded as it is in other businesses. In many places, securing financial backing for a unique project is one of the greatest hurdles. For example, the developers of Jackson Meadow visited dozens of financial institutions before finding one that fully appreciated the goals of the project. Fortunately, as more conservation developments are built, the more they demonstrate their profitability.
WHO SHOULD BE INVOLVED IN ENCOURAGING MORE CREATIVE DEVELOPMENT?

Good conservation design does not "happen." Changing development practices requires confronting long-held planning and engineering beliefs of many people and institutions. Conservation design requires cooperation from all parties involved in the development process. This not only helps set acceptable goals for the project and design parameters, it also helps eliminate the barriers to changing developments that are often not technical, but personal in nature. Most successful projects have been championed by someone willing to promote alternatives in the face of opposition. Thus, even with all of our sophisticated planning and engineering techniques, it is often one person - an "agent of change" - who makes conservation design possible in a given community.

Many of the more successful projects have assembled design teams that include landscape architects, engineers, architects and natural resource professionals. Leaving the design entirely up to any one party, such as a surveyor, will likely result in a less comprehensive and effective project.

Finally, getting the project approved requires the cooperation of local government planners, engineers, and officials. Getting all parties to understand the overall conservation intent and vision for the development is important to do early in the process through sketch plans and site visits.

WHAT OTHER RESOURCES ARE THERE THAT PROMOTE CONSERVATION DESIGN?

The short list of publications and contacts below contains just a few of the resources available to help further define conservation design and its various components. This list is by no means comprehensive, but these resources can serve as a starting point in efforts to combine conservation and development.

Center for Watershed Protection, 1996

Conservation Design for Subdivisions
Randall Arendt, Island Press, 1996

Conserving Wooded Areas in Developing Communities
Minnesota Department of Natural Resources, 1999

From Policy to Reality: Model Ordinances for Sustainable Development
Minnesota Planning, April 2000
www.mnplan.state.mn.us/sd/ordinances.htm

Natural Areas: Protecting a Vital Community Asset
Laurie Allmann, Minnesota Department of Natural Resources, 1997

Rural by Design
Randall Arendt, APA Planners Press, 1994

Low Impact Development Publications
www.epa.gov/owow/hps/urban.html

Open Space Design Development: A Guide for Local Governments
Washington County, Metropolitan Council, BRW, Inc., 1977
Produced by

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The University of Minnesota's
Design Institute, an initiative intended
to explore the use of design in solving
particular public concerns and
problems.