HAYS COUNTY CONSERVATION DEVELOPMENT GUIDELINES: A SUSTAINABLE FUTURE

2022

Commissioned by:

Hays County Commissioners Court

Developed by:

Gap Strategies

GUIDING HAYS COUNTY DEVELOPMENT

In February of 2020, the Hays County Commissioners Court approved the updating of the County's Conservation Development standards and regulations, Chapter 765 in the County's Development Standards. The Commissioners Court partnered with a large, multidisciplinary consulting team consisting of experts in urban planning, public engagement, landscape architecture, GIS and mapping, civil engineering, environmental regulation, conservation design, and finance and economic incentives. Together they worked to gather input, insight, and ideas from County staff, key stakeholders, and the broader community.

The result of this collaboration is the Hays County Conservation Development Guidelines, presented to the Commissioners Court in February 2022. These guidelines provide a framework for the County to follow to incentivize developers and landowners to develop the Hill Country and the Blackland Prairie in a more conservation-oriented, sustainable manner in order to preserve the historic culture of the County.

TABLE OF CONTENTS

CONSERVATION DEVELOPMENT
EXECUTIVE SUMMARY

As Hays County gains new people, doubling its population every 20 years, it risks losing the very things that have made it one of the most attractive destinations in the country: its natural beauty, its economic vitality, its historic character. Time and again across the state, and across the United States, rapid suburban growth has overwhelmed the natural resources and local infrastructure of communities in its path.

There is another way.

Select communities across the country have implemented innovative regulations to promote the preservation of natural resources and native landscapes through "conservation design." While still outside the norm in Texas, especially among Texas counties, conservation design regulations and incentives have proved an effective tool for growth management and design flexibility in many places across the United States and around the world. Conservation design presents a number of benefits – to local communities, local governments, and to builders.

In recognition of this, Hays County has for several years offered a conservation design option as an alternative to the traditional development path. Even so, conservation design has remained rare in the county. As of the end of 2021, no developer had used the discretionary option for conservation design in the County's rules to present a subdivision plan to Hays County regulators.

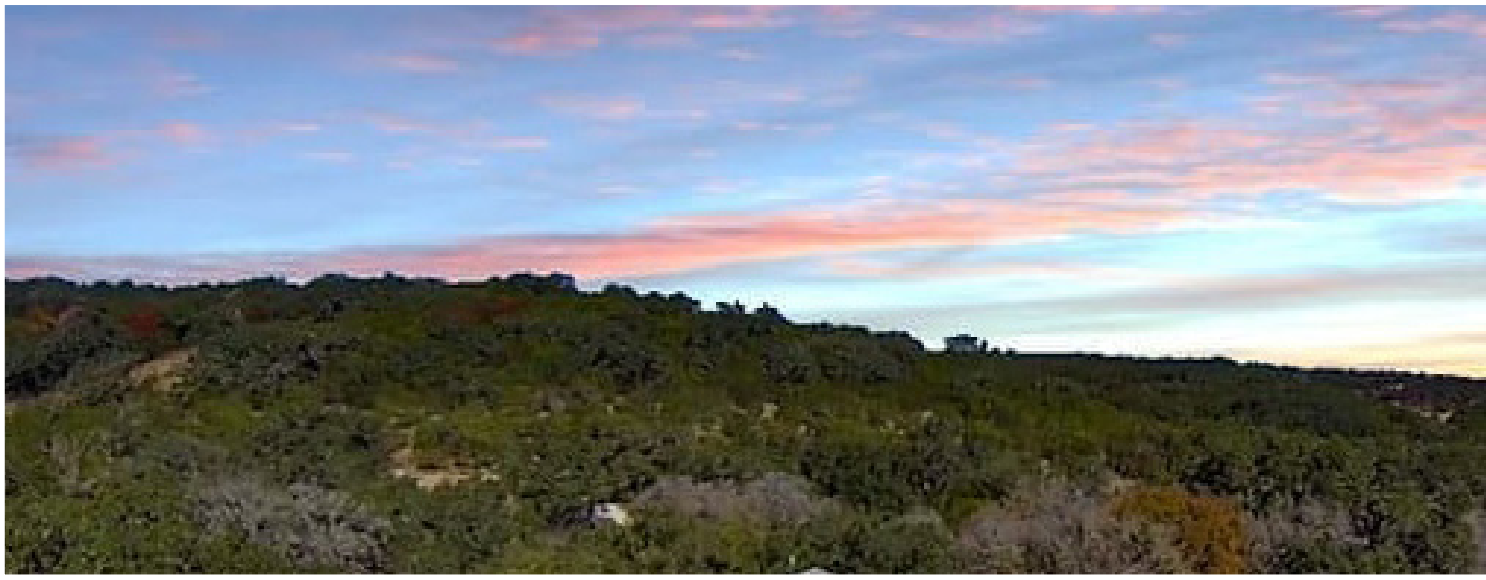
Why? Is it that conservation design won't work in Hays County's unincorporated areas – where the County exerts primary jurisdiction – or are there other factors at play: market expectations, financing challenges, regulatory hurdles?

WHAT IS CONSERVATION DESIGN?

An innovative approach – and alternative to traditional development design – in which a significant percentage of buildable land is set aside and permanently protected as natural open space. Residential and commercial lots, and road networks, are designed around the protected lands. This is primarily a design approach for conserving existing natural and cultural resources.

To find the answers, and to explore substantive alternatives, the Hays County Commissioners Court issued a competitive Request for Proposals in late 2019, searching for multi-disciplinary professional teams to help the County take a fresh look at ways to plan a better development future for the County, specifically focusing on the potential for a more robust and enticing conservation design program. In the spring of 2020, the County selected a team led by Gap Strategies to lead the project.

The County Commissioners Court, and county staff, have long been sensitive to the disruptions – financial, social, and environmental – caused by rapid population growth and urbanization. It has now been 50 years since significant suburban growth began to spill into the county from neighboring urban cores in Austin and San Antonio. At first, the County's initial response was limited, due in part to restrictions by the state legislature. But for nearly three decades now, Hays County has been among the forefront of Texas counties in addressing long-term growth through planning and innovative development rules.



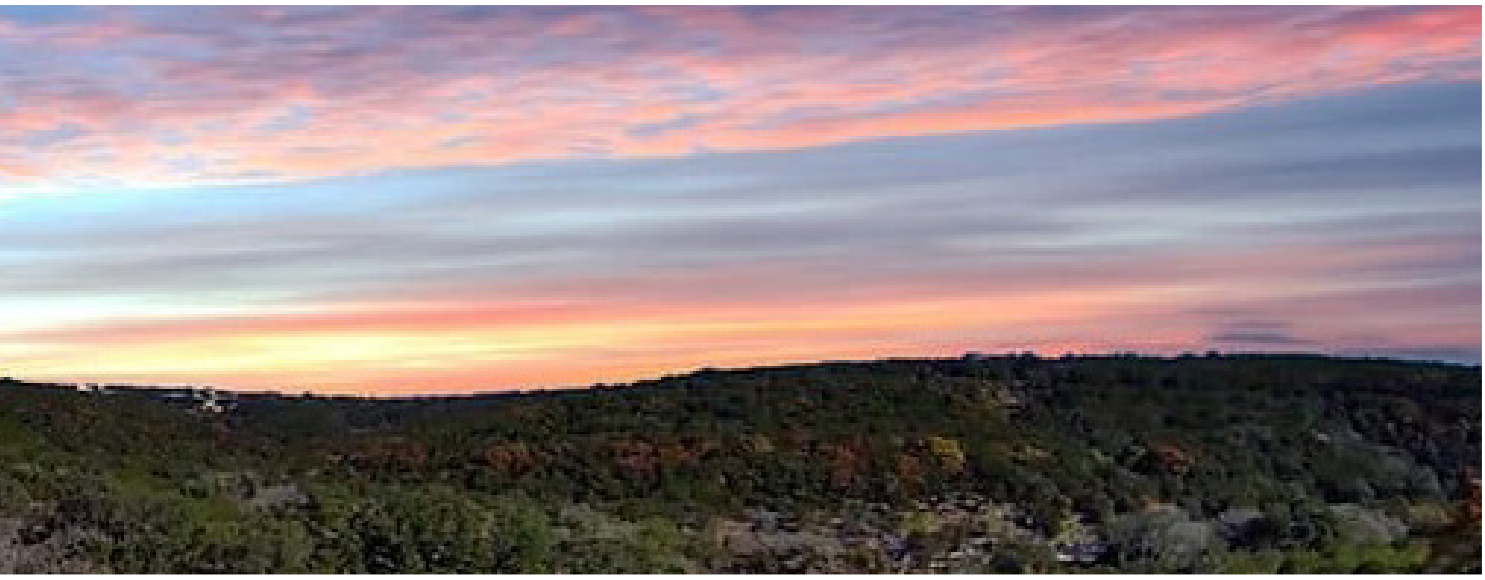
In the 1990s, the County joined in fighting the Elgin Bank decision, a district court case in Travis County that opened additional loopholes for substandard development across the state. In response, the County helped lead efforts to change outdated state legislation, and produced what the Texas Association of Counties referred to as a model set of development regulations, tightening standards and fostering innovations such as rainwater collection and cluster development. In the 2000s, the County was active in water quality protection and open space preservation, further strengthening its environmental and subdivision rules while maintaining a rapid pace of growth.

In recent years, Hays County leaders have led with context-sensitive design on major roadway projects in ecologically sensitive areas, fostered record parks and open space bond projects, and partnered with both cities and other regional entities to address the challenges brought by continued rapid development. Despite concern years ago that such effort might inhibit economic growth, the County has continued to grow at a pace matched by few other places.

The County has grown from a population of **65,614 in 1990** to an estimated population of **245,161 in 2021**.

The Hays County 2021 Transportation Plan projects a whopping population of **694,000 in 2045**.

In the last decade, census figures indicate **Hays County is the fastest growing county in the United States** in percentage increase, among counties with at least 100,000 population.



Assessed Value in the County has grown at an even faster pace, indicating the market was receptive to the County's focus on environmental stewardship and innovative development regulation. While population increased approximately 56 percent from 2010 to 2021, assessed property value in the county grew by about 267 percent, from $10.8 billion to a preliminary assessed value of $39.6 billion in 2021.

> If Hays County's population is to become 694,000 by 2045, as projected, that means **the County will add a group of people the size of San Marcos every five years.**

This rapid increase in population poses difficult challenges for crowded roads, for natural resources, and for quality of life among existing residents. Finding innovative ways to address these challenges, finding ways to turn them into opportunity, is the underlying purpose of this project.

Dubbed Conservation Development Guidelines: A Sustainable Future, the project has been overseen by the County's Natural Resources Coordinator, Alexandra Thompson, the Director of Development Services within the Environmental Health Department, (first Caitlyn Strickland, then Marcus Pacheco); and Mark Kennedy, the general counsel for the Commissioners Court. From the Court, a subcommittee of Precinct 3 Commissioner Lon Shell and Precinct 4 Commissioner Walt Smith provided direction and oversight. The professional team consisted of Gap Strategies, a community planning and public engagement firm that practices across the state and is located in Hays County; The Siglo Group, experts in geospatial data analysis, and natural resource planning; Doucet & Associates, a civil engineering firm with expertise in infrastructure, water, and land development; SWCA, an environmental and habitat planning firm with deep experience in Hays County; TBG, a landscape

architecture firm with a wide array of private development clients and key members steeped in urban design and conservation design; DPFG, a consulting firm dedicated to innovative finance solutions for governments, landowners, and private developers; and Randall Arendt, a Senior Conservation Advisor at the Natural Lands Trust, Fellow of the Royal Town Planning Institute in London, and the author of several seminal books on conservation design, including **Conservation Design for Subdivisions**, **Growing Greener: Putting Conservation Into Local Plans And Ordinances**, and **Rural By Design**. Jeff Barton, AICP, served as project manager.

Work on the project commenced in the early summer of 2020, amid the COVID-19 pandemic.

Over the next year, the planning team:

- Reviewed existing subdivision and development regulations in Hays County, including Chapter 765, the existing alternative conservation development rules.
- Analyzed and mapped growth trends, land use patterns, and environmentally sensitive areas within the County.
- Produced a report on the effectiveness of conservation design trends in other areas, both inside Texas and out, focusing on what worked and what didn't.
- Identified groups and organizations inside the County and within the region that might have special interest or expertise on development, land ownership, and conservation design – ranging from environmental organizations to city leaders, engineers, developers and builders – and surveyed them on attitudes, alternatives, and opportunities.
- Sponsored a seminar on conservation development for local stakeholders and the public.
- Prepared initial technical and administrative recommendations.
- Conducted a "real world" design charrette, or workshop, using planners, engineers, landscape architects, regulators, and financiers to apply conceptual recommendations to two actual tracts of developable land – one west of I-35 in the Hill Country, and one east of I-35 in the Blackland Prairie.
- Refined recommendations and technical analysis based on public comments and the design workshop.
- Developed a final set of recommendations, including proposed incentives to make conservation design more accessible in the County, and a set of criteria to qualify for incentives.

The results of this work are presented in detail in this report.
The analysis and recommendations are based on several key findings:

1. **NEW CONSERVATION RULES ARE NEEDED.**
   The current conservation development regulations, embodied in Chapter 765 of the County's development rules, are designed to allow and promote alternative development strategies such as conservation design. But these regulations are not working as intended because landowners and developers do not feel they have meaningful incentives to learn new techniques, overcome hurdles in traditional finance, and to risk going outside traditional market approaches to development in the County.

2. **YES, IT WILL WORK.**
   Conservation development design is feasible in Hays County.

3. **THE CONCEPT IS APPROPRIATE ACROSS THE COUNTY BUT TAILORED OPTIONS ARE NEEDED.**
   The concept can work both on the prairie east of Interstate 35 and in the Hill Country to the west, but because of different geologic, infrastructure, and market conditions across the County, and because of the different size and types of developments (including re-subdivisions of smaller tracts), Hays County should consider creating two tiers of regulation (and incentives). The first, addressed in detail in this report, might be considered true conservation development design; and the second, to be "Context-Sensitive" or "Greenway" development design, with fewer restrictions and fewer incentives.

4. **THE MARKET IS READY.**
   There is strong interest among stakeholder groups for meaningful options to address conservation design. New guidelines and an active education effort would likely result in immediate experimentation with the concept in the private market.

5. **A BROAD SECTION OF THE PUBLIC WOULD BENEFIT.**
   Conservation design incentives, and related refinements and innovations, would benefit a wide variety of Hays County residents and

future residents: taxpayers, homebuyers seeking more choice, home builders, landowners, conservationists and environmental activists. Such a project can benefit water quality, drinking water availability, flood control efforts, and endangered species, helping preserve the County's natural character while reducing infrastructure costs, impervious cover, heat island effects, and ongoing infrastructure maintenance.

6. **DEVELOPMENT AGREEMENTS ARE NECESSEARY TO EFFICIENTLY IMPLEMENT THESE PROPOSALS.**
   Across the country, a variety of tools and regulatory strategies are used to support conservation design. To minimize the cost to taxpayers, allow for site-specific flexibility, and in keeping with the County's lean approach to staffing, we recommend the use of development agreements to implement the County's new conservation design policies. Such agreements are authorized under Chapter 381 of the Texas Local Government Code; Hays County staff are already adept at negotiating and administering such "381" agreements.

In the following chapters, the planning team presents in further detail the key principles and specific proposals to make conservation design and related alternatives work in – and for – Hays County. This includes the principle that conservation design should be an option, not a mandate (a mandate would not only alienate some builders and buyers but might well run afoul of state law). In other words, while conservation design is a highly useful tool to foster more diversity and choice in the marketplace, providing substantial public benefit, it should not be

the only option. Appropriately, the County plans to continue permitting traditional developments, provided developers meet the County's standards and state law. By establishing new, innovative rules for conservation development as an opt-in alternative, accompanied by incentives, the County may catalyze more innovative development. Indeed, we believe it will. But the ultimate choice for how to develop will be left to landowners, builders, and homebuyers – in other words, to individuals and a free market.

This report groups public policy goals for conservation development into **nine focus areas**, each with its own criteria and specifications. There are also **three tiers of incentives**.

The **more policy goals that are met** – and the higher the standard at which they are met – the **more valuable the incentives that the County will consider**.

Finally, as noted above, the planning team for the project recommends that the County use tailored, property-specific development agreements to implement this concept, and to make conservation development an integral part of the regulatory framework of Hays County. This should allow the County to negotiate with potential conservation design developers within an established, public framework, while leaving room to weigh site-specific circumstances and considerations. In the 173rd year since the County's founding, conservation design and related policies can and should be vital tools to help Hays County prepare to meet the ongoing challenges of rapid growth while protecting the quality of life that is drawing so many people to choose Central Texas as their home.

CHAPTER 1

WHY CONSERVATION DEVELOPMENT DESIGN IS IMPORTANT TO CONSIDER FOR HAYS COUNTY

WHAT IS
CONSERVATION SUBDIVISION DESIGN?

Conservation development is a method of developing land for housing in a way that preserves open space for future generations. Typically, it involves building homes in groups with smaller lot sizes and protecting natural features like open space for use by all residents. Although relatively new, conservation development is a proven concept that has worked successfully in many parts of the country, and around the world.

Conservation development design is “twice green: green environmentally and green economically” (Randall Arendt). These types of developments help the surrounding natural area by creating larger, permanently protected lands, conserving pristine open spaces that otherwise could be developed.

Conservation subdivisions provide unique and diverse housing options for those not interested in living in typical, sprawling, heavily homogenous, and concrete-saturated subdivisions. These types of developments have proven to be very profitable and provide great opportunities for investors as homeowners have statistically shown that they are willing to pay more for housing in areas with permanently protected views and easy access to large open spaces, parks, and nature trails.

Conservation developments are a win-win across the board and have something for everyone to enjoy.

AMPLE, PROTECTED OPEN SPACE

Permanently protected open spaces provide critical habitat for wildlife, undisturbed scenic vistas, flood prevention, and the preservation of agricultural, historical, and cultural areas that help make communities what they are.

DIVERSE & DENSE HOUSING

High-density, highly diverse, energy efficient residential housing options, built with sustainable materials, containing minimal private yards and impervious surfaces, are typically found in conservation developments.

HEALTHY & THRIVING COMMUNITY

Conserving and restoring open spaces and implementing green infrastructure help with water quality and abundance efforts, provide cleaner air, as well as ample park space for active outdoor recreation which promote healthy lifestyles.

PRIVATE & PUBLIC PROFIT

Parks and open spaces facilitate a high quality of life that attracts tax-paying businesses and residents to communities. Open spaces and trails raise property values, boost tourism, stimulate commercial growth, and promote inner-city revitalization.

CONVENTIONAL SUBDIVISION DESIGN

Land is often chopped up into equal parts, in this case, 18 house lots. Roads and buildings are placed for convenience, and very little attention, if any, is paid to preserving the on-site and surrounding natural landscape and ecological integrity of the site. There is little or no shared open space. In this particular development shown above, only lakeshore lots have water access. Privacy is valued over creating a neighborhood with a sense of community.

Images provided by Randall Arendt's 1994 book "Rural by Design"

CONSERVATION SUBDIVISION DESIGN

The same number of lots can be achieved, in this case, 18 house lots. However, rather than prioritizing roads and private land over the natural landscape, the most ecologically-sensitive and culturally-rich areas are preserved. 40 to 80 percent of the land becomes permanent open space to be enjoyed by all property owners. Buildings and roads are placed in the least sensitive areas of the property. Walking trails, parks, and shared water access help to create a unique sense of community.

PUBLIC AND PRIVATE
BENEFITS

Conservation developments provide a plethora of benefits; not only to the natural environment and subdivision residents, but also to the developer and the broader community. Through this green design approach, large swaths of undeveloped land are conserved and protected in perpetuity from future encroachment and development, often adding to existing conservation lands to create a larger contiguous open space. In the long run, these types of conservation-oriented developments help maintain the character of rural areas, fostering a greater sense of community, while also ensuring the protection and preservation of water quality and quantity, celebrated cultural locations, wildlife habitat, and more.

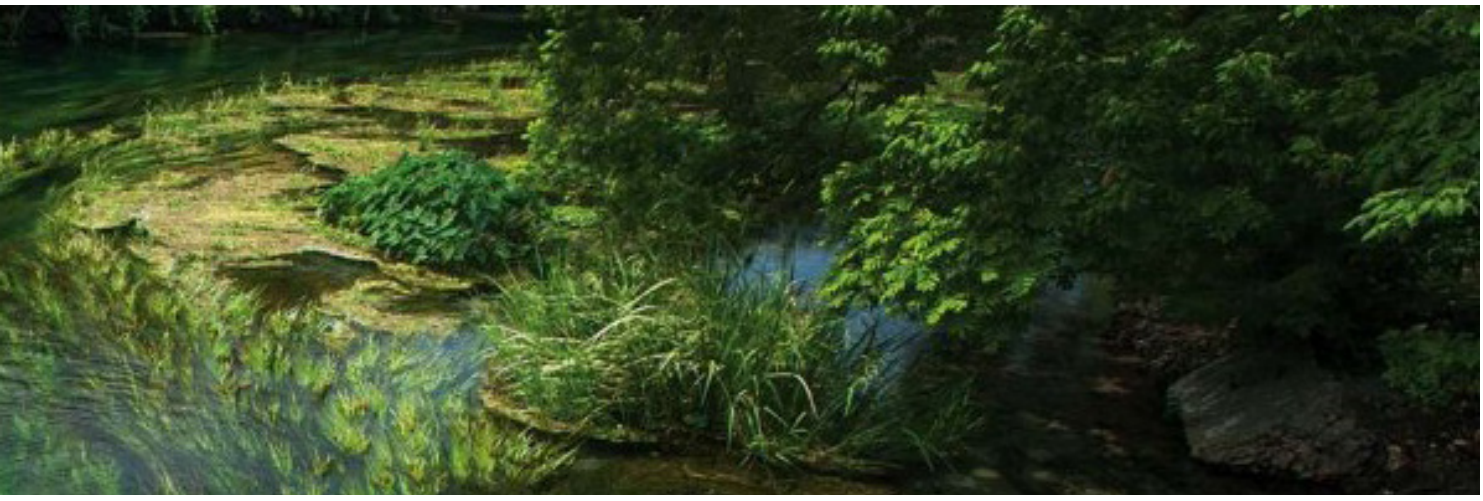
Further fragmentation of the land is limited with this design approach. The protection and long-term maintenance of scenic landscapes and open spaces for passive recreation provide easy, permanent access to green areas for the general public. Conservation subdivision residents don't need to worry about their neighboring open space being developed into more houses or a parking lot in the future. A community can gain a new park space where visitors can be closer to nature and make lasting connections. By protecting pristine open spaces from ever being developed – whether they be waterways or wetlands, agricultural areas, a forest or meadows – a community's air and water pollution can be reduced significantly. Because vegetated lands easily absorb rainwater and runoff, soil erosion can be prevented, negative impacts of flooding and peak storm events reduced, and greater amounts of storm and surface water can be filtered through natural means before reaching the underground aquifer. Often overlooked, conserved natural lands, trails, and working farms and forests often also generate financial returns, both to governments and individuals, and create significant

savings. Several conservation developments across the country have conserved working farms to continue providing the community with fresh produce.

Additionally, the permanent preservation of undeveloped land provides critical habitat for wildlife, providing increased protection for endangered species, and promoting biodiversity among animals and plants, which in turn improves their resilience to drought and invasive species. In the long run, the health of the land and natural environment are significantly improved, and wildlife are able to thrive relatively undisturbed by the surrounding urban environment.

Typically in conventional subdivisions a developer must choose between a return on investment or providing sustainable community benefits. In conservation subdivisions, however, everyone wins. Since property values tend to be higher in areas located adjacent to green belts and permanently protected view sheds, developers are ensured a high return on investment. And by condensing the size of the developable area on the property, and increasing overall density, developers and investors maximize their profit by achieving the same residential lot and unit yield that they otherwise would have achieved in a conventional subdivision. Because of this condensing and reduction of sprawl across the property, less infrastructure and impervious surfaces are needed – meaning less concrete and paving are required – giving developers major savings on infrastructure construction costs. Innovative green infrastructure design, such as Low Impact Design (LID) and other approaches, can also help keep infrastructure costs low. Not only are conservation developments beneficial to the natural world and provide a unique and more sustainable mode of living for residents, these types of developments tend to be cheaper to build and highly profitable. Conservation subdivisions preserve pristine undeveloped lands for future generations to enjoy, protect a community's food and water supply, purify the air, provide necessary habitat for wildlife, and strengthen the overall sense of community.

For more information on the specific benefits conservation design can provide, please refer to the Benefits for Species and Land Protection section 5C of this report.



GROWTH AND PRESSURE

DEMOGRAPHICS

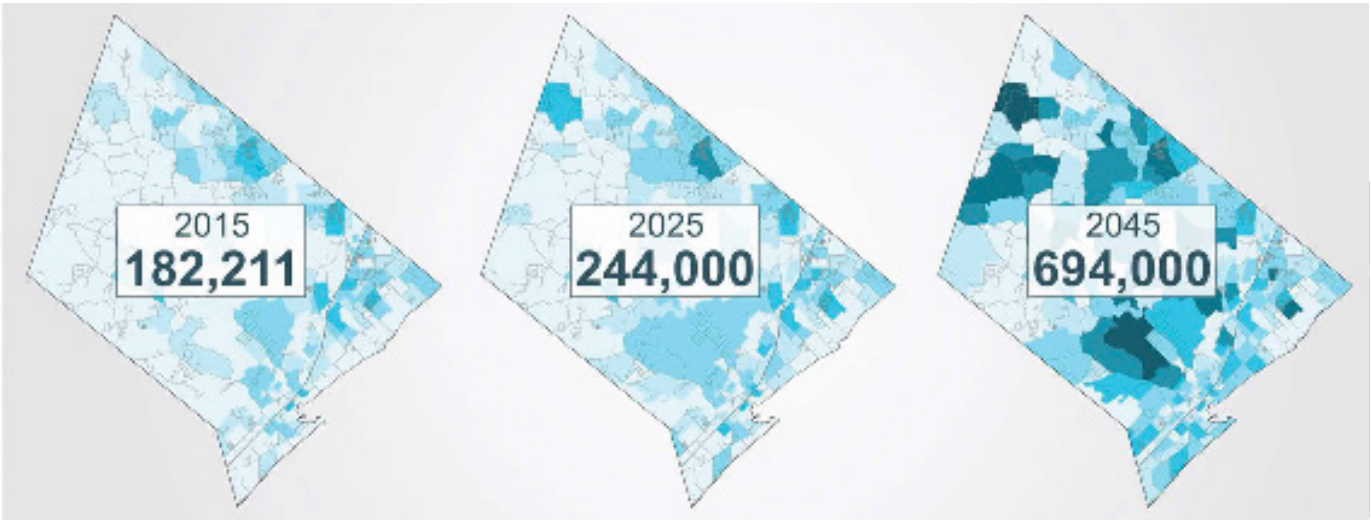
Exponential population growth in recent decades throughout Hays County, and the broader Central Texas region, is the main driver of this multifaceted conservation effort. Recent growth has been driving the search for alternatives to typical, sprawling subdivision development. CAMPO, the Capital Area Metropolitan Planning Organization that provides regional transportation planning for Travis, Hays, Bastrop, Burnet, Caldwell, and Williamson Counties, forecasts that the Capital Area region will continue to grow, more than doubling in population, reaching nearly 4.7 million residents by 2045. The counties in the metropolitan area's periphery are expected to see higher population percent changes, particularly Hays, Williamson, and Bastrop Counties as they evolve from rural and suburban communities to more developed and urban communities. Hays County's population in particular is forecasted to grow by nearly 281% from 182,211 residents in 2015, to a whopping 694,000 residents by 2045.

HAYS COUNTY'S POPULATION IS QUICKLY GROWING

+ 281%

FORECASTED BETWEEN 2015 AND

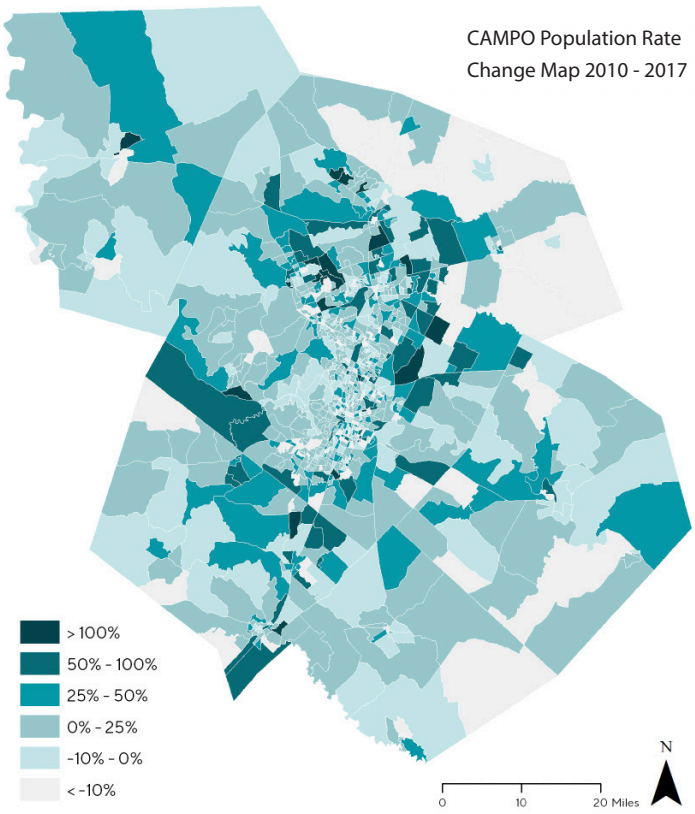
MORE THAN TRIPLING TO REACH AN ESTIMATED 694,000



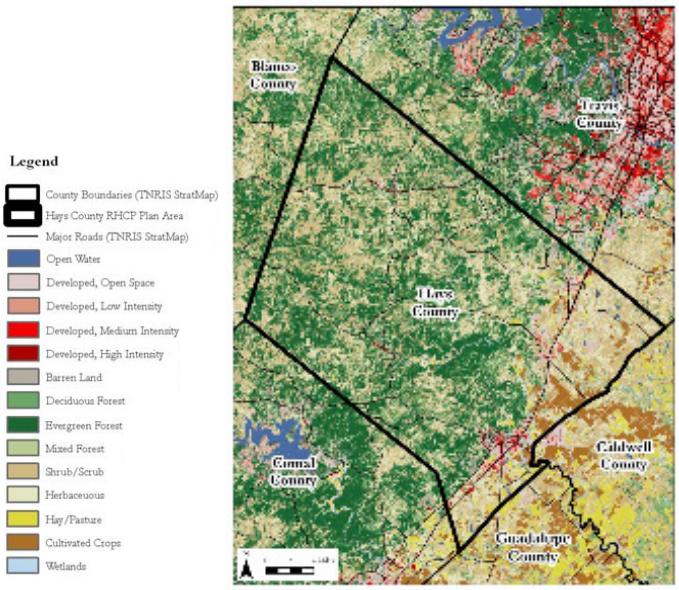
GROWTH WILL BRING ABOUT CHANGE

This exponential growth and increase in urbanization throughout the County and broader Capital Area will transform the region. More people and cars will strain the County's existing infrastructure, and more density will require additional vacant land to be developed. If not careful, much of Hays County's green, rolling hills throughout the Hill Country, meadow and prairie land east of I-35, and prime farmland soils, could be cleared for the next typical sprawling suburban development, or more gas stations and strip malls. If not regulated carefully, the County's quality and abundance of its finite resources could be depleted and exhausted. Pouring cement over these pristine, cherished lands would change the character of Hays County forever. There must be guidelines in place that incentivize developers and landowners to develop vacant properties – particularly large properties with highly ecologically-sensitive lands on-site – in a more sustainable and conservation-oriented manner.
This is what these guidelines are set to accomplish.

RECENT REGIONAL EXPONENTIAL GROWTH HAS BEEN QUICKLY TRANSFORMING THE RURAL HILL COUNTRY AND HAS BEEN FILLING IN REMAINING UNDEVELOPED PARCELS IN THE GREATER AUSTIN AREA.



On par with regional population growth forecasts, the employment growth pattern in recent decades points to significant increases in suburban and exurban areas. Much of this growth is expected to concentrate along the region's major transportation corridors, including I-35, US 290, FM 734 and SH 71. This unmatched growth in population, employment and available services is expected to generate a sizable increase in travel demand within the region. Not only does this mean more cars on roads, which is tied to a higher chance of water and air pollution, it means more ranch and prairie land will be torn out to build sprawling subdivisions, new and expanded roads, commercial and office centers, public facilities, and parking lots.



A majority of the County's existing conservation lands are located on the west side, home to the beautiful rolling hills of the Texas Hill Country, and the well-known Trinity and Edwards Aquifers. Close to 75% of Hays County lies over the Trinity and Edwards Aquifer Recharge Zones, approximately 320,174 combined acres of Aquifer land. As the majority of existing conservation lands are located over these Aquifers, careful and thoughtful consideration should be given to these sensitive and finite environmental resources within the County.

In contrast, population growth concentrations are higher in the east side of the County, home to the Blackland Prairie ecoregion and rich Prime Farmland Soils, though growth is accelerating in western Hays County as well. The east side of the County is dominated by farm and ranch land with naturally nutrient-rich soils perfect for agricultural enterprises and cattle grazing. Often overlooked, agricultural zones are just as important as other environmental resources and must be prioritized accordingly in land conservation and preservation efforts.

In the illustrative maps of the following section, Hays County Natural Resources, you will see that major growth areas across Hays County are concentrated in highly environmentally-sensitive zones. Currently, only 8% (34,373 acres), of the 434,270 acres that make up Hays County, serve as permanently protected and conserved open space. About 58% (252,724 acres) of Hays County land has the potential for conservation development. This 58% of County land only includes parcels that are greater than 20 acres in size and are not already under conservation protection. Of the 252,724 acres prime for conservation development, nearly 71,000 acres are considered ideal for conservation development as they are located adjacent to existing protected lands.

GROWTH AND PRESSURE

HAYS COUNTY NATURAL RESOURCES

Sitting at the transition of the Blackland Prairie and the Hill Country, Hays County has a wealth of ecological resources and a rich culture that draws in people from around the nation. Whether soaking in the spring water of the Blue Hole, enjoying a glass of wine at a local vineyard, or kayaking the San Marcos River, the lands and waters of Hays County are major regional attractions. The rapid population increases in recent years by this appeal, coupled with the significant development of pristine and ecologically-sensitive open spaces, threatens to undermine the characteristics that make Hays County so special. One way to protect the natural landscape of the County, while still embracing a growing population, is through conservation development.

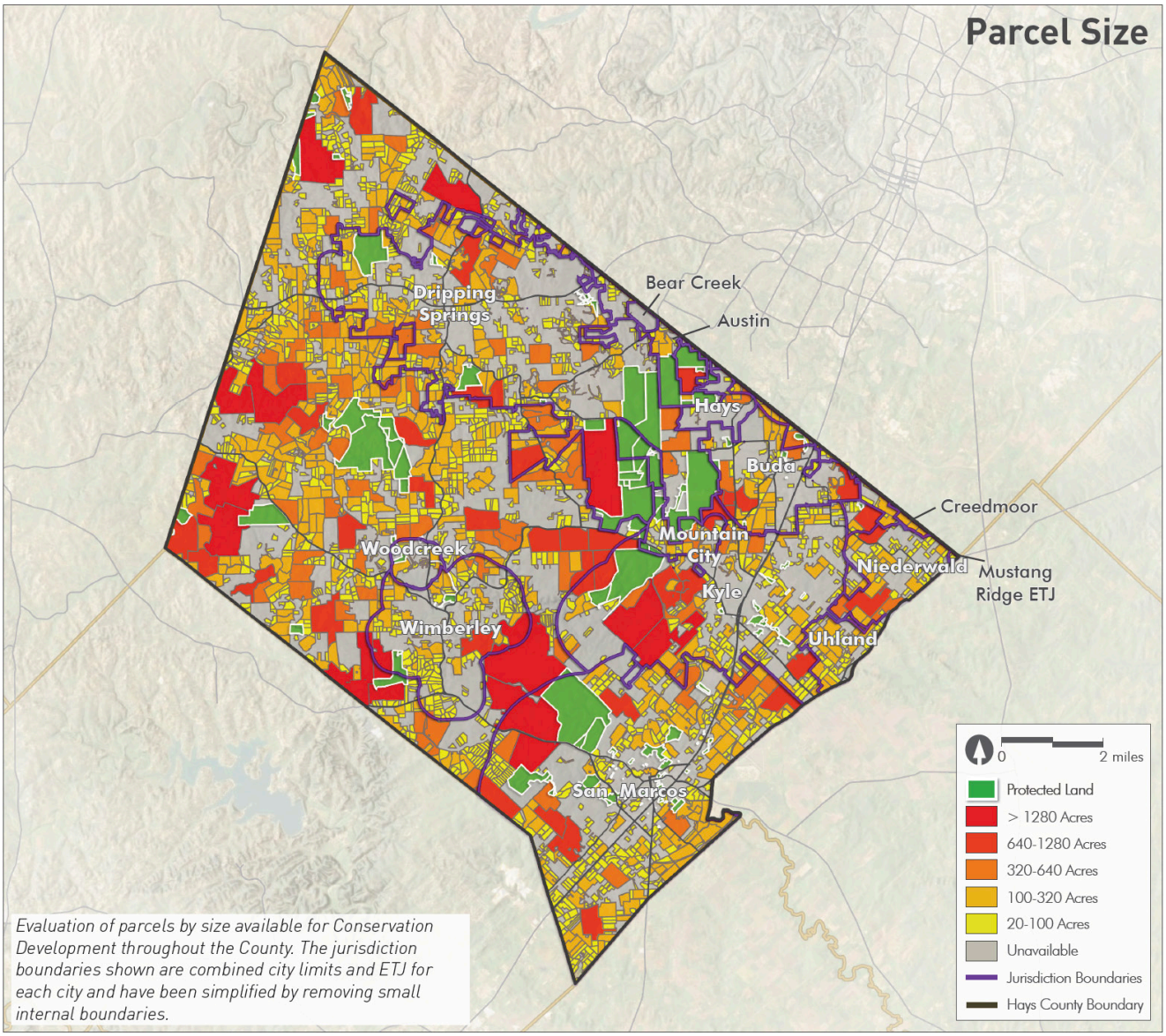
The purpose of this document is to guide planning of conservation development in Hays County, both by informing the creation of guidelines for conservation development and by highlighting locations of various finite resources that could be beneficial assets in conservation design. The resources are grouped into three categories: Water Resources, Cultural Resources, and Ecological Resources. The Water Resources section walks through the various aquifer recharge zones, karst areas, spring buffers, public water supply well buffers, floodplains, and water quality buffers within the County. The Cultural Resources section, on the other hand, demonstrates the locations of large, undeveloped land parcels currently adjacent to protected lands, existing trails, major growth areas, prime farmland

soils, potential archeological sites, and scenic vistas. While the Ecological Resources section includes locations of riparian and floodplain vegetation, steep slopes, the Terrestrial Fauna Ecological Index from the Texas Parks and Wildlife Department, and Golden-cheeked Warbler habitat.

These resources can both individually and collectively contribute to the ecological value of conservation developments. For example, by overlaying preserved lands on prime farmland soil, Golden-cheeked Warbler habitat, and aquifer recharge zones, conservation developments can help protect multiple valuable resources. Additionally, by mindfully planning within or around floodplains, growth areas, and trails, conservation subdivisions can provide long-term, attractive, and resilient housing opportunities to the local community.

The development pattern within Hays County is impacted by the location of municipalities and major roads. Parcels less than 20 acres dominate the landscapes around the Cities of Wimberley, Dripping Springs, Buda, Kyle, and San Marcos, along the I-35 corridor, and along US 290. In these areas, conservation development is an unlikely tool to shift land use patterns. On the outskirts of these municipalities – in the ETJs and in the unincorporated parts of the County – conservation design can be a significant tool in clustering development and creating larger tracts of conservation lands.

There are **2,354 parcels** in Hays County that are considered **available for conservation development** (area greater than 20 acres and not already under conservation), **with an average size of 109 acres**.



Evaluation of parcels by size available for Conservation Development throughout the County. The jurisdiction boundaries shown are combined city limits and ETJ for each city and have been simplified by removing small internal boundaries.

To better understand the patterns of parcel size, the land parcels were broken down into five categories: 20-100 acres, 100-320, 320-640, 640-1280, and >1280 acres (Table 1). Parcels 20 acres and below were not considered in this evaluation, as the likelihood of a developer conserving a large portion of those parcels is not feasible. In addition, the conservation value of smaller tracts (10 acres) is less than the conservation value of larger contiguous tracts.

The largest tracts are clustered around Freeman Ranch and the SW corner of the County. Some of these properties may stay in existing agriculture use for generations, others may be put into conservation. For those that are developed, conservation design offers an opportunity to create amenities for the development's residences, while preserving the important conservation resources found on site.

Jurisdiction	Acres in Hays Co. City	*ETJ*	20–100 ac City	*ETJ*	100–320 ac City	*ETJ*	320–640 ac City	*ETJ*	640–1,280 ac City	*ETJ*	>1,280 ac City	*ETJ*	total
Unincorporated Area	183,621		765		209		46		17		9		1,046
Austin	482	*6,895*	4	*27*	-	*9*	-	*1*	-	-	-	-	41
Bear Creek	685	-	-	-	-	-	-	-	-	-	-	-	-
Buda	5,926	*8,007*	17	*20*	7	*8*	-	*1*	-	*2*	-	-	55
Creedmoor	438	*14*	1	-	3	-	-	-	-	-	-	-	4
Dripping Springs	5,364	*65,746*	20	*222*	6	*55*	1	*15*	-	*2*	-	*1*	322
Hays	135	*2,993*	-	*3*	-	-	-	*1*	-	-	-	-	4
Kyle	19,513	*24,372*	56	*85*	15	*19*	3	*2*	-	*4*	2	-	186
Mountain City	269	*3,558*	1	*17*	-	*4*	-	*1*	-	-	-	-	23
Mustang Ridge	-	*107*	-	*2*	-	-	-	-	-	-	-	-	2
Niederwald	2,105	*6,958*	4	*42*	-	*9*	1	*1*	1	-	-	-	58
San Marcos	19,715	*48,691*	81	*221*	14	*62*	2	*7*	1	*5*	-	*2*	395
Uhland	1,339	*3,117*	7	*23*	1	*10*	-	-	-	-	-	-	41
Wimberley	5,637	*15,884*	20	*123*	1	*19*	-	*1*	-	*1*	-	-	165
Woodcreek	687	*2,011*	5	*4*	-	*2*	-	-	-	-	-	-	11
County Total	**434,270**		**1,768**		**454**		**83**		**35**		**14**		**2,354**

Table 1. Parcel Size counts by jurisdiction. Counts include any parcels over 20 acres that are at least 50% within a given jurisdiction. The county total includes all parcels over 20 acres within the county.

There are 14 parcels over 1,280 acres within Hays County. The largest of which is a 5,102-acre property owned by Needmore River Ranch LLC, located between Wimberley and San Marcos. It is also adjacent to Freeman Ranch and is clustered with two other large properties owned by Ingram Ranches I Ltd (3,411 and 1,439 acres, primarily within San Marcos ETJ). The smaller of the two Ingram parcels is also adjacent to the La Cima preserve. Together, this cluster of large parcels and existing open space is one of the largest undeveloped areas in the County. Two of the other parcels over 1,280 acres are located within the city limits of Kyle. One is in the ETJ of Dripping Springs, and the remaining eight are primarily in unincorporated areas, though two fall partially within the Wimberley ETJ. The parcel in the Dripping Springs ETJ is adjacent to a network of Water Quality Protection Lands under easement or owned by the City of Austin, again presenting an opportunity to expand upon existing protected open space.

There are 35 parcels in the next largest size class (640–1280 acres). Of those, 17 are at least 50% within unincorporated areas. The San Marcos ETJ contains five of them, the City of San Marcos contains another one, and the Kyle ETJ contains four. Several of these large parcels in Kyle surround an existing Nature Conservancy conservation easement.

Parcels in the 100-320 and 320-640 acres categories are found between Dripping Springs and Wimberley and along the eastern border of the County. These parcels offer the opportunity to add substantial acreage to the already conserved lands that lie between Dripping Springs, Wimberley, and Buda.

Parcels from 20 to 100 acres are found throughout the County. These are typically the parcels that lie the furthest from the largest parcels. Due to their location and the volume of these smaller parcels, they provide the opportunity to create meandering corridors to connect conserved areas.

WATER RESOURCES

Aquifer Recharge Zones

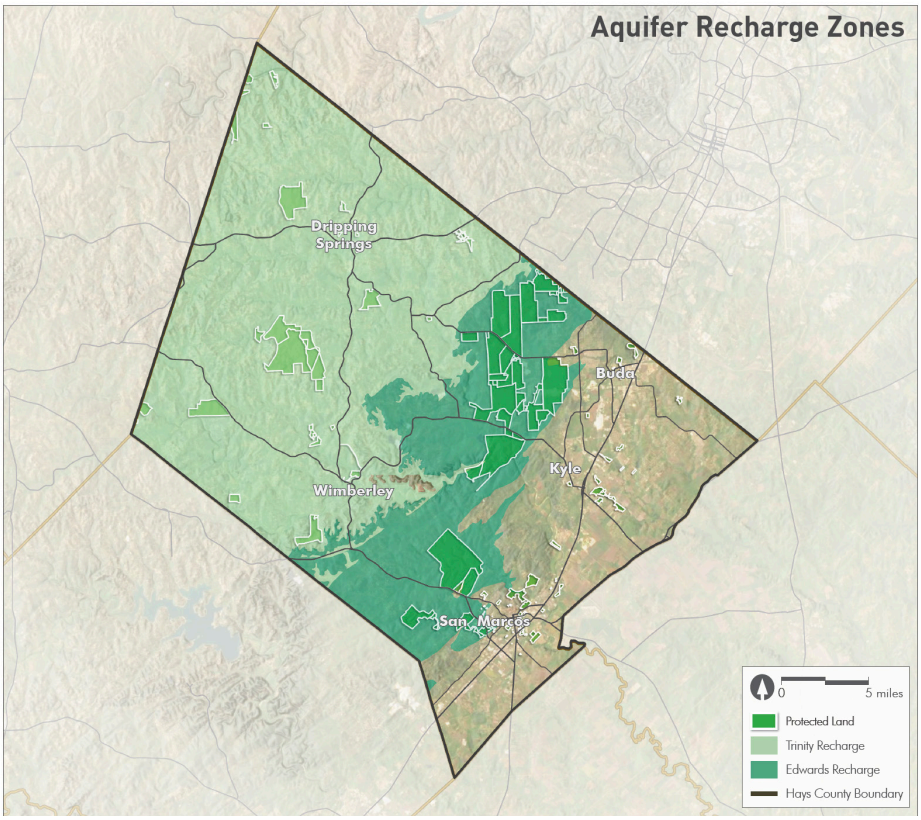
Conservation of land in aquifer recharge zones helps protect the quality and quantity of water entering aquifers, which are the source of water for springs in the area. Impervious cover should be limited in these environmentally sensitive areas. Conservation developments, in comparison with traditional subdivision developments, offer reduced impervious cover and associated infrastructure like roads, curbs, sidewalks, and stormwater piping. Therefore, if development must occur in these areas, prioritizing conservation development with limited impervious cover, along with other water protection considerations, is recommended.

Mapping Criteria

Major Aquifers shapefile downloaded from the Texas Water Development Board.

Summary

The Trinity Aquifer Recharge Zone lies in the northwestern part of the County and the Edwards Aquifer Recharge Zone lies in a comparatively thinner central band within the County. Together, these aquifer recharge zones cover a cover a combined 320,174 acres, nearly 75 percent, of Hays County. The Trinity Aquifer Recharge Zone (TARZ) is 224,734 acres in the western half of the county. While the Edwards Aquifer Recharge Zone (EARZ) is 95,440 acres and lies directly to the east of the TARZ.



Karst Areas

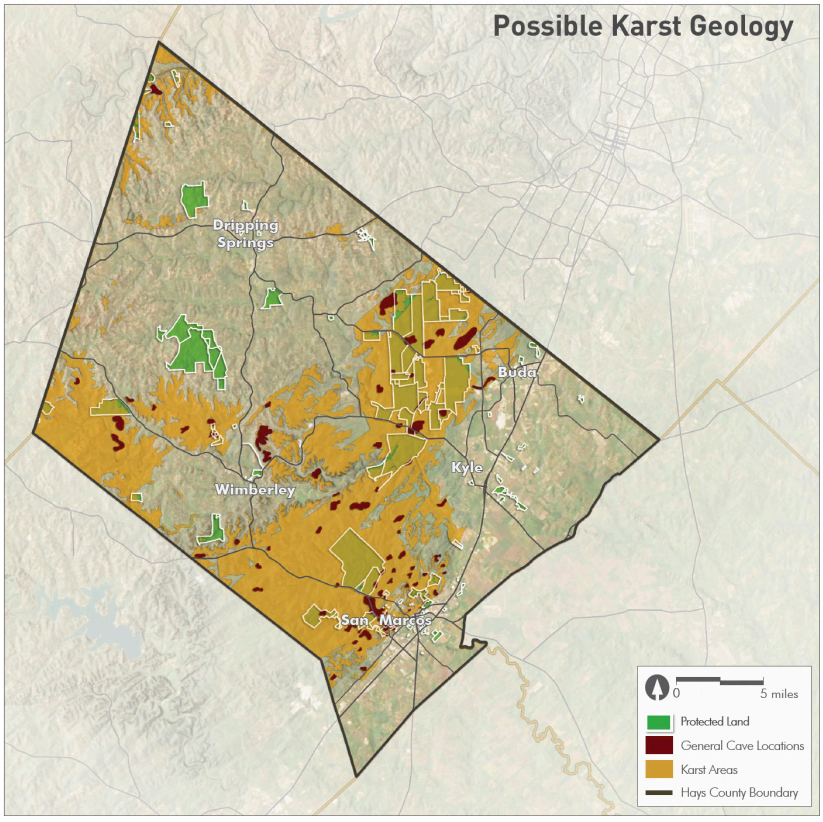
Karst areas and general cave locations are included because these sensitive features have important implications for water quality and also provide unique wildlife habitat. There are 6 federally protected endangered species in Hays County that rely on either terrestrial or aquatic karst habitat: the Barton Springs, San Marcos, and Texas Blind salamanders, along with the Comal Springs dryopid beetle, the Comal Springs riffle beetle, and the Peck's Cave amphipod. Additionally, there are over 40 karst-dwelling species listed as either Evaluation or Additional species in the Hays County Regional Habitat Conservation Plan (RHCP). Conserving land around karst features such as caves, sinkholes, and solution cavities protects these species by reducing the potential for sediment and contaminated water entering their habitat. These are areas of porous rock, where water percolates quickly through the soil into the groundwater below, with little filtration. Maintaining intact vegetation around these features can help slow down and filter water. Development and its associated impervious cover should be minimized in these areas. When development must occur, it should be as environmentally conscious as possible and use best management practices for water quality.

Mapping Criteria

Karst formation locations and general cave locations mapped by Zara Environmental.

Summary

There are 78 general cave locations identified within the 139,934 acres classified as karst formations. The majority of protected lands in the County overlay these karst areas, though a few clusters surrounding Dripping Springs do not.



Spring Buffers

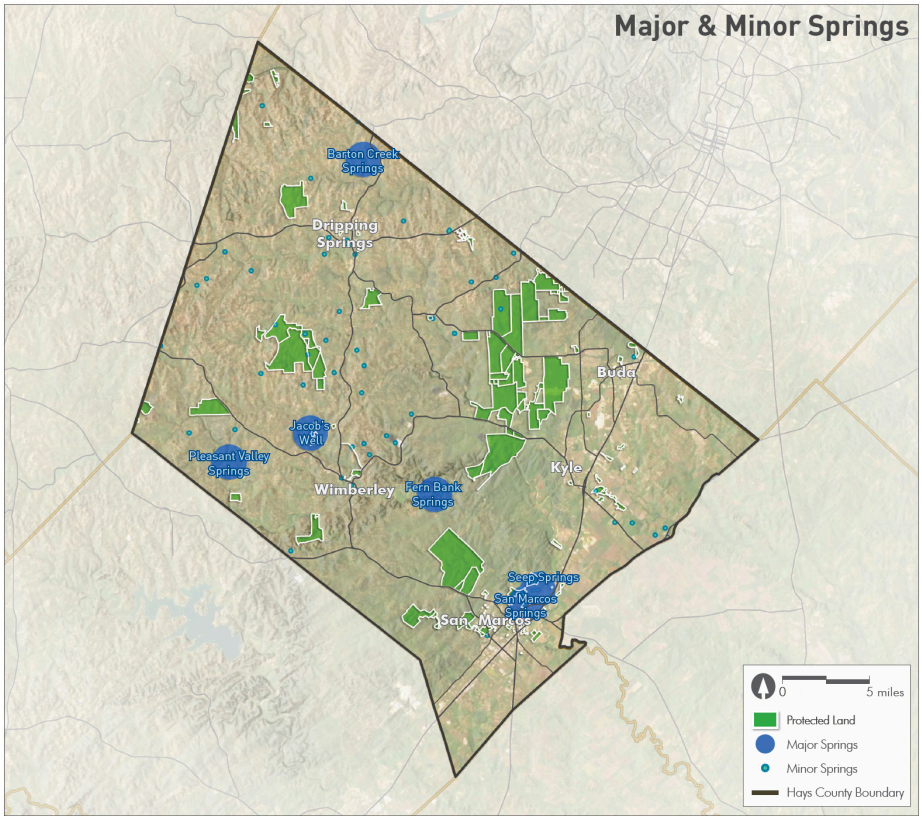
Buffers were placed around springs to promote the conservation of groundwater and maintain spring flows. The Austin municipal code was a precedent for buffer size around minor springs for this project. In it, springs are grouped with a range of other critical environmental features including caves, sinkholes, canyon rimrocks, and bluffs. All of these are considered crucial to the protection of water quality due to their high susceptibility to pollution. A larger buffer is placed around major springs for added protection of water quality and habitat. These buffers are an added layer of protection for these sensitive areas. Spring buffers should be considered when designing conservation developments, as they can be leveraged to either help protect land within the spring buffer or planned to avoid these sensitive areas.

Mapping Criteria

A 350-foot buffer was placed around minor springs (sourced from the Texas Parks and Wildlife Department). A one-mile buffer was placed around major springs (sourced from the US Geological Survey with additions based on information from Doug Wierman).

Summary

There are 6 major springs and 60 minor springs identified within Hays county. Many of these areas do not coincide with expansive protected lands.



Public Water Supply Well Buffers

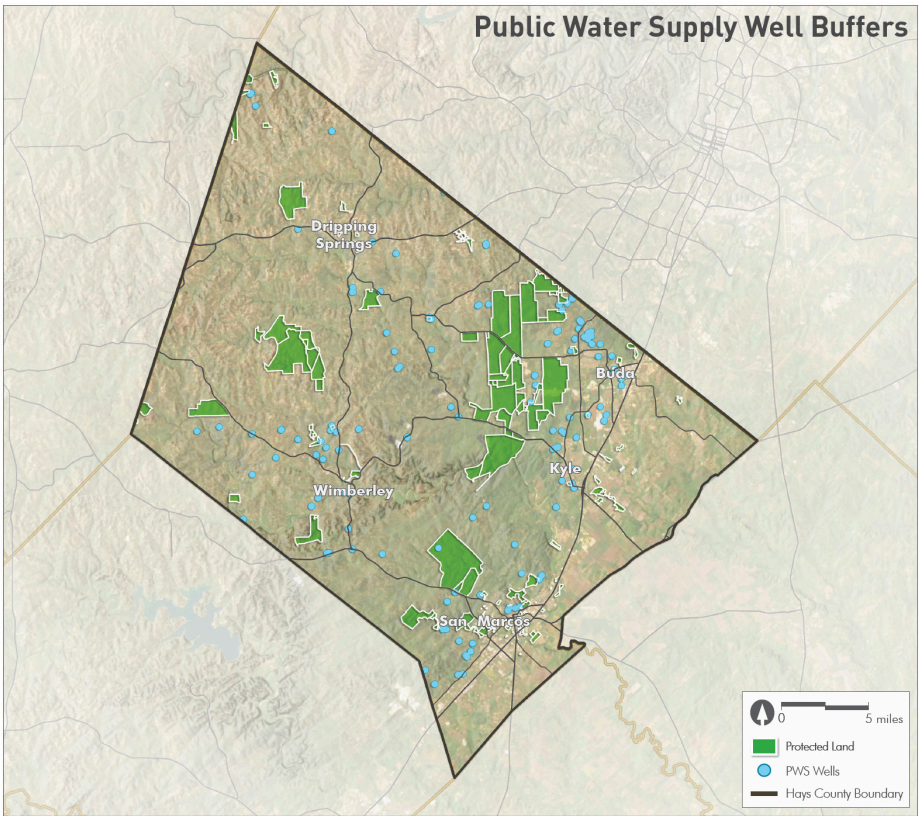
Buffers around public water supply wells help maintain and improve public water supply critical to long term community health and development. Land use within well buffers tends to be highly restricted due to the potential for water contamination. Restricted land uses in Texas include wastewater management and animal feeding operation holding pens. These are just a couple examples of a wide range of land use restrictions that should be considered in order to protect water quality within well buffers. These buffers relate to conservation developments because building within them will require careful planning around restricted land uses.

Mapping Criteria

A 1,000-foot buffer was placed around wells (sourced from the Texas Commission on Environmental Quality (TCEQ)).

Summary

There are 180 public water supply wells in Hays County. They are all west of I-35 and primarily loosely clustered around municipalities. The majority of these do not intersect with protected land.



Floodplains

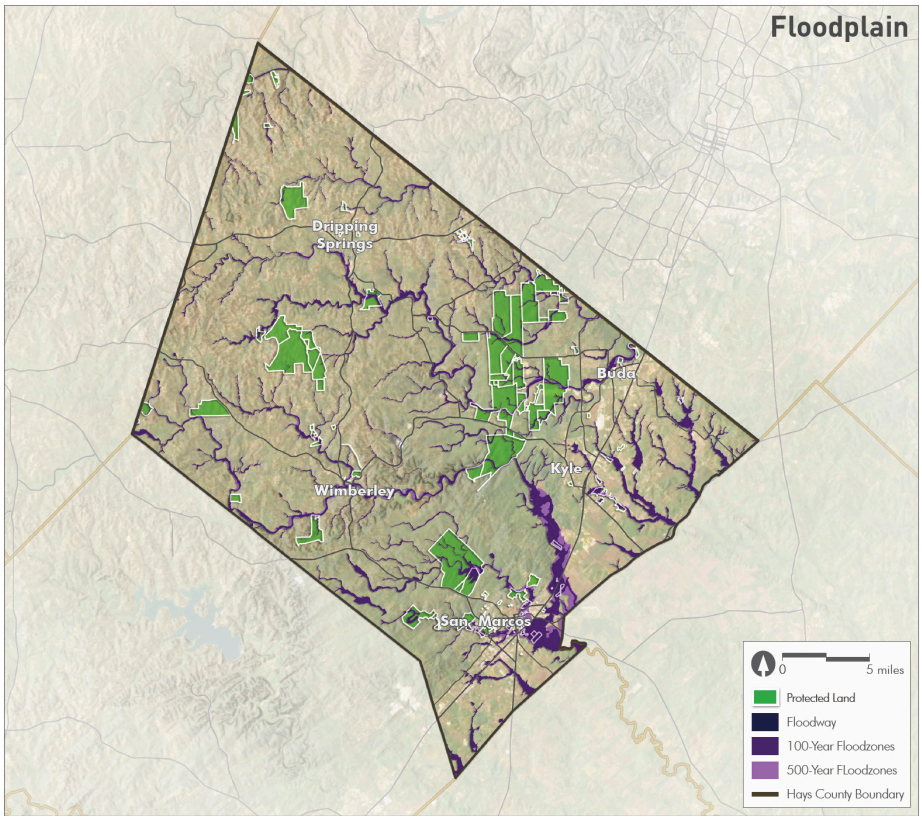
These areas of high flooding potential are critical for maintenance of water quality, erosion control, bank stability, and riparian habitat. Development in these areas is also subject to damage by flooding and is therefore often limited by regulations. Prioritizing low infrastructure developments and open space solutions in these areas is recommended. Waterfront parks in floodplains is one way to make use of the space, while still accruing the benefits of open space in the floodplain and avoiding the negative impacts of damage during storm and flooding events.

Mapping Criteria

Floodway, 100-, and 500-year floodplains as mapped by Hays County. Data provided by Hays County and considered the best available as of September 2020.

Summary

Floodplains lie throughout a significant portion of the County. The 500-year floodplain includes 38,017 acres. Almost all of that area is also within the 100-year floodplain (37,635 acres), and 7,649 acres are within the floodway. The widest floodplain areas occur between Kyle and San Marcos along the lower Blanco River and at its confluence with the San Marcos River. Nearly all protected lands intersect with some part of a floodplain. However, strategic placement of these protected lands along the length of the floodplain would be more beneficial to the _____.



Water Quality Buffers

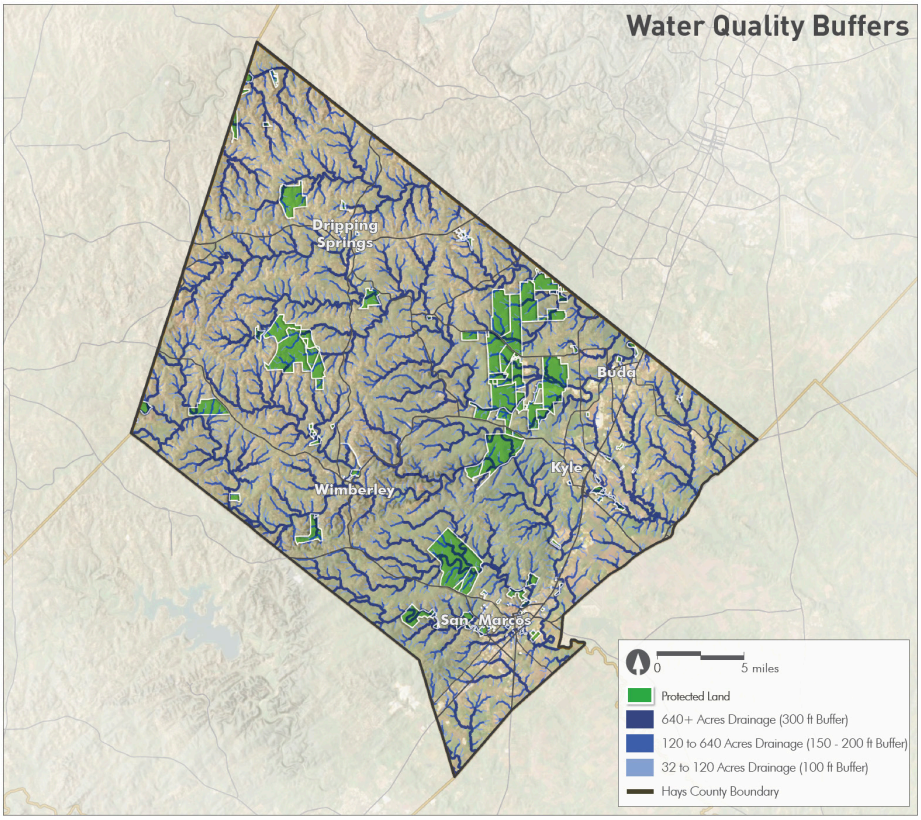
Water quality buffers are important for water filtration, erosion control, and bank stability. They also help keep stream habitats healthy for a variety of aquatic species, including several federally protected species of mussels. Conservation developments can support water quality buffers by promoting and planning open space, while avoiding development with significant impervious cover within them.

Mapping Criteria

National Hydrography Dataset Plus flow accumulation was used to define catchment areas. Buffers were created around flowlines based on the following catchment area classes: 32–120 acres received a 100-ft buffer; 120–200 acres received a 150-ft buffer; 300–640 acres received a 200-ft buffer; and over 640 acres received a 300-ft buffer.

Summary

In total, Water Quality Buffers cover 76,062 acres of Hays County. They are distributed throughout the county. All major protected lands intersect a water quality buffer.



CULTURAL RESOURCES

Adjacency to Protected Land

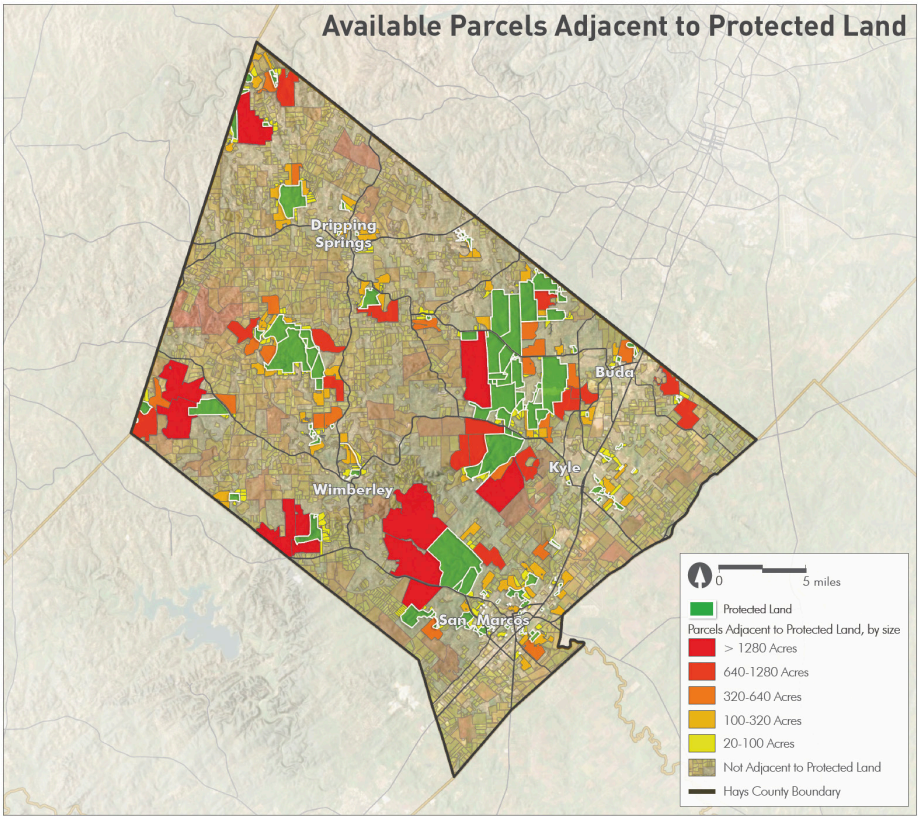
Managing adjacent properties is one of the most efficient and effective ways to increase the impact of conservation lands. Not only does proximity create connections between protected areas across the landscape, it also creates more robust habitat, offers additional wildlife migration routes, can reduce management costs, and can provide for greater recreational opportunities. These areas can be incorporated into conservation developments to promote the creation of larger nodes of conservation that are more effective in protecting resources, supplying environmental services, and creating corridors of open space.

Mapping Criteria

Existing protected land data was compiled by starting with the Texas Land Trust Council's Conservation Land Inventory and editing based on communication with team members and with representatives from several conservation organizations active in the County. A buffer of 400 feet was then used to identify available parcels next to existing protected land.

Summary

There are 292 parcels considered available for conservation development that are adjacent to protected land. This includes 10 of the 14 parcels over 1,280 acres within the county along with 16 parcels in the 640 to 1,280-acre range. All protected lands have adjacent parcels that are available for future protection.



Trails

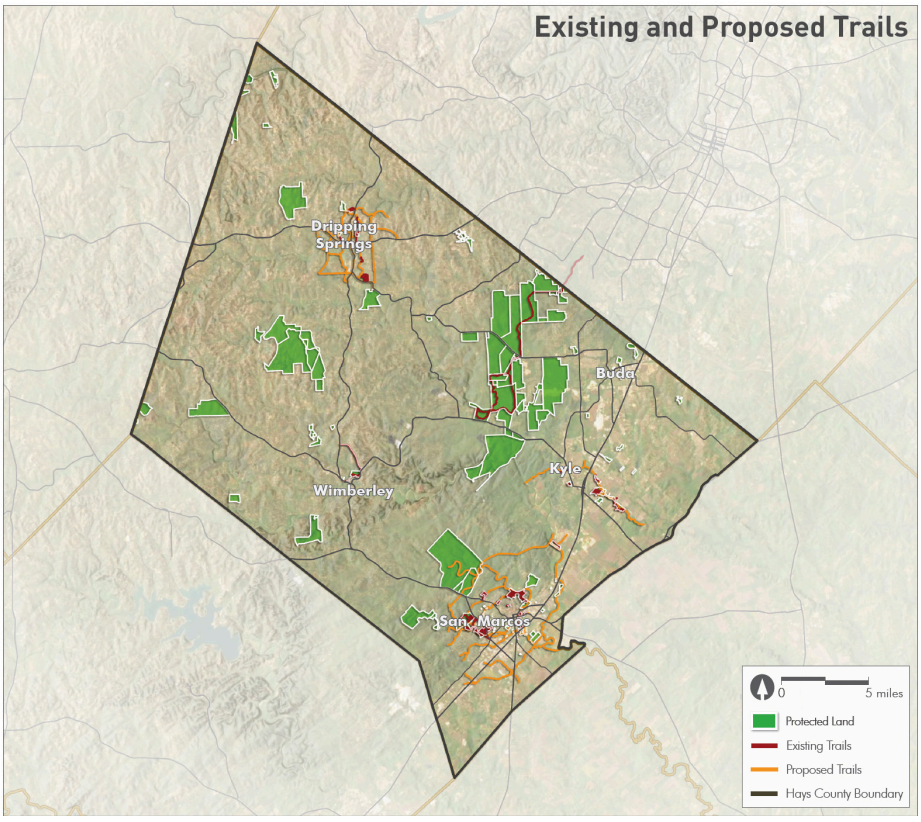
Knowledge of existing and proposed trail locations can help prioritize future conservation in areas lacking trails as well as areas where new trails could connect and expand existing trail networks.

Mapping Criteria

Existing and proposed trail locations were compiled based on data from individual municipalities along with files in Siglo Group's database. Additional trail data is needed.

Summary

There are 66.9 miles of existing trails mapped in Hays County along with another 112.5 miles of proposed trails. If all proposed trails were completed, the total would be 179.4 miles. The trails currently included in the dataset are in either the city limits or ETJs of Kyle, San Marcos, Dripping Springs, Wimberley, Woodcreek, and Austin. Generally, existing and proposed trails lie in and around cities like Dripping Springs, Kyle, and San Marcos. Two exceptions are the existing trails north of Wimberley and between Buda and Dripping Springs. The majority of existing trails are within protected land, while many of the proposed trails cross areas that are not currently protected.



Growth Areas

Growth areas are expected to be impacted in the coming decades by continued urban and suburban expansion. Land use change and fragmentation are expected to follow existing patterns, in which subdivisions and intense land use radiates out from municipalities and existing road corridors. Due to the connectivity of growth areas to previously developed zones, which may have high amounts of impervious cover and habitat disturbance, future development in these zones may require special considerations. For example, conservation design may be especially important in these areas to curb some of the negative ecological impacts of that expansion.

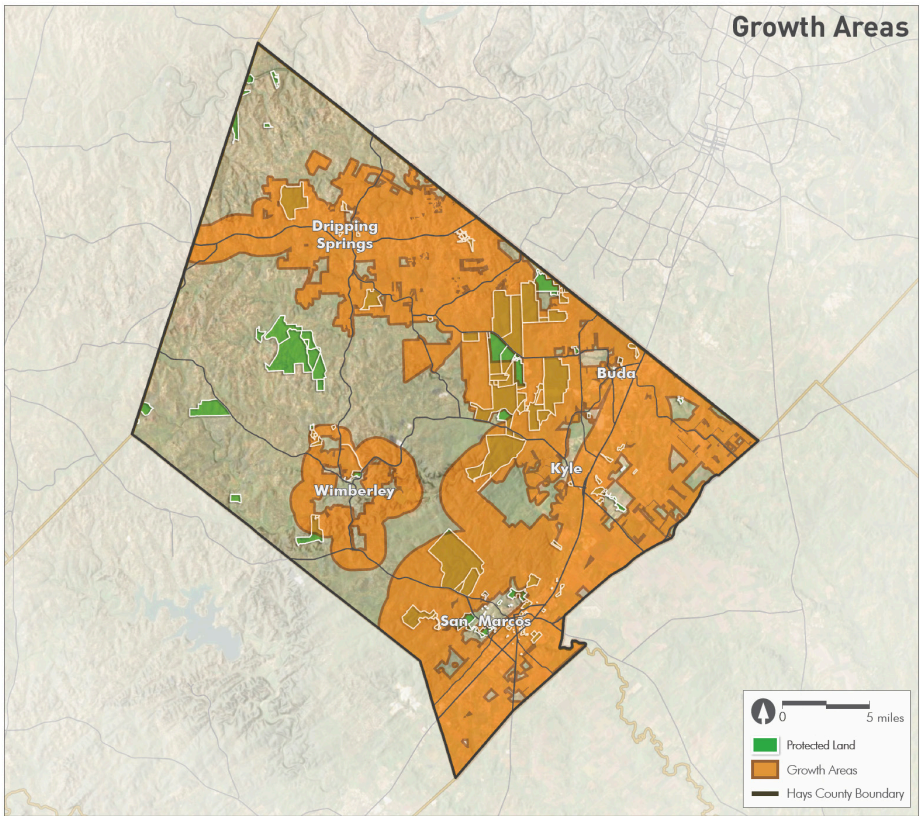
Mapping Criteria

Extraterritorial Jurisdiction (ETJ) boundaries were combined with a one-mile buffer around I-35 and US 290.

Summary

The Growth Area covers 220,327.2 acres, over 50 percent of Hays County. Growth areas surround all major cities in the County: Wimberley, Dripping Springs, Buda, Kyle, and San Marcos. The growth areas around the latter four is contiguous, stretching from the southern tip of the County, along the eastern border, and extending west across Dripping Springs to the western border. Many large clusters of protected lands coincide with these growth areas, which is a strength within the County.

However, there are several gaps of protected lands within growth areas, such as areas to the east and west of Dripping Springs, surrounding Wimberley, and areas east of Buda, Kyle, and San Marcos where growth is expected but few conserved lands currently exist.



Prime Farmland Soils

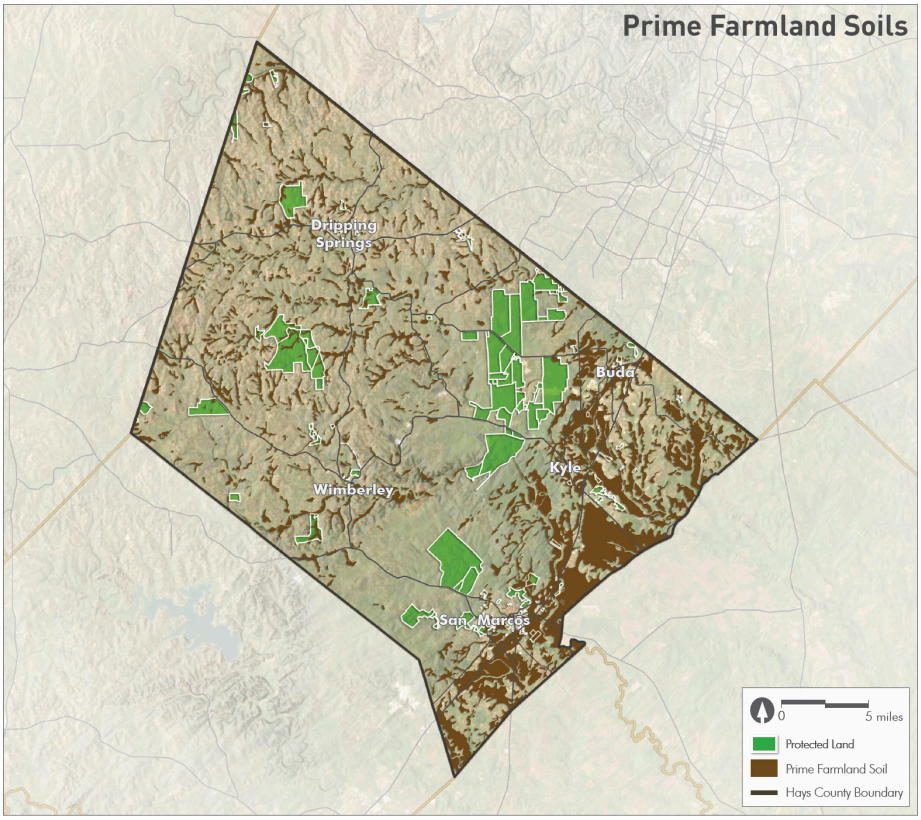
Prime farmland soils play a crucial role in a robust agricultural system and are an indicator of areas more likely to qualify for state and federal protection programs. These areas are significant to the future of productive agriculture throughout the country. As development increases and a growing populations' demand for food rises, these fertile soils will become even more important. Additionally, ranching is a prominent cultural cornerstone throughout Texas. Prime farmland soils offer immense cultural and economic value, while also providing the open space that many wildlife species consider home. By being aware of the location of prime farmland soils, conservation developments can help protect them and possibly leverage state and federal resources.

Mapping Criteria

Areas considered significant for agricultural production as defined by Natural Resource Conservation Systems were used.

Summary

Hays County contains 76,180 acres of prime farmland soil. Prime farmland soils are scattered throughout the County but are concentrated in the eastern edge of the County. Many protected lands do not contain prime farmland soils, making future protection of these soils all the more important.



Potential Archaeological Sites

Prehistoric archeological sites, especially those eligible for the National Register of Historic Places, are an important part of Central Texas's rich culture. These areas should be considered and surveyed before development to make sure construction sites won't impact archeological sites. Additionally, these areas can be preserved and protected within the conservation development, if done so carefully and in collaboration with local county officials and other relevant entities.

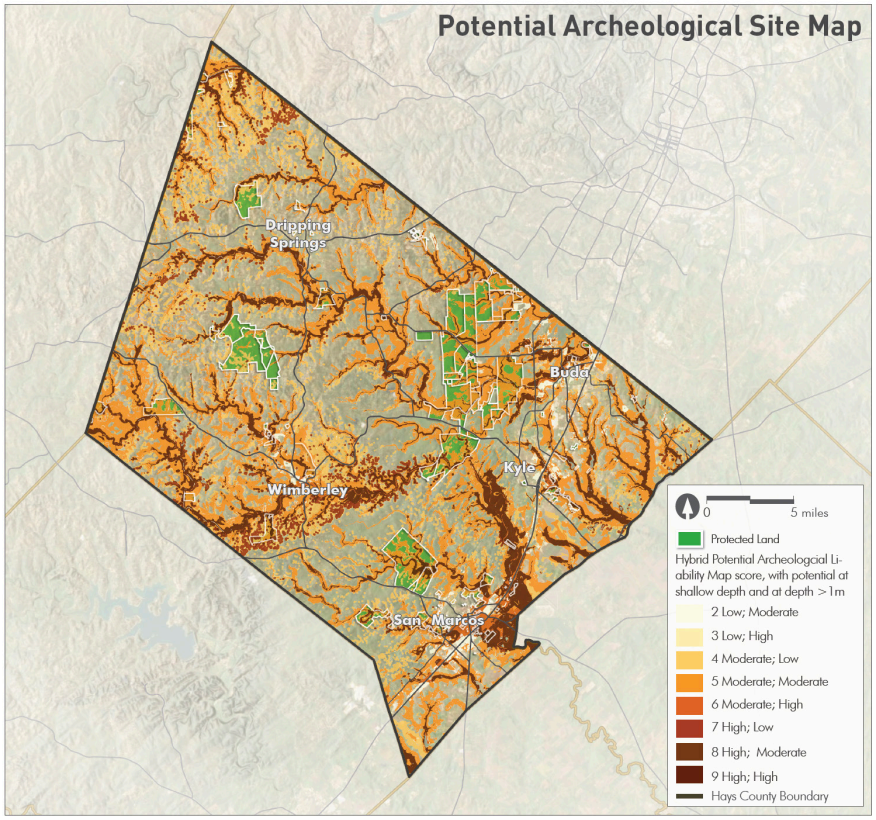
Mapping Criteria

The Hybrid Potential Archeological Liability Maps (HPALM) produced by the Texas Department of Transportation model the likelihood of prehistoric archeological sites to be preserved either near the surface or at a lower depth. All areas with an HPALM score of 2 or higher were included as these scores represent moderate or high potential at one or more depths. The scores represent the following likelihoods of prehistoric archeological sites:

2 = Low Shallow Potential, Moderate Potential at Depth (>1m)
3 = Low Shallow Potential, High Potential at Depth
4 = Moderate Shallow Potential, Low Potential at Depth
5 = Moderate Potential
6 = Moderate Shallow Potential, High Potential at Depth
7 = High Shallow Potential, Low Potential at Depth (>1m)
8 = High Shallow Potential, Moderate Potential at Depth
9 = High Potential

Summary

There are 248,278 acres within the County with an HPALM score of 2 or higher. Of that area, 37,989 acres have a score of 9 (High Potential). Many protected lands in the County coincide with some level of potential archeological liability.



ECOLOGICAL RESOURCES

Riparian and Floodplain Vegetation

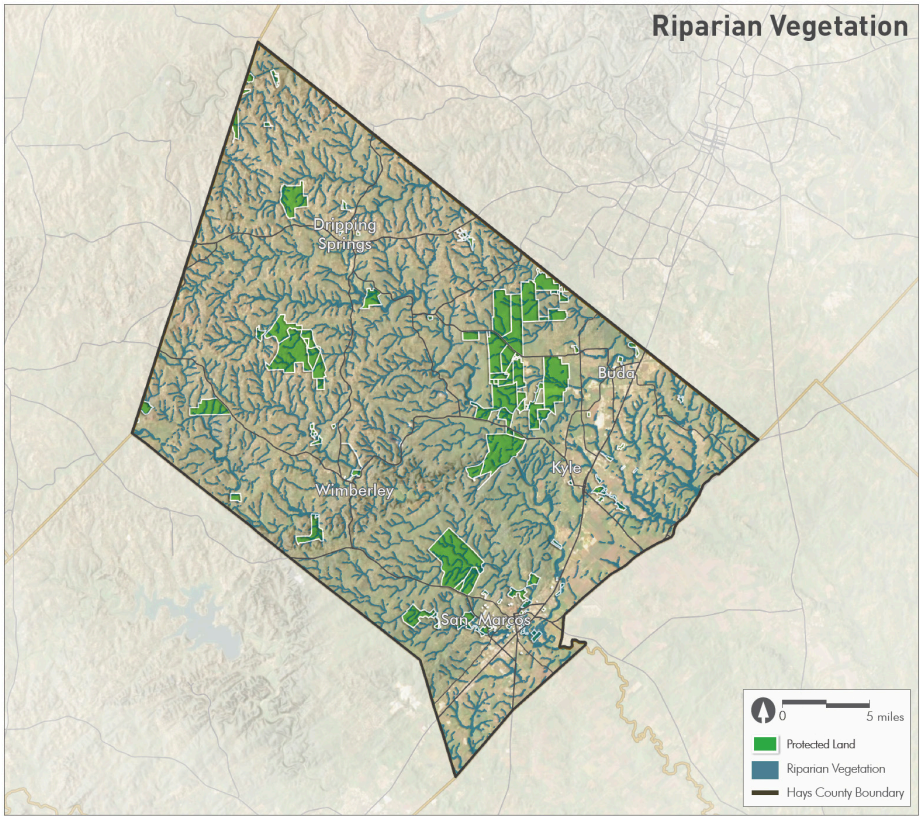
Riparian plant communities offer important water quality benefits, erosion mitigation, and high-quality wildlife habitat. Density, coverage, and root mat continuity all provide protection of the bank from erosion and overland flows. These features also provide riparian habitat that support both terrestrial and aquatic fauna. Bank vegetation provides canopy cover, which has a cooling effect on the water and dictates what species can thrive in these microclimates. Additionally, upland vegetation in riparian zones is often distinct from more upland areas, providing habitat for unique species that only nest along a small band of riparian corridor. Within conservation developments, these areas should be preserved and maintained for upmost ecological health. This may include plantings, removal of invasive species, and protection from foot traffic.

Mapping Criteria

Areas defined as riparian or floodplain plant community types in the Texas Ecological Mapping Systems were used.

Summary

There are 28,309 acres identified as riparian or floodplain plant communities in Hays county. Some riparian vegetation coincides with protected land, but there is much riparian vegetation that remains unprotected.



Steep Slopes

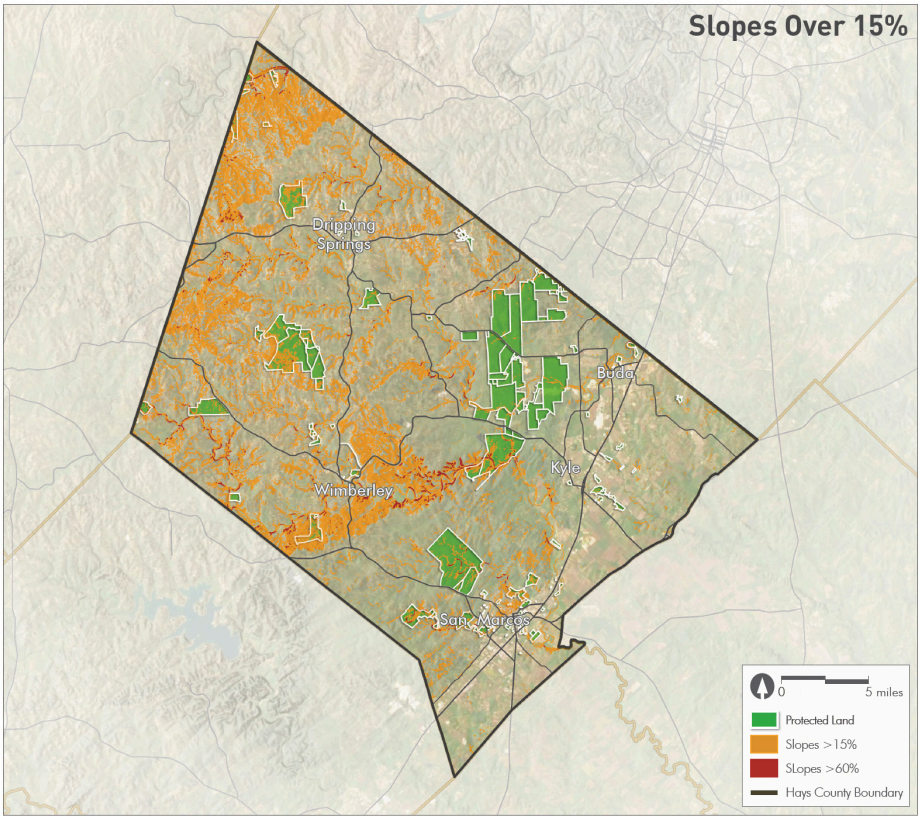
Steep slopes serve as surrogates for areas with endemic species and are also more susceptible to erosion and increased stormwater velocities. Construction of impervious cover and land use activities in the upslope area adjacent to steep slopes can result in increased velocity and frequency of surface water runoff flowing over these slopes. The erosion caused by the increased runoff carries sediment into down-gradient waterways and can result in slope instability. The sediment can also carry contaminants that accumulate in the waterways downstream.

Mapping Criteria

The map includes areas with slopes 15–60 percent and slopes >60 percent.

Summary

There are 35,401 acres of 15–60 percent slopes and 512 acres >60 percent slopes. Steep slopes are more common in the western half of the County and are particularly prominent north of Dripping Springs and near Wimberley along the Blanco River. Protected lands in the western half of the County largely coincide with these steep slopes.



Terrestrial Fauna Ecological Index

Lands have varying ability to support wildlife species depending on a variety of factors including plant community, slope, disturbance level, and proximity to water. Conservation developments can help preserve lands that support a particularly rich array of wildlife species by considering the potential species of conservation concern habitat and establishing protected lands within them.

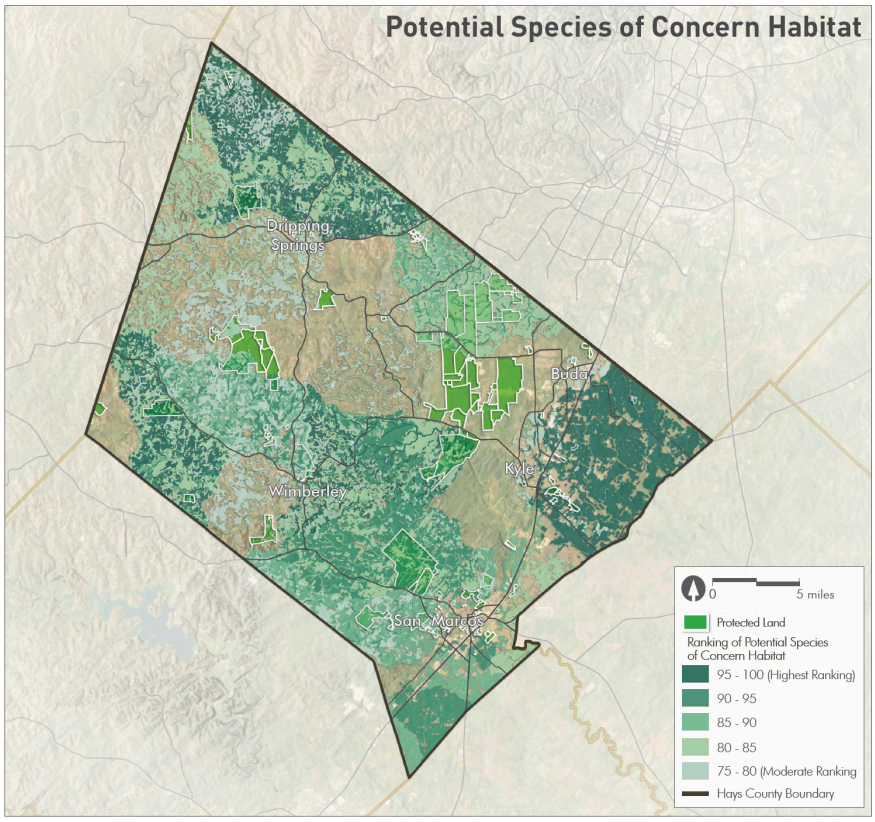
Mapping Criteria

The potential species of conservation concern habitat was measured by proxy via the Terrestrial Fauna Ecological Index (TFEI) score, which was produced by Texas Parks and Wildlife as a way to identify lands that are important for the conservation of a broad range of focal species – a subset of the larger Species of Greatest Conservation Need list identified in the 2012 Texas Conservation Action Plan. For each focal species, the dataset combines the likelihood that a species occurs in a given watershed with the potential of that species using a given type of habitat in the TPWD Ecological Mapping Systems (EMS) dataset. The scores for all focal species in an ecoregion are then combined to assign a TFEI score to each EMS unit. A high TFEI score therefore represents an area that is potentially valuable habitat for numerous focal species.

Terrestrial Fauna Ecological Index scores for Texas Blackland Prairie and Edwards Plateau ecoregions were each normalized from 0 to 100, then combined. All areas with normalized scores of 75 or more are included here.

Summary

There are 223,999 acres with a normalized Terrestrial Fauna Ecological Index score of 75 or more. These areas are spread throughout the county, with a notable gap in the area from Kyle to Dripping Springs. This gap includes several large clusters of protected lands.



Golden-Cheeked Warbler Habitat

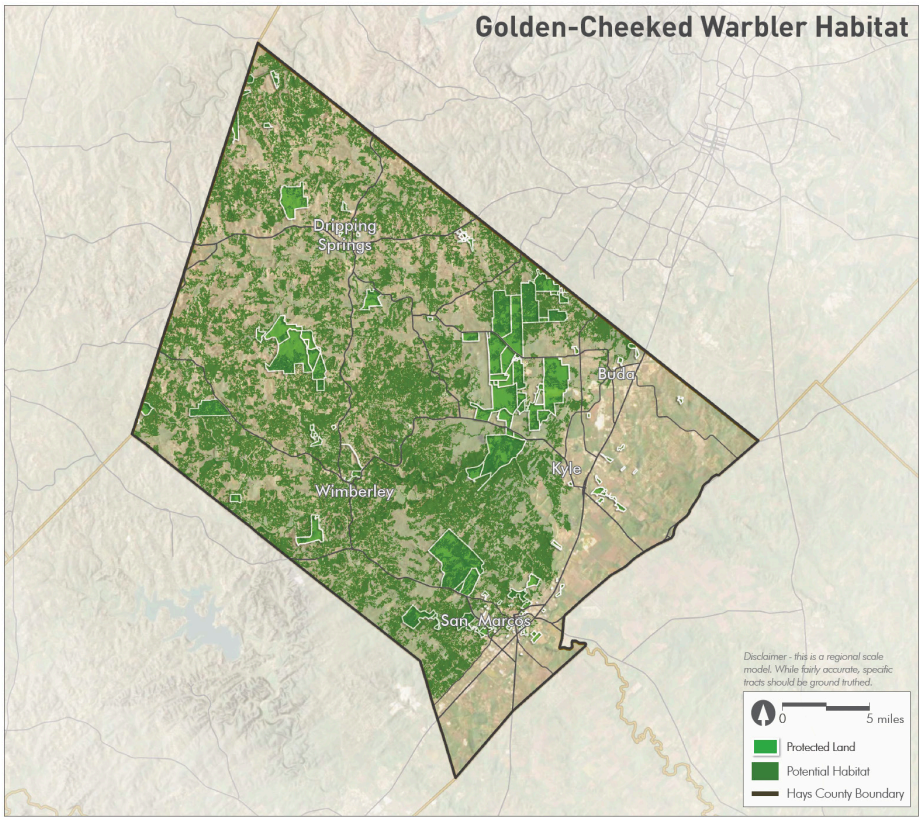
The Golden-cheeked Warbler is a federally listed endangered species whose sole location for nesting is in the oak-juniper woodlands of Central Texas. After nesting in Central Texas during the spring and summer months, the Golden-cheeked Warbler migrates to and winters in Central America. This bird requires older growth forest with a denser tree canopy where they can forage for a variety of insects, including caterpillars. Hays County has a regional habitat conservation plan for this species. Conservation developments can not only participate in the HCP for potential impacts but also contribute to habitat preservation. This plan focuses on mitigating impacts to species as well as regional scale habitat conservation. Conservation developments can help protect Golden-cheeked Warbler habitat by bringing parts of their habitat into conservation and working to restore degraded areas of habitat. These mapped areas offer potential habitat for the endangered Golden-cheeked Warbler.

Mapping Criteria

Areas that were habitat in 2010, became habitat in 2010, or were habitat in 2000 but not in 2010 as designated by the Duarte 2013 model.

Summary

There are 180,301 acres mapped as Golden-cheeked Warbler habitat in Hays county. Because of habitat features found in the Edwards Plateau ecoregion, all Golden-cheeked Warbler habitat is located within that ecoregion, which occurs to the west of I-35. The densest areas lie between San Marcos, Kyle, Buda, and Wimberley. A majority of protected lands coincide with some type of Golden-cheeked Warbler habitat.



COUNTY-DIRECTED
CHARGE

Being a county with such a unique natural landscape, home to the celebrated Texas Hill Country, as well as vanishing prairie land, with an abundance of rivers and streams, it's no wonder the Hays County Commissioners Court and other elected officials were keen to find alternative ways to protect this precious land. Chapter 765 – which details the current legal process to certify a conservation development within the County's Development Standards – has not been used as it was initially intended. To date, there has yet to be one true conservation development built in Hays County using these regulations as the foundation. While the current regulations include a number of good ideas and beneficial goals, the standards are too restrictive, require excessive permits and submittals, and do not provide sufficient incentives to efficiently promote and encourage conservation development, especially given the regulatory "extras" required as part of the process. Simply, there is no compelling reason for a developer to choose conservation design over the traditional subdivision design and regulatory process. There are, in fact, disincentives. Hays County staff and elected officials recognized this contradiction. In the spring of 2020, following a public, competitive procurement process, reviewed and rated by technical staff, the County's Commissioners Court selected the top-scoring team, a multi-disciplinary group composed of urban planners, civil engineers, conservation scientists, finance experts, landscape architects, and GIS mappers, led by Gap Strategies. The team was charged with working closely with County staff to reimagine the existing conservation development standards and lead a public process to find innovative ways to catalyze conservation-oriented development across the County.

Since county regulatory authority is limited due to Texas state law, the County's conservation development standards only apply to unincorporated areas within Hays County. Although some county standards are typically adopted by some city jurisdictions across the County, that is not ensured. Over time, Hays County and local city governments will need to work collaboratively to create a seamless patchwork of conservation guidelines to govern development in extraterritorial jurisdictions (ETJs) and inside city corporate limits, through "SH 45" agreements, interlocal

agreements, complimentary orders and ordinances. Meanwhile, though County Commissioners and staff recognize this lack of reach beyond the unincorporated portions of the County, and the limitations of regulation within ETJs, the planning team and the County see this report – and the County policies it is meant to foster – as precedent for effectively attracting, incentivizing, and encouraging conservation development throughout the County's remaining pristine open spaces.

Commissioners were instrumental to the development of this final report and greatly contributed to feasibility studies, and to the structuring of final recommendations. County Commissioners participated in all public engagement campaigns and even actively assisted in helping answer questions during the Randall Arendt Conservation Development virtual workshop that was held in October 2020. Staff and Commissioners also worked alongside the professional team during the multi-day charrette to test draft standards on two different properties within the County. Throughout the entirety of the project, County staff from the Development Services and the Natural Resources departments, and from the general counsel's office, worked with the professional team to research, review, and analyze the best available data, to facilitate stakeholder and community involvement, and ultimately assist in the refinement of the final recommendations. It is the County's dedication to land conservation – preserving the natural jewels that make this County an attraction for everyone – that made this study, and the presentation of these recommendations for augmented guidelines, possible.

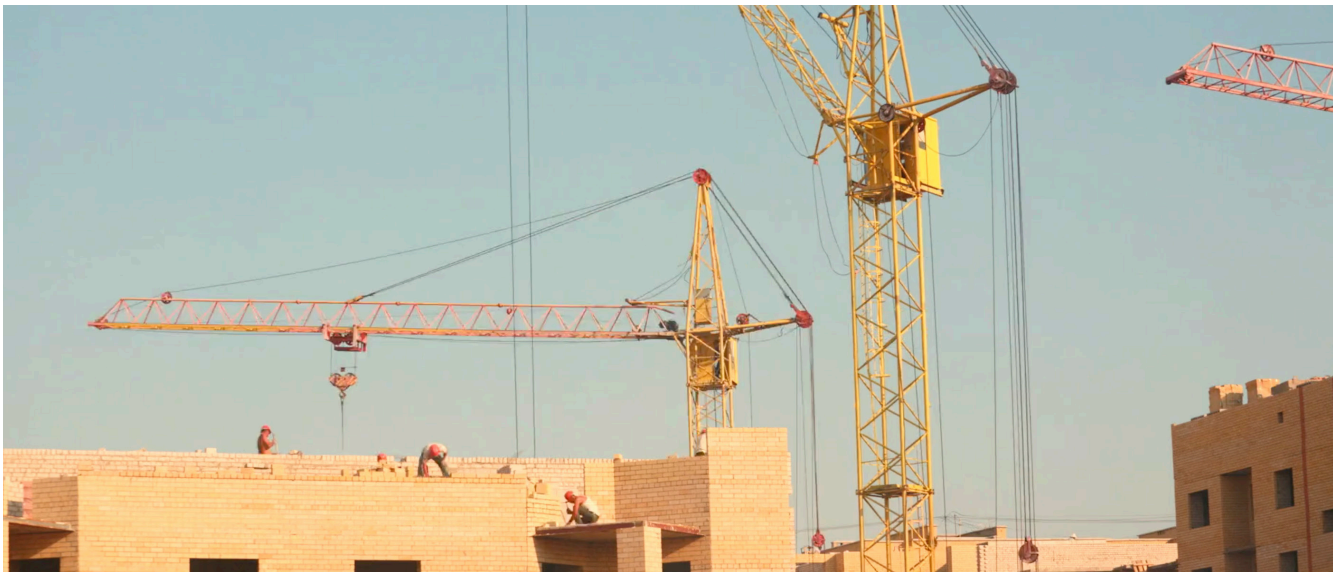
CHAPTER 2

HOW CONSERVATION DEVELOPMENT HAS WORKED WITHIN THE US: A PROVEN MODEL

LATEST WIDE-REACHING

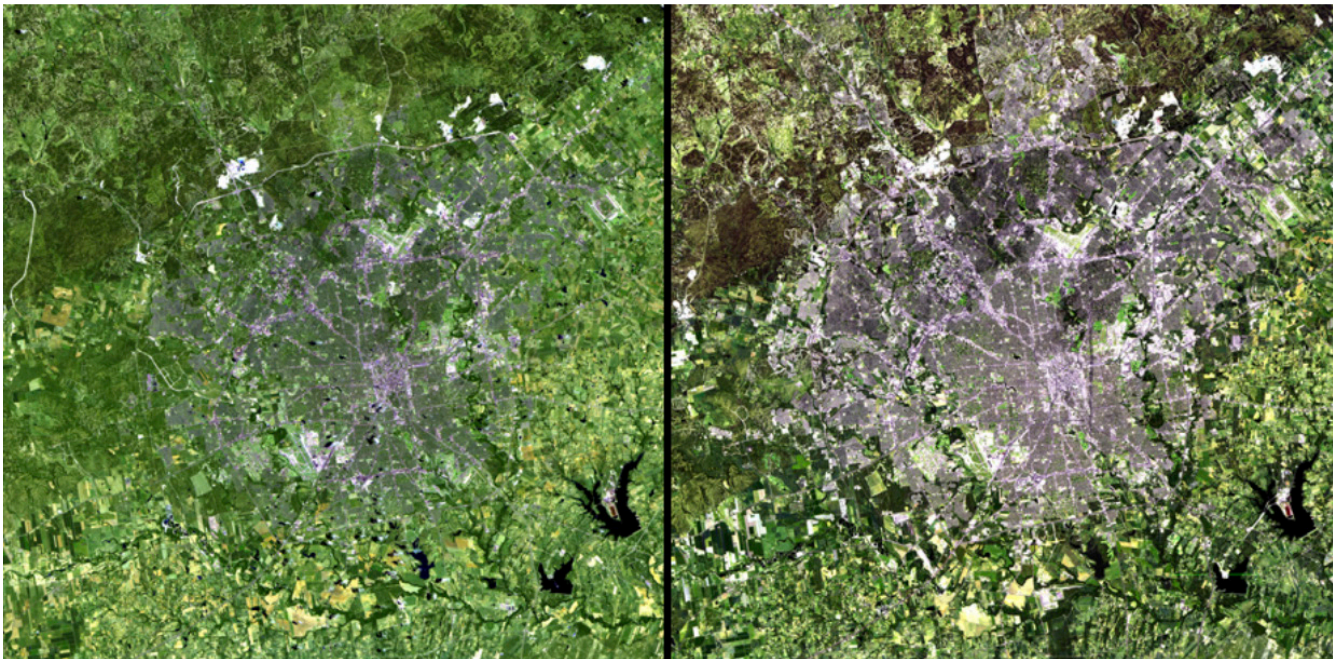
RESEARCH ENCOURAGES CONSERVATION DEVELOPMENT

Trends in land use, building patterns, and travel behavior highlight how significantly our development patterns have changed in recent decades. The size of virtually every major metropolitan area in the United States has expanded dramatically. In many places, the rate of land development has far outpaced the rate of population growth, although more recent trends in some areas suggest the pattern could be changing. As the amount of developed land has increased and more and larger homes have been built, buildings, roads, and associated impervious surfaces have grown to serve an increasingly dispersed population. As our communities changed to accommodate cars, the percentages of people taking public transit, walking, and biking declined. Projected population growth and demographic trends suggest that the need for additional development will continue to increase.



As the U.S. population has grown, we have developed on land that serves important ecological functions at a significant cost to the environment. Development has destroyed, degraded, and fragmented habitat. Water quality has declined. Air quality in many areas of the country is still adversely affecting human health. The heat island effect and global climate change illustrate just how complex and far-reaching the impacts of our built environment are. Poor community design can make it difficult for people to get adequate physical activity, engage with neighbors, and participate in community events.

Urban sprawl is a fact of life for most Texas cities. Wide open spaces are quickly disappearing to development, most of it for residential housing. The American Farmland Trust reported in 2002 that the United States was losing two acres of prime farmland every minute to development. The same report estimated a loss of 6 million acres of farmland between 1992 and 1997 due to sprawl. In Texas, the loss during that period was approximately 332,800 acres of quality farmland – a 42 percent increase in rate of loss over the previous five years and more than any other state during that period. Most of those losses occurred in the Texas Blackland Prairie around Austin, Waco, the Dallas-Fort Worth metroplex, and in the Lower Rio Grande Plain.



Looking at how development sprawl has transformed the City of San Antonio, 1991 to 2010.

Development on the urban fringe is the conventional response to population growth and the migration from country to cities that has been underway for the past century. Unfortunately, it destroys habitat for wildlife, threatens water quality, strains water resources and, too often, does not produce the quality of life that homeowners expect. Changing where and how we build our communities can help mitigate these impacts, improving how development affects the environment and human health.

- Where we build involves locating development in a region or land area. It includes safeguarding sensitive areas such as riparian buffers, wetlands, and critical habitat from development pressures; directing new development to infill, brownfield, and greyfield sites to take advantage of existing infrastructure and preserve green space; and putting homes, workplaces, and services close to each other in convenient, accessible locations.

- How we build includes developing more compactly to preserve open spaces and water quality; mixing uses to reduce travel distances; designing communities and streets to promote walking and biking; and improving building design, construction, and materials selection to use natural resources more efficiently and improve buildings' environmental performance.

According to the Environmental Protection Agency's (EPA) 2013 **Our Built and Natural Environments: A Technical Review of the Interactions Among Land Use, Transportation, and Environmental Quality** report, these elements are interrelated and often work most effectively in combination with each other rather than individually. Although findings might differ on the magnitude of the effects of different practices, the evidence is overwhelming that some types of development yield better environmental results than others. Used in combination, these practices can significantly reduce impacts on habitat, ecosystems, and watersheds and can reduce vehicle travel and energy use, which in turn reduces emissions that cause local, regional, and global air quality concerns. As communities nationwide look for ways to reduce the environmental and human health impacts of their development decisions, the evidence is clear that our nation can continue to grow and can build a strong foundation for lasting prosperity while also protecting our environment and health.

What are some environmental benefits of smart growth strategies? Development guided by smart growth principles can minimize air and water pollution, reduce greenhouse gas emissions, encourage cleanup and reuse of contaminated properties, and preserve natural lands. Where and how we develop directly affects natural areas and wildlife habitat and replaces natural cover with impervious surfaces such as concrete or asphalt. Development patterns and practices also indirectly affect environmental quality since they influence how easily people can get around.

Smart growth practices can lessen the environmental impacts of development with techniques that include encouraging compact development, reducing impervious surfaces, safeguarding environmentally sensitive areas, mixing land

uses (e.g., homes, offices, and shops), promoting public transit, and improving pedestrian and multimodal amenities.

Patterns of development, transportation infrastructure, and building location and design – the built environment – directly affect the natural environment. Development takes the place of natural ecosystems and fragments of habitat. It also influences decisions people make about how to get around and determines how much people must travel to meet daily needs. These mobility and travel decisions have indirect effects on human health and the natural environment by affecting air and water pollution levels, the global climate, and levels of physical activity and community engagement.

According to the American Planning Association's (APA) **Smart Codes: Model Land-Development Regulations** 2009 report, open space, conservation, and cluster subdivision practices are among the more effective ways of setting aside green space and open space. Local regulations are not "smart" unless they provide for, and even encourage, these types of subdivisions. When clustering or conservation design is not allowed, developers wind up incorporating all land into the individual lots, which are then sold, and the opportunity to preserve natural features and open space is then lost, probably forever.

Conservation development offers a wonderful opportunity to celebrate the land's regional character. Whether hill country, prairie or coastal plain, this approach to land development is appropriate because it preserves the unique local flora and fauna. Conservation development is a way to show that humans can work with the rest of nature to achieve their own goals without compromising a healthy ecology. Conservation development balances the demands of a growing population with the need to conserve natural resources. In addition, the adjacent open space increases the value of the homes and the tax revenue from the property. The heritage of rural Texas and its unique regional identity is preserved along with critical water resources and habitat.

The Northern Illinois Planning Commission's Conservation Design Resource Manual, referenced in the APA's **Smart Codes: Model Land-Development Regulation** 2009 report, recommends adhering to:

The four major principles of conservation development design:

1. Develop flexible lot size and design standards;
2. Protect and create natural landscape drainage systems;
3. Reduce impervious surface area; and,
4. Implement sustainable stormwater management techniques.

A great example of conservation development is what they're doing in Pike County, Pennsylvania. Highlighted in the **Smart Growth: Strategies for Creating Viable, Environmentally Sustainable Communities** report: Pike County owes its economic and social well-being to the scenic beauty and natural resources that attract people and businesses and provide quality of life to residents and visitors: clean and abundant water resources, clean air, intact forests, abundant wildlife, scenic vistas, readily accessible public recreational lands and natural areas. In the next decade and beyond, Pike and other counties in the Northeast region will absorb thousands of new residents. Efforts to accommodate this growth, while protecting the County's natural resources, could be greatly enhanced by proactively planning and implementing sustainable, community-oriented patterns of growth and development.

Development pressures will continue to present significant challenges to maintaining the quality of life, including the abundant natural resources that make Pike County a desirable place to live and a sought after destination for visitors. Unplanned or poorly planned communities that encourage sprawling development patterns could experience considerable long-term consequences including environmental degradation, dwindling open space, fragmented or stagnant economic development and a loss of community character.

Smart growth strategies provide an antidote to the negative impacts of sprawl. Comprehensive planning, land use regulations that link development with sustainable use of natural resources, protection of open space, innovative stormwater management strategies, enlisting the participation of residents in community planning, and multi-municipal cooperative efforts are all part of the tool kit of options that smart growth strategies provide.

Some action steps for implementing Smart Growth strategies:

- Support community association and municipal efforts to **conserve open space** through land acquisition and conservation easements.
- Support municipal initiatives to **manage stormwater** on a regional or watershed basis through cooperative efforts between neighboring municipalities.
- Get involved in the **community planning process**. Attend monthly public municipal meetings or volunteer to serve on a municipal planning board.
- Voice support for municipal efforts to **adopt land use regulations** that support conservation design and low impact development strategies.
- Let local officials know you support the creation and **implementation of comprehensive plans** that provide a blueprint for community development.

NATIONAL MODELS AND CASE STUDIES

There are a number of wildly successful and efficient conservation subdivisions around the country. Randall Arendt, a decorated conservation planner and author, and one of the key members of the project team, worked closely with local communities and developers to make each of the below-mentioned projects a reality. As seen in the provided case studies, opportunities for creating useful, value-adding conservation land exist at a wide range of densities and tract sizes, and across differing communities. Some conservation developments are more dense than others, some conserve agricultural land while others conserve large bodies of water. But they all have one commonality: a large, permanently protected natural area that is free and open to the public, and assists the surrounding natural environment by providing restored ecologically-sensitive areas, essential habitat for wildlife, and permanent protection from encroaching development and from ultimately being developed.

To achieve these conservation goals, each conservation subdivision mentioned below followed a similar design process. First, the most significant parts of the property were identified for potential conservation. Much the same way that a golf course subdivision is developed – developers begin by demarcating the course's 18 holes, followed by the location of home sites and streets around the course. This careful, conservation land-minded design approach allows developers to avoid, or at the very least, minimize detrimental fragmentation of the open space. Typically, developers select the locations of home sites and streets prior to locating open space, but that approach does not take into consideration the overall health of ecologically-sensitive areas.

Open space conservation should serve four related purposes: (1) it should be visually appealing, (2) it should attract residents to use it regularly, making it a place of social connections, (3) the landscape plantings should be largely edible, and (4) nearly all stormwater should be retained and filtered on-site prior to reaching the local aquifer.

Read on to learn more about the unique characteristics of some of the most successful conservation subdivision models across the country. For full descriptions of the case studies, please refer to the Appendix at the end of this report.

Chimney Rock, Texas

The first conservation subdivision of its kind in the state of Texas, Flower Mound developed and manages an open space conservation plan that outlines the types of standards and maintenance practices best for long-term preservation of the rural character of the community. By "single-loading" a third of the principal streets – meaning, keeping house lots on only one side of the street – and by slimming down the sizes of the community's house lots, the development's construction costs were on par with the costs of a typical subdivision, and the developers were able to profit off of the conservation incentives offered to them by the town of Flower Mound. The planned community includes the restored and permanently protected pond area, surrounding woodlands, a long meadow that traverses through the property, and the public viewshed containing several scenic vistas.

Montgomery Farm, Texas

This particular subdivision was unique in that the developer wanted to blend three elements into the land: 1,200 Single-Family residential units, a working tree farm, and a New Urbanist mixed-use center designed around a central greenway. The central greenway laid the groundwork for an upcoming trail extension project that would see the creation of six city trails that will extend through Montgomery Farm, connecting Frisco in the northwest with Dallas to the south.

Village Homes, California

As one of the pioneers of the conservation development concept, this subdivision has led the way in celebrating neighborhood greens, community commons, playing fields, greenway corridors, and allotment gardens – complete with orchards and a small vineyard, which provides approximately 75 percent of the local community's produce. Village Homes provides an exemplary lesson on how developers and local government can work together to achieve multiple conservation goals through innovative design.

Poplar Gardens, Colorado

Architecturally designed to resemble a bungalow court, this community's residential units all front a central green, and contain front porches which help promote a sense of community. Originally designated as an affordable housing development, each homeowner contributed their own "sweat equity," meaning homeowners assisted with several labor-intensive tasks during the later stages of construction. As a continuation of this program, the homes will remain permanently affordable due to resale restrictions limiting appreciation to only 3% per year. This one-of-a-kind subdivision provides a great example of a conservation development that is and will remain affordable, since many of these types of developments tend to contain upper-end housing options.

Twin Buttes, Colorado

The successes surrounding this community come from the promotion of sustainable design involving both private sector initiatives and public sector support. By agreeing to identify areas "subject to specific policies affecting the timing, type, density, and location of authorized land uses," a variety of landscapes and ecosystems were able to undergo an extensive site analysis prior to development planning. Stakeholders involved in this process were able to blend the principles of conservation design and elements of New Urbanism in a Smart Growth hybrid manner, limiting the development footprint to a minimum.

Long Hill Farm, Connecticut

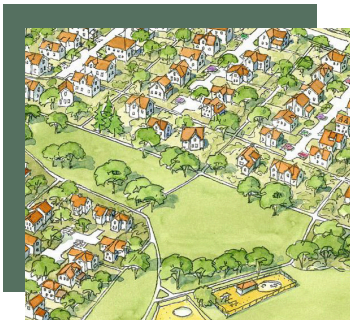
By taking advantage of optimal locations on the property's uneven forest topography, this subdivision was able to minimize site disturbance to the surrounding natural environment by preserving existing native trees and constructing winding roads. Architecturally, the development's barn-like structures were "designed to harmonize with older neighborhoods and the rural countryside," while still being utilized as storage space for residences. Management of wastewater disposal was also able to be blended into the vernacular building patterns as the septic systems were placed on the best soils adjacent to the meadowlands.

Strathmore Farms, Connecticut
The developer of this community went against the grain and decided to preserve the rural character of the area by not subdividing the 29-acre parcel of land into the typical checkerboard pattern. As a result, the local country roads and existing horse pastures were able to coexist with the 24 Single-Family homes that were constructed nearby.

Park at Wolf Branch Oaks, Florida
This small community had two complementary approaches to land-use planning: New Urbanism for areas in and adjacent to the surrounding towns, and Conservation Subdivision Design (CSD) for properties in outlying areas zoned for suburban development. A central park, planned around a dozen large oak trees, is the preferred spot for residents to enjoy and socialize.

East Lake Commons, Georgia
The property's residential area is a blend of market-rate and subsidized housing, designed to accommodate accessory dwelling units. The community – made up of 67 homeowners who jointly live on four acres – is driven by the Community-Supported Agriculture program (CSA), and assists with local farmer's markets and homeless shelter food donations.

The Fields of St. Croix, Minnesota
Prior to the development of this property, local stakeholders felt it was time to update the development standards associated with conservation design. By establishing new standards and working with the local government, developers were able to increase the overall residential density through provided bonuses by implementing various community amenities and conservation-oriented design features, while also respecting the public viewshed. Innovative and high-tech management practices were applied to the property's wetlands to restore them to their original glory, and aid in ongoing filtration, specifically aiding in the removal of excess nitrogen and phosphorus.



Radburn, New Jersey

Known as the “subdivision within a park,” the Radburn community is organized around a system of interconnected public parks. Compactly built for pedestrians, Radburn created underpasses beneath several roadways in order to provide unobstructed community walkability and connectivity. As a result of these communal services, Radburn has been able to boast a large number of second generation residents, individuals who grew up there and moved back as adults so that their children could enjoy the same pleasures and benefits.

Ringfield, Pennsylvania

Conservation design throughout Ringfield is focused on the preservation of local woodlands and the trails that have been linked to the various neighborhoods nearby. This form of preservation has also been extended out into a monitor and maintenance program for invasive species within the last decade.

Spring View Farms, Utah

A prime example of greenway networking, Spring View Farms has prided itself on the conservation of its river corridor, wetlands, and other environmentally sensitive features within its community. In order to expand on the territory it was willing to protect, Spring View Farms clustered their provisions by supplementing with bond money and private funds in order to add to what the local ordinance was already inclined to preserve.

CHAPTER 3

TESTING APPROACH AND INCENTIVES FOR HAYS COUNTY

ROBUST STAKEHOLDER AND PUBLIC INVOLVEMENT

A PLAN DRIVEN BY COMMUNITY ENGAGEMENT

Public involvement for a project like this is most effective if presented on several channels, both a broad spectrum and in more focused, targeted ways, since most members of the general public are unlikely to be familiar with the nuances of development standards. With this in mind, the project team built a public website, conducted a virtual town hall, reached out to the community through media of general circulation, and sponsored a public forum; but, also, directly engaged stakeholders such as developers, city and county officials, landowners, environmental organizations, builders, and others who interact directly with the land development process. The feedback and opinions from these public forums and stakeholder exercises helped drive the final product.

Public engagement was performed based on equitable outreach techniques. This outreach was designed to be mobile-friendly, interactive, easy to use, accessible to people with disabilities, and multilingual.

GATHERING INPUT & INSIGHT

100+
STAKEHOLDER SURVEY RESPONDENTS

724
VIRTUAL TOWN HALL ATTENDEES

1,400+
WEBSITE AND EXHIBIT PAGE VIEWS

ADAPTED TO COVID-19

With the onset of the novel coronavirus pandemic (COVID-19) in the midst of the project, social media and online engagement tools offered an opportunity to expand and diversify participation in the public involvement process, bringing more people to the (metaphorical) table. These tools provided new opportunities for the County and project team to collect and share information with the community, expanded the reach of traditional engagement activities, and produced additional data to support essential planning activities and services that keep infrastructure moving. Moreover, online tools and social media platforms removed the time constraints of in-person meetings, offered opportunities for citizens to participate in new and interactive ways, and brought new voices into the engagement process.

Project Website

The project team designed a stand-alone website that was linked to the County's website. The website was regularly updated throughout the project. Final content was approved by County officials:

- Prominent notices and updates about the upcoming presentations, public meetings, workshops, and more;
- A calendar or other graphic showing the path and timeline to adoption;
- GIS maps provided by the project team;
- Explanations of the science behind the maps, and how they are important and relevant to the project;
- Direct links to the existing conservation development regulations, such as Chapter 765 of the Hays County Development Standards, and the Travis County Conservation Development Design Manual;
- Explanations of common conservation development terms such as cluster development, low-impact development, and more;
- Contact lists for the project team and County Staff; and
- Links to the virtual town hall, public workshops and the charette reports.

Stakeholder Outreach and Survey

Stakeholder outreach and public involvement are critical to the success of any project, particularly large and complicated projects such as this one. Therefore, the project team took into consideration a wide range of local, regional, and federal stakeholders. To efficiently reach out to each identified stakeholder, the extensive stakeholder list was broken into two separate tiers:

- Tier One consisted of entities, organizations, and individuals with applicable technical expertise and special interest in the County's conservation development efforts and guidelines. Local and regional conservation organizations that have a prominent presence in Hays County, several local watershed associations, Hays County area builders, several individuals representing the Hays County Parks and Open Space Advisory Committee, the Hays County Appraisal District, and the Greater Austin Area Realtors were just some of the entities included in tier one.

- Tier Two included a broader array of entities, organizations, and individuals who also have regulatory authority as well as outspoken vested interest in the County's conservation development efforts and guidelines, such as local and regional governments, a number of local landowners, nature preserves and conserved properties, several university departments in the area, and other regional conservation organizations.

With the goal of guaging stakeholder opinions on augmented conservation subdivision guidelines, the Hays County Conservation Stakeholder Survey was sent to more than 100 individuals in November of 2020. The survey consisted of six multiple choice questions and one open-ended question. The list of local stakeholders included developers, realtors, city and county officials, landowners, land use attorneys, builders, environmental advocacy groups, and other land development related professionals. Stakeholders were contacted via email and by phone and were encouraged to participate in the survey. One hundred and six responses were received and analyzed by the project team.

Randall Arendt Workshop

The project team conducted a virtual conservation development workshop, led by conservation planner and author Randall Arendt, to walk the community through the typical conservation development design and entitlement process. The workshop was co-sponsored by the Texas State University Geography Department, and was an ACEA (Austin Contractors & Engineers Association) collaborative event. Arendt's presentation was followed by an in-depth Q&A in which Jeff Barton, Project Manager, Randall Arendt, and Hays County Commissioners Lon Shell and Walt Smith led the discussion and answered questions submitted by various stakeholders and community leaders.

Virtual Town Hall

A virtual town hall was hosted on the project website from February 5th to February 19th, 2021. The goals of the data heavy virtual town hall were to:

- Provide background information and data on the project;
- Report on team findings from the stakeholder survey and the design charrette workshop;
- Provide participants with a concise timeline and important dates, including when the project was planned to be completed and presented to the Hays County Commissioners Court;
- Provide context, explanations, and definitions of various project aspects, focuses, and goals;
- Present proposed criteria, requirements, incentives, and draft language augmenting the County's existing Conservation Development regulations; and
- Collect feedback and opinions on different aspects of the project from participants.

The entire town hall process was made available in English and Spanish, as well as tailored to those who require assistive technologies (deaf or those with visual and mobility impairments). The landing page for the town hall asked those participating to "sign in" to allow the project team to capture the same basic demographic data that would be gathered at a live event.

The virtual town hall walked through a variety of project elements:

- An introductory video featuring Randall Arendt, as well as drone footage of the Charette site visits;
- A robust slide presentation saturated with exhibits and images to help explain the purpose of the virtual town hall, the background of conservation development concepts and design approaches, and walked through the history of the project, timeline, and progress;
- A brief analysis of stakeholder and community feedback;
- A data heavy section explaining and showcasing the design charrette process and results;
- Review of the draft augmented guidelines, menu of options matrix, and economic incentives; as well as
- An online form for comments, questions, and concerns.

Virtual Town Hall Results

- 724 unique visitors
- Over 1,400 page views
- 47 comments – all positive
- Users spent up to 25 minutes looking at exhibits

CONCLUSION

Prolonged, multi-faceted engagement and close collaboration with stakeholders and the broader Hays County community has made it apparent that there is strong interest in conservation design and development in Hays County. Positive responses to the virtual town hall and the stakeholder-only survey indicate that developers, landowners, conservationists, public officials, land development related professionals, and regular residents across the County are interested in conservation development, with many expressing strong support for the type of augmented regulations recommended in this report.

When asked what are the obstacles to conservation development, 70 percent of respondents chose either "it's too expensive to build this way" or "too many regulatory hurdles." Updated guidelines would go a long way in addressing these concerns.

DESIGN AND FEASIBILITY

CHARRETTE

The project team was tasked with accomplishing something unprecedented in Texas: create a conservation development ordinance that results in positive conservation outcomes that operates within the constraints of limited Texas local government regulatory authority, and is calibrated to be useful for the development community. The concerted effort was made all the more possible by the strong and robust community engagement foundation that ensured wide-reaching community support for the final ordinance and augmented guidelines.

The convoluted project experience shows that one of the most essential elements of a successful development ordinance is one that has been thoroughly tested. Guidelines and standards cannot only be efficient and successful in a vacuum, they must be tested and applied to real world conditions, capable of achieving desired conservation outcomes. This is what the project team set out to accomplish with the multiday design charrette.

In many cases, the charrette results can be used to calibrate a draft code or similar element. In this case, the elements of a conservation ordinance in Texas counties, being voluntary, are based on a series of incentives, rather than required standards. Therefore, the project team worked to provide inputs on the front end that would then be used to calibrate those incentives. These inputs started first as a comprehensive list of development and environmental goals, which were later translated into criteria that could be evaluated as part of the charrette design process.

It is important that the incentive structure be in alignment with what the market could bear and what the land could bear. Hays County contains two distant ecological areas – the Hill County and the Blackland Prairie – each with associated development criteria and patterns. To thoroughly test the draft rules in different market and environmental conditions, the draft guidelines were tested in each of the two ecologically distinct areas of the County.

Given the COVID-19 constraints, the project team was forced to do a virtual charette. Although participating virtually provided some constraints due to the lack of easy collaboration, the design charrette functioned effectively and efficiently by following a strict schedule that allowed for designated time slots for discussion, design, and review. Several members of the design team were able to work in-person, which facilitated the iterative design process.

A CHARRETTE TEAM ROBUST IN BOTH BREADTH AND DEPTH OF TALENT AND EXPERIENCE

Facilitators
Gap Strategies – Jeff Barton, Kara Bishop Buffington, Sarah Boza, and Andres Gonzales

Planning and Design Professionals
TBG Partners – Rob Parsons, Sean Compton, Adrienne Kartachak, and Tom Afflerbach
Siglo Group – Jonathan Ogren, Haley Wagoner, Michael Eason, and Laura Brusson

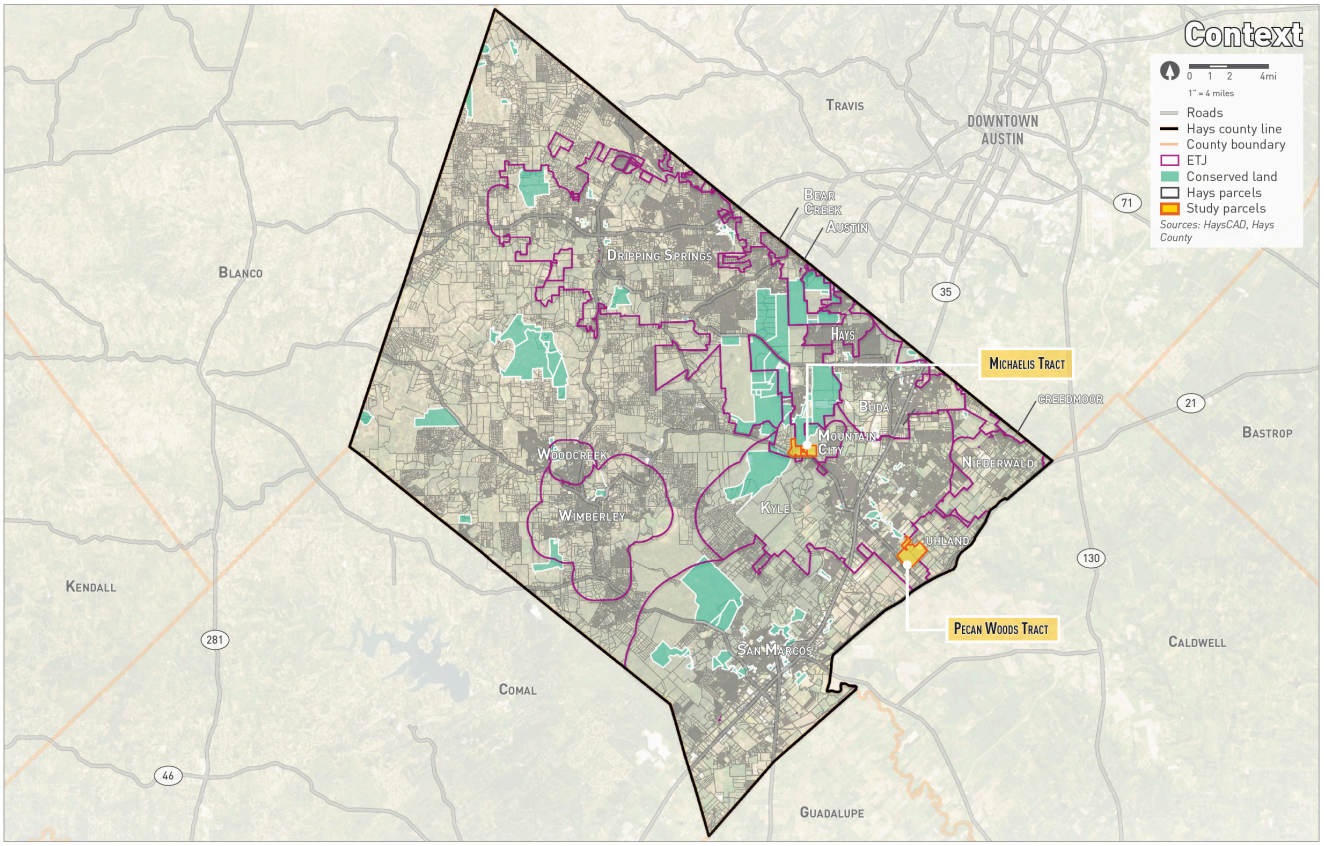
Engineering
Doucet & Associates – Tom Hegemier, Tracy Bratton, Jen Paisley, Jacob Harris, and Jake Helmburg

Environmental Regulation & Conservation
SWCA – Amanda Aurora and Stephen Van Kampen-Lewis

Financing and Incentive Building
DPFG – Rick Rosenberg

Project team members were split into two design teams, one for each site. Several members participated with both teams as an expert resource.

The charrette occurred over the course of three days beginning with a visit and walkthrough of both properties prior to the design days. Monday, January 11th, 2021 was designated as the charrette kick-off and site discovery day, which began with team member introductions followed by a presentation on goals and objectives, overall project orientation, and detailed walkthroughs led by the landowner or property manager. Next, each design team began the site discovery phase and developed initial site concepts. The site discovery phase consisted of reviewing each site context, the unique "real world" challenges each offer, identifying on- and off-site opportunities and constraints, and reviewing the regulatory criteria each site should consider.

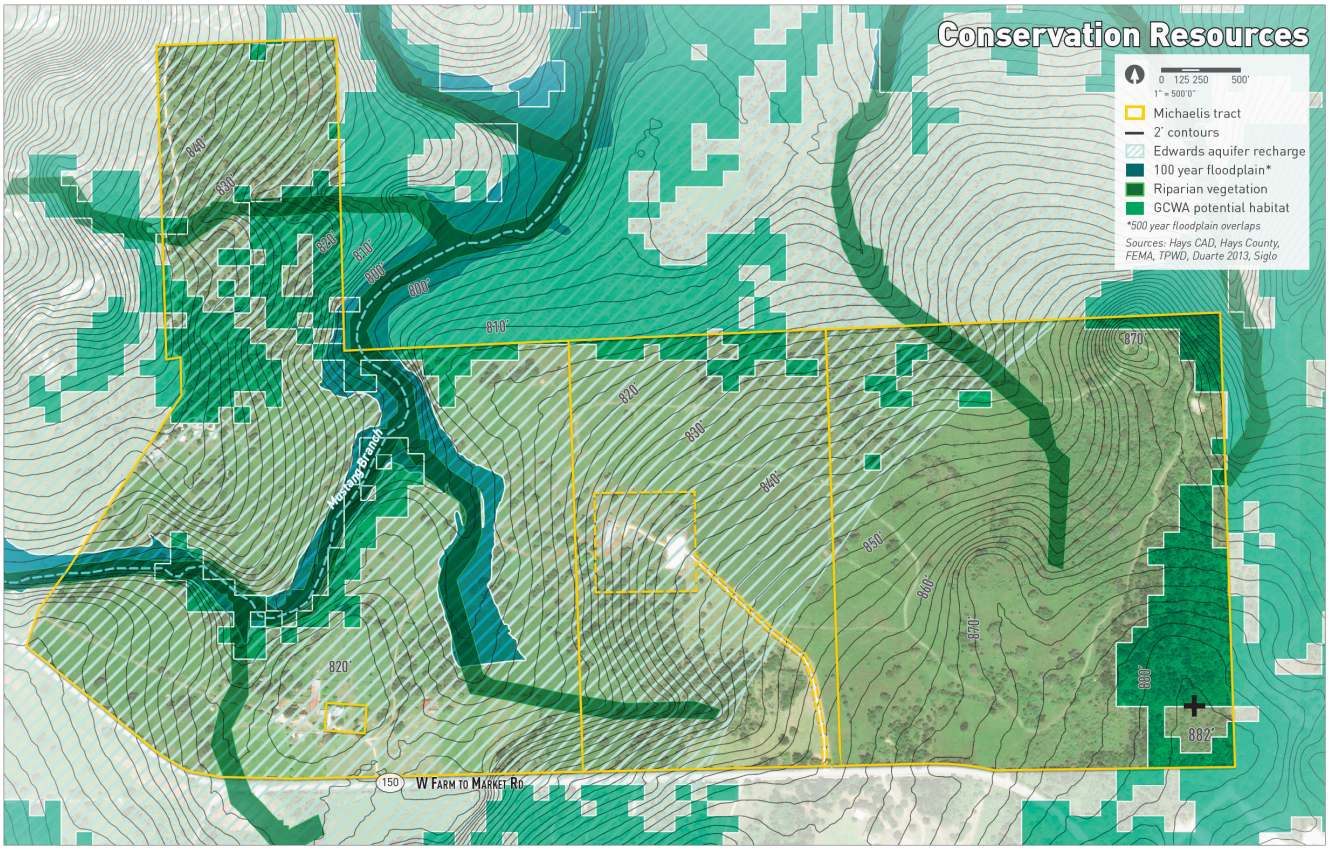


Two Hays County landowners were generous enough to allow the project team to use their properties in the "real world" test of the draft guidelines.

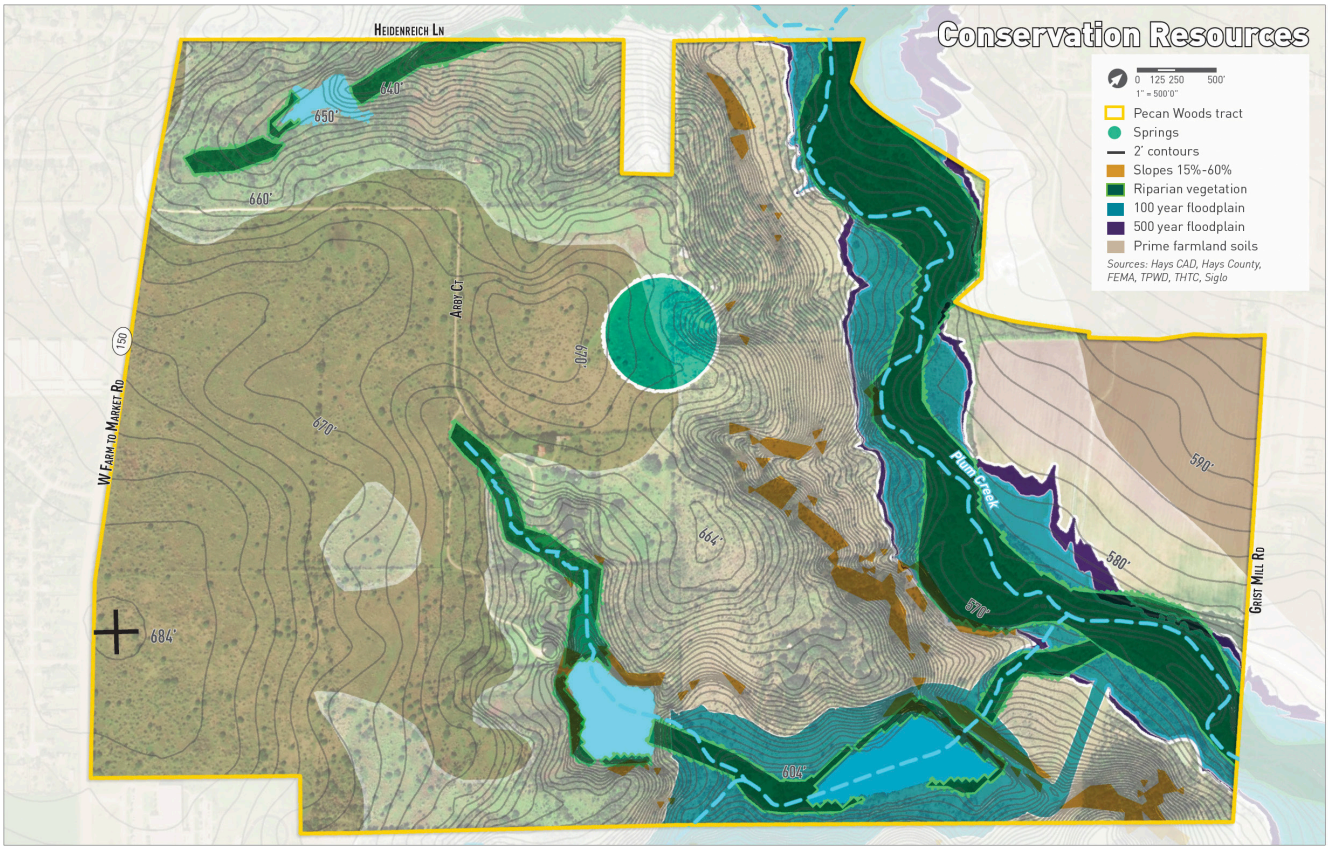
The Michaelis tract in western Hays County is home to scenic vistas in the wooded Central Texas Hill Country. The property lies within the Edwards Aquifer Recharge Zone and contains karst topography, Golden-cheeked warbler habitat, as well as a fair amount of floodplain and riparian vegetation due to Mustang Branch and a couple of on-site tributaries. Much like other properties in the Hill Country, the Michaelis tract does not have public sewer access, therefore on-site advanced septic systems must be used. The site does however have public water access.

The Pecan Woods tract, on the other hand, lies in eastern Hays County, within the Blackland prairie, and contains a significant amount of prime farmland soils that have been critical to the on-site agricultural activities. The surprisingly hilly property contains pockets of highly steep slopes, a natural spring, and a significant floodplain due to Plum Creek meandering through the property. All of these on-site ecologically-sensitive elements didn't leave much room for development under the terms of the charrette, forcing the design team to make several conservation compromises. Due to the property's close proximity to the more urbanized and developed area of the County, the site has public water and sewer access.

MICHAELIS TRACT

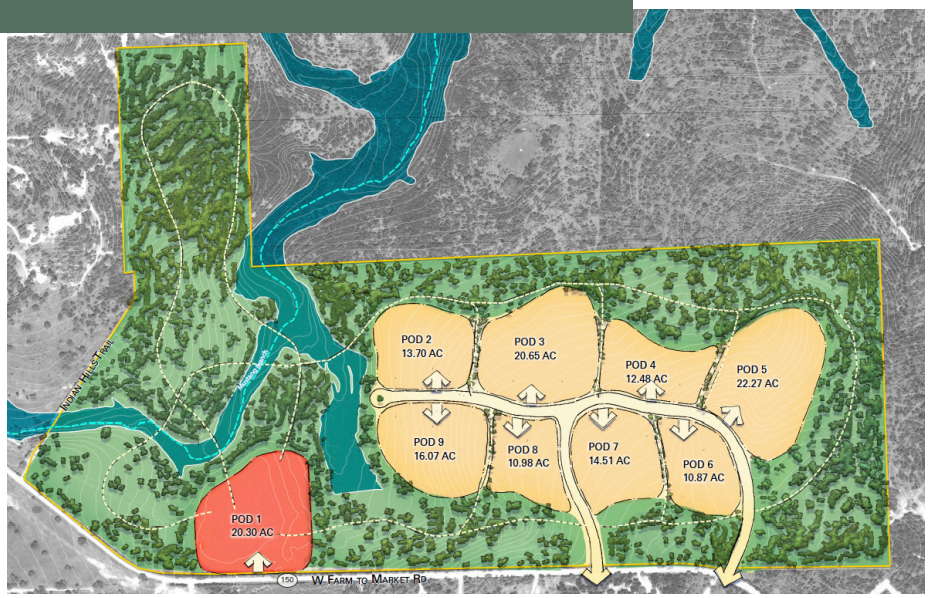


PECAN WOODS TRACT

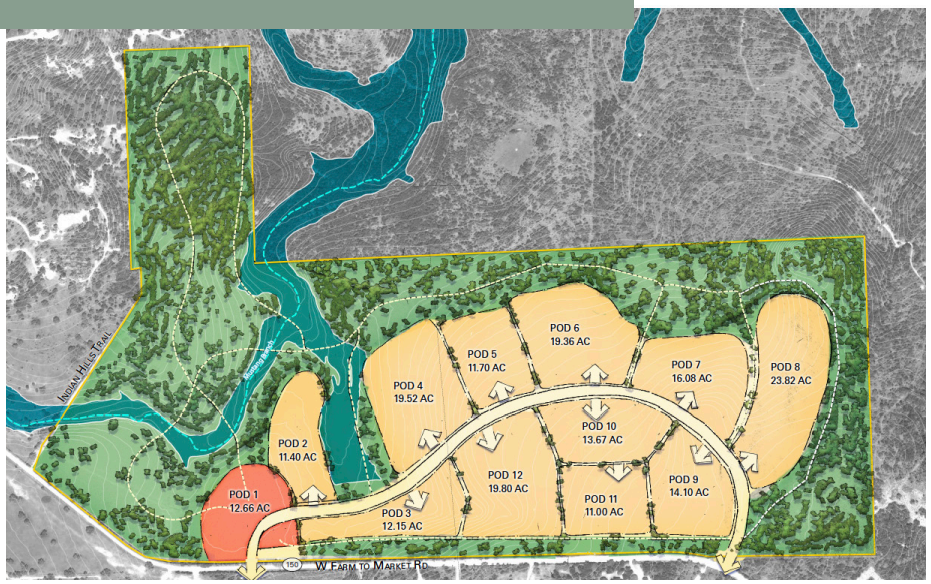


MICHAELIS TRACT

DARK GREEN CONCEPT



LIGHT GREEN CONCEPT

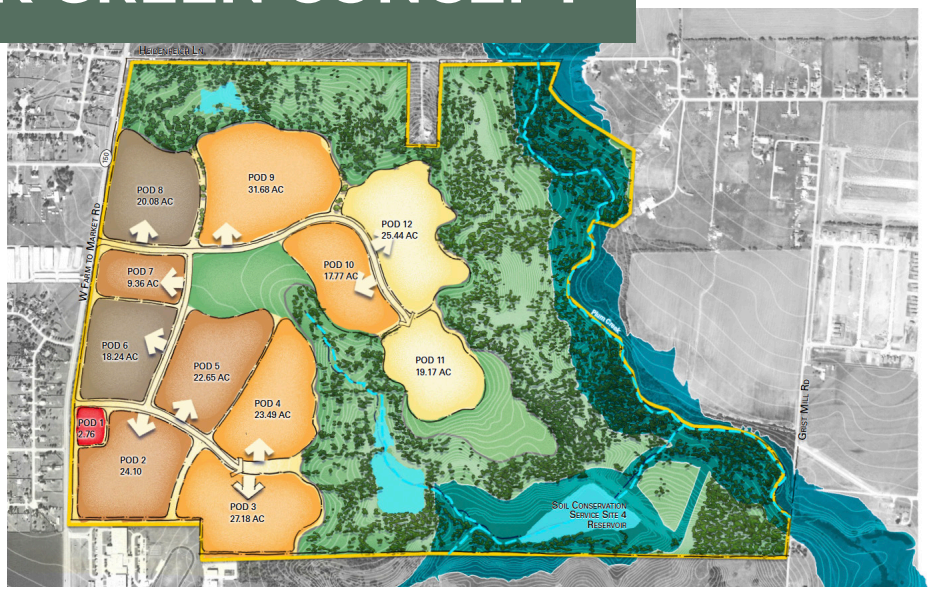


- Commercial
- Rural Residential
- Urban Multifamily
- High-density Residential
- Medium-density Residential
- Low-density Residential

The approach to design was driven by looking at two concepts to demonstrate a range and criteria. A “Dark Green'' and “Light Green” Concept, indicating a high level and lower level of conservation goals, respectively. The attempt was to show how a similar number (or greater) number of units could be delivered with the light green concept while still increasing the positive environmental outcomes relative to the dark green concept. The tradeoff in these concepts was to assume a greater density to offset the greater conserved area.

PECAN WOODS TRACT

DARK GREEN CONCEPT



LIGHT GREEN CONCEPT

OBESERVATIONS

No Easy Answers
It may not come as any surprise to those that have a history in planning and development, especially in areas with high levels of development pressures, but it was obvious throughout this process that there was no easy answer to achieve the stated goals while also producing a plan that was viable and realistic.

Shared Septic Limitations
One surprising takeaway was the limited value of using a common septic system using a horizontal condo regime due to septic costs and land constraints relative to conservation value. Initially this was a promising possibility and does have applicability in some cases, but common septic was not able to be incorporated in the Eastern site, Pecan Woods, as a way to justify a savings in infrastructure costs while still maintaining a certain threshold of density and units on a larger scale.

General Applicability
Due to development pressures and rising land costs on the demand side, and limited tools available on the regulatory side, there is a narrow window in which the conservation ordinance can make sense. Key to this will be well calibrated incentives, paired with both landowner and developer interest, and education from the county to developers. This education should include general benefits of land conservation, private tools like deed restrictions placed prior to land sale, and the utilization of a wide range of innovative financing tools.

County Participation in Innovative Financing
To efficiently incentivize developers and landowners, the County must develop new and expand on exsiting financing tools. Economic incentives in the form

of public backing can be instrumental to development projects. County-provided public backing on horizontal development activities – which are typically hard and expensive to finance – in exchange for meeting a certain threshold of conservation goals can significantly alleviate a developer or landowner's capital constraints related to the development and subdivision of a property. In addition, the streamlining of public-private partnership practices – such as through PIDs, MUDs, and TIRZs – would also lower the cost of capital and could provide a plethora of benefits.

Floodplain Allocation

An issue that was repeatedly discussed and tested was the amount of open space that could be floodplain to count towards a required open space dedication. It was evident that if the percentage were too low it made open space targets too hard to achieve and therefore would make the ordinance unusable. This seems to be an issue in both sites (and the ecological areas they represent), but especially in the Blackland Prairie where the flood plains tend to be more prevalent and larger, relative to total site areas, generally speaking). One idea was to require a certain level of improvement or restoration to floodplain areas in exchange for counting a larger percentage of them towards open space. Another was to have a sliding scale relative to the overall site size or percentage of the site that was flood plain. This will require careful calibration in the proposed ordinance.

IN SUMMARY

The charrette process tested a range of development types on real sites in the two distinct environmental locations of Hays County. This allowed the team to calibrate elements of the code from a regulatory and incentive-based approach. The final stage in the process is to write a code that is both flexible in its options but predictable in reaching a threshold of conservation outcomes.

CHAPTER 4

FINDINGS

THERE IS WIDE, POSITIVE
PUBLIC SUPPORT

Gauging public support for expanded Conservation Development standards was, as mentioned previously, a priority for the team. Based on the overall number of positive responses and comments, developers, landowners, elected officials, and the general public are ready and excited to explore conservation design ideas and initiatives in Hays County.

Several response submissions from the stakeholder survey show a range of positive comments:

> "This is an important tool to be able to incentivize conservation, particularly in sensitive areas. A development master plan that considers land, water, and transportation holistically is likely a good natural next step in the planning process."

> "All my 'yes' answers mean "Heck yes!" Hays and very few other counties in Texas have been crawling toward a 21st century development regulatory environment slowly but surely. This is the best chance we've had to get it done in Hays. Thanks!"

> "I am hopeful Hays County will become a regional leader in sustainable development. Kudos for your efforts!"

- Stakeholders and community members

Stakeholders who participated in the community survey pointed out that they are hopeful that this type of design will encourage a balance between protecting and enhancing the County's conservation values with the need to accommodate the region's unprecedented growth through sprawling development. The case between traditional development and conservation development is not an "either/or" situation, however, but rather a "both/and" situation. Conservation development not only has the opportunity to provide necessary environmental and community benefits, it also generates higher rates of return for developers and landowners who would be offering more attractive housing products and communities than their typical developer counterparts. As one community member stated in their survey response: "Hays County is pushing up to a hard decision point: will it grow, prosper, and act as an example for thoughtful, balanced planning, or simply default to a faceless, disconnected series of suburban developments and suffer the costly consequences of an irremediably broken ecosystem?"

In talks with local and regional developers, it became clear that achievable and reasonable financial incentives could help motivate and encourage developers and landowners to take a second look at the County's conservation development standards, and opt for more environmentally friendly construction and development approaches. Regional non-profit conservation organizations emphasized the urgency of adopting more incentivized and reasonable standards.

The preservation of Hays County was clearly voiced throughout the public engagement campaign. It was made clear that conservation development is desired by the general public, and vitally necessary to preserve the character of all Hays County communities. Protecting and conserving the County's natural resources and most celebrated areas is integral to preserving the overall sense of place and community the County has achieved and is known for.

CONSERVATION DESIGN:

THIS IS WORKABLE FOR HAYS COUNTY

Conservation subdivision development is feasible in Hays County, both east and west of Interstate 35. Not only is there overall public support for projects such as these, but there is a strong willingness from local jurisdictions throughout the County to encourage, and even incentivize, developers to build in a conservation-oriented manner. Residents of Hays County – across professions and generations – are proud and protective of the scenic landscape that makes Hays County special. Regardless of politics and ideologies, it is clearly evident that substantial growth and development is here, and it's not going away anytime soon. There needs to be easy-to-follow standards, and incentives, in place to encourage and promote green and conservation-oriented development.

The beauty of conservation design – as we've seen through the various case studies from around the nation, studies and statistics from reputable sources, and even the project team's design charrette testing feasibility on two different County parcels – is that it can be successful in any location. This green design approach continues to meet conservation goals, and has delivered a high return on investment, from coastal areas to mountainous regions, rural zones, more urbanized cities, in states that lean politically liberal or conservative, and across regions around the world. Conservation development is a viable alternative to conventional development.

Conservation development allows for greater flexibility and creativity within the development design, while also preserving the fundamentals of conservation. It encourages a more efficient form of development that consumes less open land and conforms to existing topography and natural features; thereby allowing the program to become more marketable across all of Hays County.

SIGNIFICANT POTENTIAL FOR
COST SAVINGS

Conservation Development is considered a “win-win,” that is, the benefits provided extend beyond just the preservation and protection of nature areas. One of the main goals of this report is to provide clear guidelines and demonstrate to developers and landowners that these green design approaches are viable, and ensure cost savings and a greater return on investment. The financial incentives that Hays County could feasibly offer eligible developments could even further help fund and make some exceptional projects a reality. Three cost savings benefits inherent to true conservation development projects include:

Conservation developments are less expensive to build.
By reducing the overall size of a tract’s developable area, and building denser on a smaller footprint of land, impervious cover and infrastructure construction costs are significantly lowered.

Long-term return on investment.
Conservation-oriented developments have a net positive impact on property values; homebuyers are attracted to the scenic beauty, the proximity to natural areas, and the spirit of conservation and preservation. People like the idea of contributing to conservation efforts, and are drawn by the aesthetic of sustainable, green developments. Regardless of the reasons, developers can expect property values to be higher than similar sized properties in conventional developments, and for values to increase each year, particularly as conservation developments become more widely accepted, implemented, and standardized.

Reduced stormwater management costs.
A streamlined stormwater management system can reduce or eliminate the need to build costly infrastructure, such as detention ponds or retention basins. Innovative stormwater management systems have the ability to collect and ultimately reclaim rainwater for non-potable purposes across the development, significantly reducing water utility costs and strain on the local potable water supply.

MICHAELIS TRACT

	CONVENTIONAL SUBDIVISION	CONTEXT-SENSITIVE SUBDIVISION	CONSERVATION SUBDIVISION 1	CONSERVATION SUBDIVISION 2
TOTAL LOT YIELD	182*	276	194	87
CONSERVATION LAND**	5%	53%	62%	65%
TOTAL INFRASTRUCTURE CONSTRUCTION COST	$13M	$17M	$15M	$8M
INFRASTRUCTURE COST PER LOT	$63,500	$55,800	$67,500	$95,300

* If a sustainable, public water supply had not been available on the Michaelis tract, lot yield would have been reduced significantly.
** The percentage of gross property that is dedicated to conservation land does not include any land located within a flood plain.

As part of the design charrette, the multidisciplinary professional team created multiple development iterations for each property. This way, the team could easily compare the results and implications of each design approach. The total number of house lots possible in each development scenario, how much of the property could be placed under conservation, the estimated size and extent of on-site infrastructure and impervious surfaces, such as paved roads, driveways, and sidewalks, were some of the elements compared.

What jumps out in these comparisons is that infrastructure costs tend to be lower in conservation minded subdivisions rather than their conventional counterparts. In conservation developments, less land is razed and used up for private house lots, driveways, expansive yards and hardscapes, and roads and sidewalks. Clustering the horizontal infrastructure, residential and commercial structures to a small section of the property, sticking to a small development footprint, brings down horizontal construction and ongoing maintenance costs considerably. Because infrastructure costs are lower in conservation developments, and usually a lower number of house lots are yielded, infrastructure costs per lot are higher than in conventional developments. As infrastructure costs come down, profits soar due to price increases influenced by the overall appeal of on-site conservation lands, ample open spaces, and trails, as well as the high infrastructure per lot cost.

In this case, four different development scenarios were drafted for the

DARK GREEN CONCEPT 1

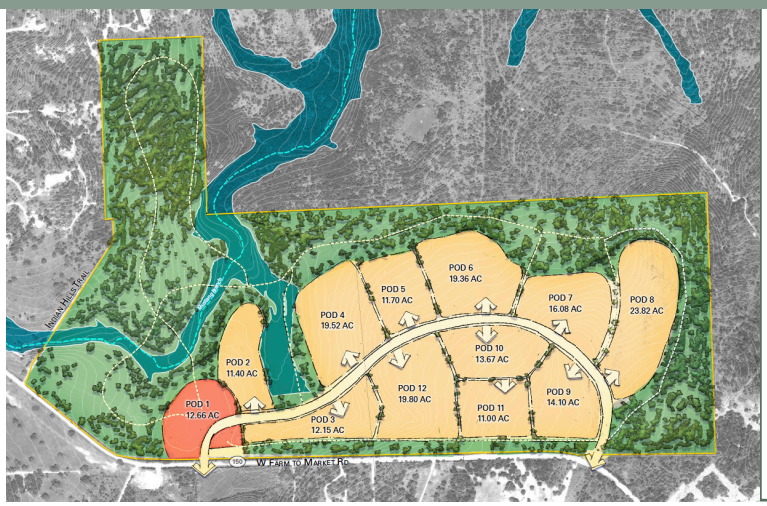
- 476 acres – Gross property
- 62% – Total conservation land
- Horizontal condo regime
  194 dwelling units
- Public water and advanced septic
- Assuming 1.6 units per acre

DARK GREEN CONCEPT 2

- 476 acres – Gross property
- 65% – Total conservation land
- Single-Family platted lots
  86 1-acre lots
  1 15-acre "conservancy" lot
- Public water and on-site septic
- Assuming 1-acre lots

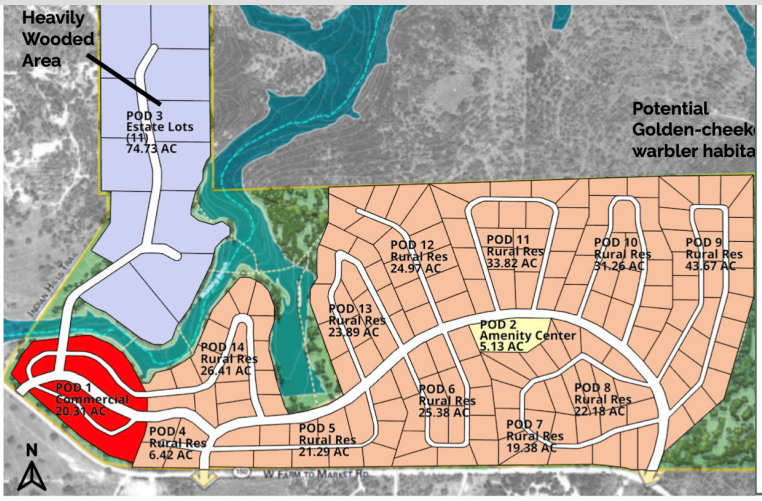
Michaelis tract, the westernmost tract of the charrette. First, the team drafted a typical conservation subdivision, what is referred to in the table above as Conservation Subdivision 1, and what the team referred to as the "Dark Green" concept earlier in this report. A second conservation concept, Conservation Subdivision 2, that supremely maximizes and prioritizes open space, was drafted by team member Randall Arendt, a conservation planner and author that has worked on a multitude of conservation developments around the nation, particularly in the northeast of the country. Next, the team drafted the "Light Green" concept, otherwise referred to as the Context-Sensitive Subdivision in the table above, that serves as a sort of "half step" between a conventional development and a true conservation development. Finally, the team drafted a conventional subdivision concept plan following what a typical

LIGHT GREEN CONCEPT



- 476 acres – Gross property
- 53% – Total conservation land
- Horizontal condo regime
  276 dwelling units
- Public water and advanced septic
- Assuming 1.6 units per acre

STANDARD CONCEPT



- 476 acres – Gross property
- 5% – Total conservation land
- Single-Family platted lots
  182 lots
- Public water and advanced septic
- Assuming 1.5-acre average lots for rural residential lots

developer would build on the property, maximizing the number of house lots to maximize profits – prioritizing house lots, infrastructure and roads over open space.

Not typical, the Conservation Subdivision 1 and Context-Sensitive Subdivision concepts yielded more residential units than the conventional plan. This higher unit count was made possible by implementing a horizontal condo regime, meaning one the property was not subdivided into multiple lots. The property is one lot, and residents can rent or own structures, but will not own the land. Both plans assume an average of 1.6 units per acre. A significant portion of the property was set aside for conservation in both concepts, 62% and 53% respectively, conserving on-site floodplain, heavily wooded land, and

golden-cheeked warbler habitat.

The Conservation Subdivision 2 concept, on the other hand, is a true and conservation development in that the property was subdivided into multiple smaller sized house lots, clustered together in one section of the property. In this case, 86 one-acre lots, and one 15-acre "conservancy" lot were planned once the conservation lands and open spaces were set aside. Very few roads were planned to keep infrastructure costs low, and were double loaded, containing house lots on both sides of the street, to maximize efficiency and circulation. Due to this significant clustering and efficient design approach, 65% of the gross property could be set aside for conservation and preservation.

In comparison, the Conventional Subdivision concept, like other typical developments, are subdivided without much regard for on-site ecologically sensitive areas. Typical developers, particularly in Central Texas and the Hill Country, design and sell large lots in an attempt to attract buyers with the dream of owning a large property with ample private lawn space. In the concept drafted, 182 residential lots were yielded, 171 1.5-acre lots, and eleven 6.5-acre estate lots. A 20-acre commercial center was also situated on the property to maximize sale and lease profits. In this conventional plan, only 5% of the property was set aside for conservation due to on-site floodplain and potential golden-cheeked warbler habitat.

PECAN WOODS TRACT

	CONVENTIONAL SUBDIVISION	CONTEXT-SENSITIVE SUBDIVISION	CONSERVATION SUBDIVISION
TOTAL UNIT YIELD	2,129	2,156	2,162
CONSERVATION LAND**	21%	53%*	59%*
TOTAL INFRASTRUCTURE CONSTRUCTION COST	$59M	$38M	$36M
INFRASTRUCTURE COST PER PLATTED LOT***	$40,320	$32,000	$30,000

* Open space conservation land consists entirely of flood plain land.

** The percentage of gross property that is dedicated to conservation land does not include any floodplain land unless explicitly stated.

*** Some Multi-Family lots may have multiple units.

Three different development scenarios were drafted for the Pecan Woods tract, the easternmost tract of the charrette. The team first drafted a conservation subdivision, the "Dark Green" concept, and the halfway step, context-sensitive subdivision concept. Once again, unusually, the professional team was able to achieve a higher unit yield than the conceptual conventional development plan prepared by SEC Planning for Walton Development, used with their permission. These two conservation minded developments were able to achieve 2,162 and 2,156 total units, respectively. The conservation concept yielding 1,012 Single-Family lots and 1,150 Multi-Family units, while conserving 59% of the property. Similarly, the context-sensitive concept yielded 1,152 Single-Family lots and 1,004 Multi-Family units, conserving 53% of the tract. Both on-site conservation lands are comprised of the entire property's flood plain land, steep slopes, and a natural spring.

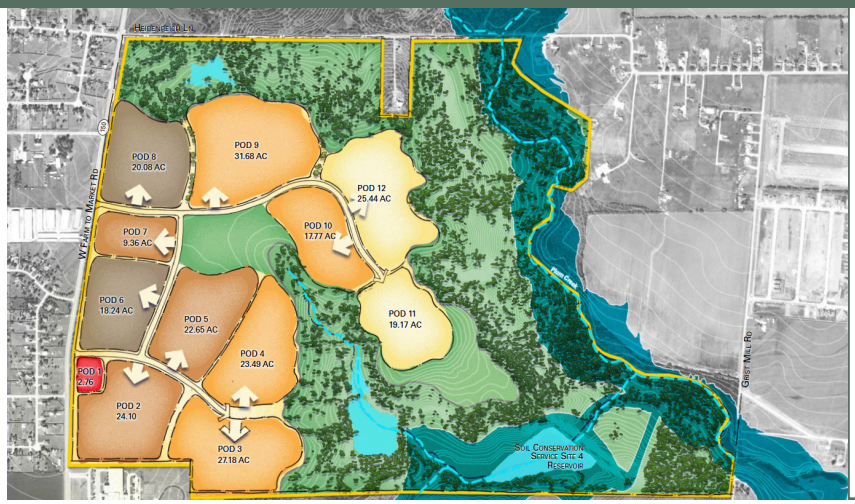
The conventional subdivision concept prioritized larger Single-Family lots and encroached on on-site ecologically sensitive areas more than the conservation minded plans. Although a slightly lower number of total units were yielded, the plan achieved to reach 1,718 Single-Family lots. Multi-Family units were kept low with just 411 total. The conceptual plan is committed to conserving 21% of the property, protecting flood plain land and steep slopes. The difference in total number of units is a little deceiving as the conservation minded plans have built highly dense Multi-Family structures in an effort to maximize unit yield, and in turn, sale and lease profits.

CONCLUSION

When designed carefully, creatively, and with an eye toward conservation and return on investment, conservation developments – true conservation subdivisions, and even context-sensitive or "light green" subdivision designs – have the ability to be "twice green: green environmentally and green economically" (Randall Arendt 2021). It is possible to build subdivisions in a conservation oriented manner that are highly profitable and provide benefits to the broader community and natural landscape. This is proved in the wild success of a multitude of thriving conservation subdivisions around the nation, as well as the rough concepts developed in the multiday design charrette.

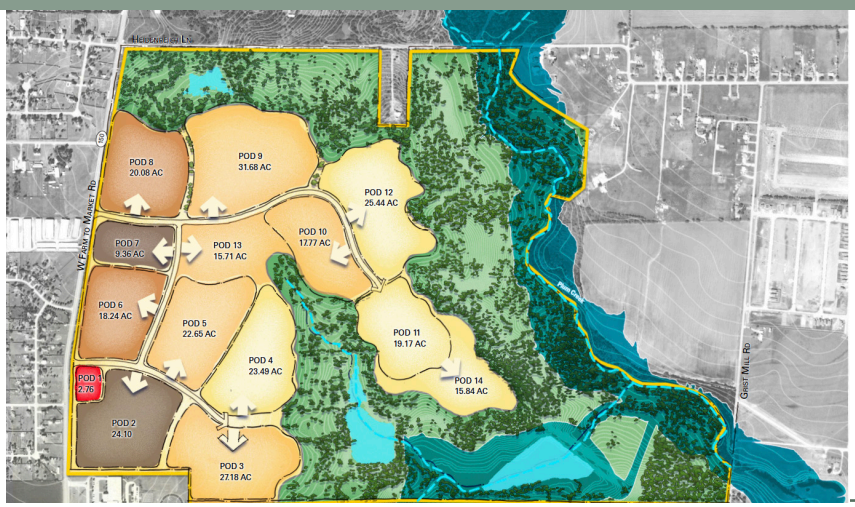
While there are many innovative ways to get unit yields up, resulting in in increased profits, such as implementing horizontal, and even vertical, condo regimes, or building highly dense Multi-Family structures, prioritizing return on investment when designing a conservation development doesn't come without its sacrifices and hard decisions. Private property and private yards are sacrificed to maximize the size and extent of the conserved open spaces. More units means more residents and traffic, putting a strain on the built infrastructure, and increasing air and water pollution, among others.

DARK GREEN CONCEPT



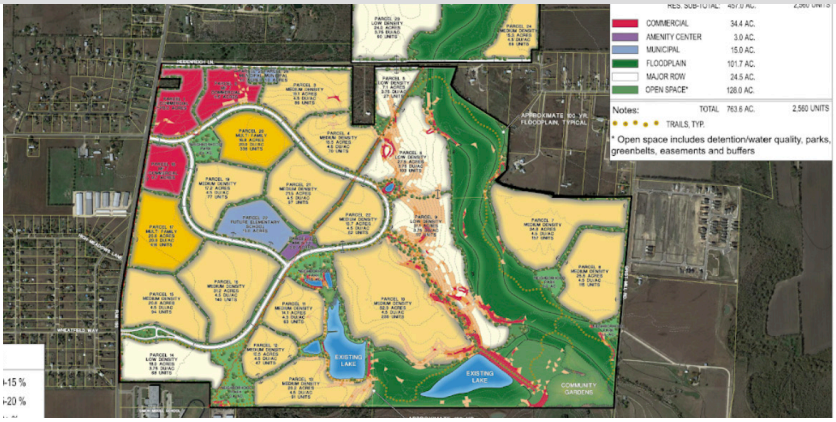
- 622 acres considered – Gross property
- 30% – Total conservation land
- 2,156 – Total units
  - 1,808 lots Single-Family platted lots
  - 752 Multi-Family units
- Public water and sewer

LIGHT GREEN CONCEPT



- 622 acres considered – Gross property
- 53% – Total conservation land
- 2,162 – Total units
  - 1,012 lots Single-Family platted lots
  - 1,150 Multi-Family units
- Public water and sewer

STANDARD CONCEPT



- 622 acres considered – Gross property
- 30% – Total conservation land
- 2,129 – Total units
  - 1,718 lots Single-Family platted lots
  - 411 Multi-Family units
- Public water and sewer

CONSERVATION FACILITATES

BENEFITS TO NATIVE SPECIES AND LAND PROTECTION

The conservation development approach includes the preservation and management of existing open space within and adjacent to conservation development projects. The benefits of open space conservation are varied and can include the following advantages for local flora and fauna:

- Preserving existing open spaces and wildlands in their current state facilitates habitat conservation for common and rare species alike. Rare species with narrow habitat parameters might benefit the most from existing open space conservation as the Hays County human population increases.

- Enhancing preserved open space (e.g. planting trees, invasive species removal) can increase the habitat value for common and rare species alike.

- Carefully considering nature preserve design can increase wildlife habitat viability by adding protected spaces adjacent to existing protected spaces, or by creating open space corridors between existing or proposed nature preserves.

- Maintaining vegetated open space within or adjacent to a development minimizes disturbance to the natural ecological processes of the landscape (e.g. stormwater runoff filtration, carbon sequestration).

- Vegetated open spaces facilitate water infiltration into the soil, slowing movement of water across the landscape, and reducing potential flooding during heavy rainfall.

- Planting pollinator friendly grasslands can increase habitat value for birds, bees, and other beneficial insects; in addition to creating aesthetically pleasing viewsheds.

- Open space preservation protects viewsheds and can create a sense of peace and place for residents.

- Recreational activities (e.g. hiking, swimming, fishing) within preserved open space is enhanced for users as opposed to more developed localities, leading to higher quality of life.

- Preserved open space can increase home values and increase desirability of nearby residences.

Much like the benefits for open space preservation, watershed protection is a multi-faceted goal benefiting ecosystems and quality of life in Hays County alike:

- Protecting floodplain vegetation and instituting floodplain setbacks promotes natural stormwater filtration and minimizes flooding by slowing overland flow as it moves towards waterways.

- In addition, protecting floodplain vegetation and instituting floodplain setbacks can reduce nutrient loads and pollution within streams, as well as provide necessary shade, which can reduce algal blooms.

- Utilizing vegetated filtration and bioswales filters stormwater runoff and slows overland flow, which can reduce localized flooding during heavy rain events.

- Xeriscaping using native plants increases habitat value for wildlife and reduces water usage, which leaves more water within waterways and aquifers.

- Clean waterways protect Texas' endemic fauna (including federally protected species like the fountain darter.)

- Protecting recharge features with vegetated setbacks protects water quality in the aquifers, which protects drinking water for humans and subterranean habitat for Texas' endemic fauna (including federally protected species like the San Marcos salamander).

- Minimizing increased impervious cover impacts to watersheds through conservation development elements such as rainwater capture, narrow roads, and porous asphalt can reduce potential flooding during heavy rainfall and reduce sediment mobilization into local waterways.

- Clean waterways enhance recreational opportunities such as swimming, kayaking, and fishing.

- Clean waterways reduce municipal filtration costs for drinking water.

OPPORTUNITIES FOR INTEGRATION WITH RHCP

A more robust and effective conservation design policy in Hays County offers opportunities to integrate with, and reinforce, existing habitat conservation plans in the County.

Specifically, the 2010 Hays County Regional Habitat Conservation Plan (RHCP) provides incidental take coverage for the golden-cheeked warbler (Setophaga chrysoparia) and the black capped vireo (Vireo atricapilla – now delisted due to recovery) resulting from land development activities. The RHCP offers a streamlined participation process in return for implementing a coordinated conservation strategy that addresses the conservation needs of the warbler,

vireo, and a variety of other species. The RHCP addresses 40 “evaluation species” (not protected under the ESA but could become protected in the future) and 16 “additional species” (mixture of protected & unprotected species not covered by the RHCP) that could benefit from conservation activities promoted in this report.

Benefits of project enrollment within the RHCP include expedited incidental take coverage (saves time and money), Endangered Species Act (ESA) assurances which provide certainty for future obligations (i.e. “no surprises” for the project proponents), and clear guidelines for maintaining ESA compliance. Hays County is also obligated to create a preserve system focused on protecting up to 15,000 acres of golden-cheeked warbler habitat during the 30-year RHCP permit duration. In essence, the RHCP is designed to benefit both development and rare species at the same time. This report is also designed to benefit sustainable development that meets certain conservation goals and objectives. As such, the RHCP is a compatible program with strong potential for integration to the implementation plan in this document.

The menu of options matrix scoring system, covered later in this report, helps developers and landowners determine which conservation-oriented items could be implemented to determine eligibility for incentives. The scoring system includes multiple items related to habitat protection that could benefit the golden-cheeked warbler and other rare species in Hays County. Additionally, this report could leverage its scoring system to integrate the RHCP in the following ways:

- Potential golden-cheeked warbler habitat could be exchanged to Hays County either as a conservation easement or by providing preserve land in-lieu of mitigation fees.

- Restore degraded or low-quality golden-cheeked warbler habitat, thereby increasing the number of credits available to the RHCP. The menu of options includes incentive points for restoration and/or preservation of habitat, native plant communities, and other critical environmental features.

- Protect recharge features (e.g. caves, sinkholes) to reduce impacts to habitat for terrestrial karst invertebrates and springs inhabited by Eurycea salamanders along with other aquatic karst invertebrates. Most of the RHCP evaluation and additional species are dependent upon karst habitat, so protecting recharge features can benefit these species, some of which may become federally protected under the ESA and could eventually be covered by the RHCP through an amendment.

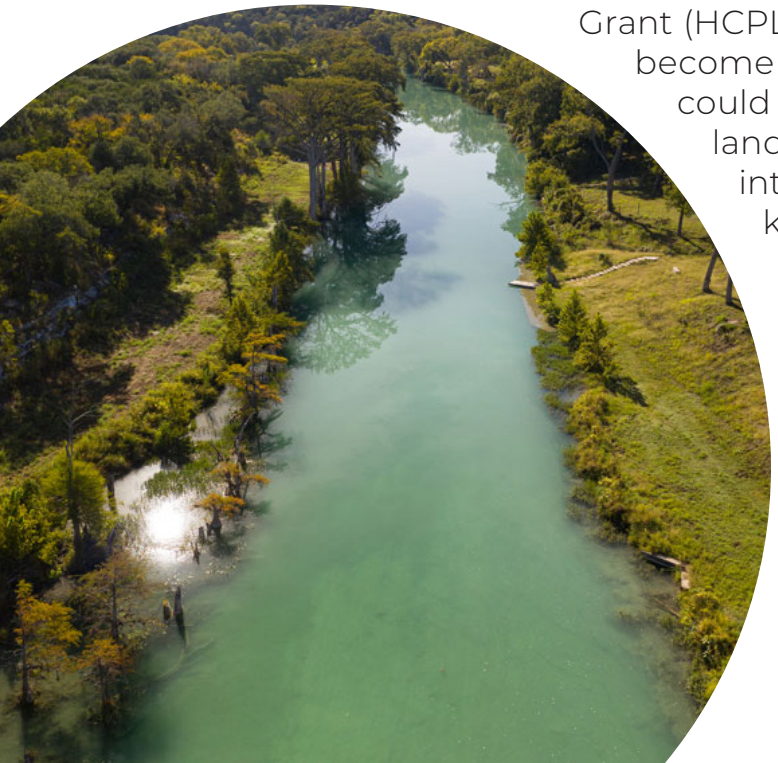
- Protect waterways in general and ones containing rare species of freshwater mussels. Hays County is home to two newly described mussel species, both of which are candidates for protection under the ESA and are considered additional species by the RHCP. These freshwater mussel species could eventually be covered by the RHCP through an amendment, if they become federally protected under the ESA.

Moreover, the County might use the RHCP to help provide incentives in the following ways:

- The RHCP considers a wide range of potential impacts to rare species within Hays County. The conservation goals and objectives set forth within the RHCP provide an existing set of guidelines for a wide array of imperiled organisms, including the golden-cheeked warbler, karst dependent species, and aquatic species. The RHCP could be amended to include no take or low take guidance for rare species that incorporate conservation development elements.

- The RHCP already provides a path to incidental take coverage for the golden-cheeked warbler with the existing enrollment system and by maintaining golden-cheeked warbler credits. Project proponents have an existing program they could utilize for both their incidental take needs and for their own conservation programs. The County can make explicit recommendations for developers to enroll their potential golden-cheeked warbler habitat (i.e. mature, closed canopy oak-juniper forest) in the RHCP for anticipated impacts. The County could even consider enrollment of potential golden-cheeked warbler habitats within the RHCP as one of the “must have requirements" listed on the menu of options matrix.

- Section 6 of the ESA authorizes the U.S. Fish and Wildlife Service to provide financial assistance grants to support implementation of conservation programs for protected species. The RHCP could be amended to fully integrate the conservation goals and objectives of the County and/or add additional species for coverage by applying for a Habitat Conservation Plan Land Acquisition Grant (HCPLAG). A HCPLAG has the potential to become an additional incentive Hays County could distribute to eligible developers and landowners as an incentive to set aside the internal buffers around waterways and karst features, which benefit the goals and objectives discussed by the RHCP for evaluation and additional species. No amendment to the RHCP is needed to apply for a HCPLAG. However, Section 6 grants cannot be utilized to replace mitigation, minimization, or monitoring obligations set forth under the RHCP.



WATER QUALITY AND STORMWATER MANAGEMENT: LOW IMPACT DESIGN AND BEST PRACTICES

Under natural conditions (pre-development), rainfall and stormwater runoff have unimpeded access to the soil surface. This excess rainfall and stormwater runoff recharges the groundwater supply. The natural landscape provides a certain level of infiltration and cleansing, and the long-term quality and abundance of available water is improved. The topography and layout of the natural landscape is inherently designed to handle excess rainfall and stormwater. Razing and pouring concrete over natural lands disrupts the natural flow and drainage of surface and stormwater over the landscape. If not carefully controlled, development and sprawl can ultimately be detrimental to a region by increasing the frequency and severity of stormwater and flood events, and decreasing an area's water quality.

Conservation development runs hand-in-hand with low impact design (LID) and green infrastructure (GI) practices. LID and GI measures can further improve runoff quality, and help mitigate flooding in developed, or developing areas within conservation developments, helping address impervious cover and constructed drainage conveyance systems. LID and GI features – relatively new, but a proven and widely successful concept – aim to mimic a site's natural hydrology as it is developed. Stormwater is managed on-site and is typically reused in various fashions. Two of the most common LID and GI features, often overlooked because they are usually heavily landscaped and appear to be amenity features, include:
rain gardens – slightly depressed areas on the land that are heavily landscaped and occasionally contain water during peak storm events – and,
green roofs – often seen as a luxurious landscape amenity, but which can provide a plethora of benefits, from helping provide insulation to a building to slowing the flow of, and filtering, excess rainfall and stormwater, as well as reducing urban heat island effects.

The purpose of these approaches is to slow overall runoff, soak it in the ground, spread it, save it for future use, and, if possible, to catch the rain

where it falls. In other words, the idea is to reduce stormwater runoff volume and put excess water to use for non-potable purposes such as watering lawns, irrigating medians and landscape areas, toilet flushing or washing machines. This green design approach will significantly reduce the drainage conveyance cost of storm drains, detention ponds, and water quality basins, thus, limiting the amount of stormwater to be conveyed off-site. Often, if GI and LID can be maximized, the need for large stormwater detention and water quality basins – costly items to construct, maintain, and locate on a development, due to their typically large footprint – are minimized, if not entirely eliminated. Other Low Impact Design and green infrastructure measures include, but are not limited to:

- Natural area protection and vegetation management
- Tree preservation
- Buffer zones for ecologically sensitive areas
- Reduced impervious cover
- Innovative civil engineering designs such as ribbon curbs, narrower streets and driveways, and sidewalks on one side of the road
- Rain gardens
- Bioretention cells
- Vegetated filter strips
- Bioswales
- Porous/ permeable pavements
- Tree boxes
- Soil amendments/ native soils/ soil depth/ reduced turf
- Rainwater harvesting, collection, and reuse
- Green roofs
- Sustainable, drought-resistant landscaping with native plantings
- Limited disturbed area during construction to reduce the potential for sediment and pollutant discharges, complying with Hays County the Texas Commission on Environmental Quality criteria.

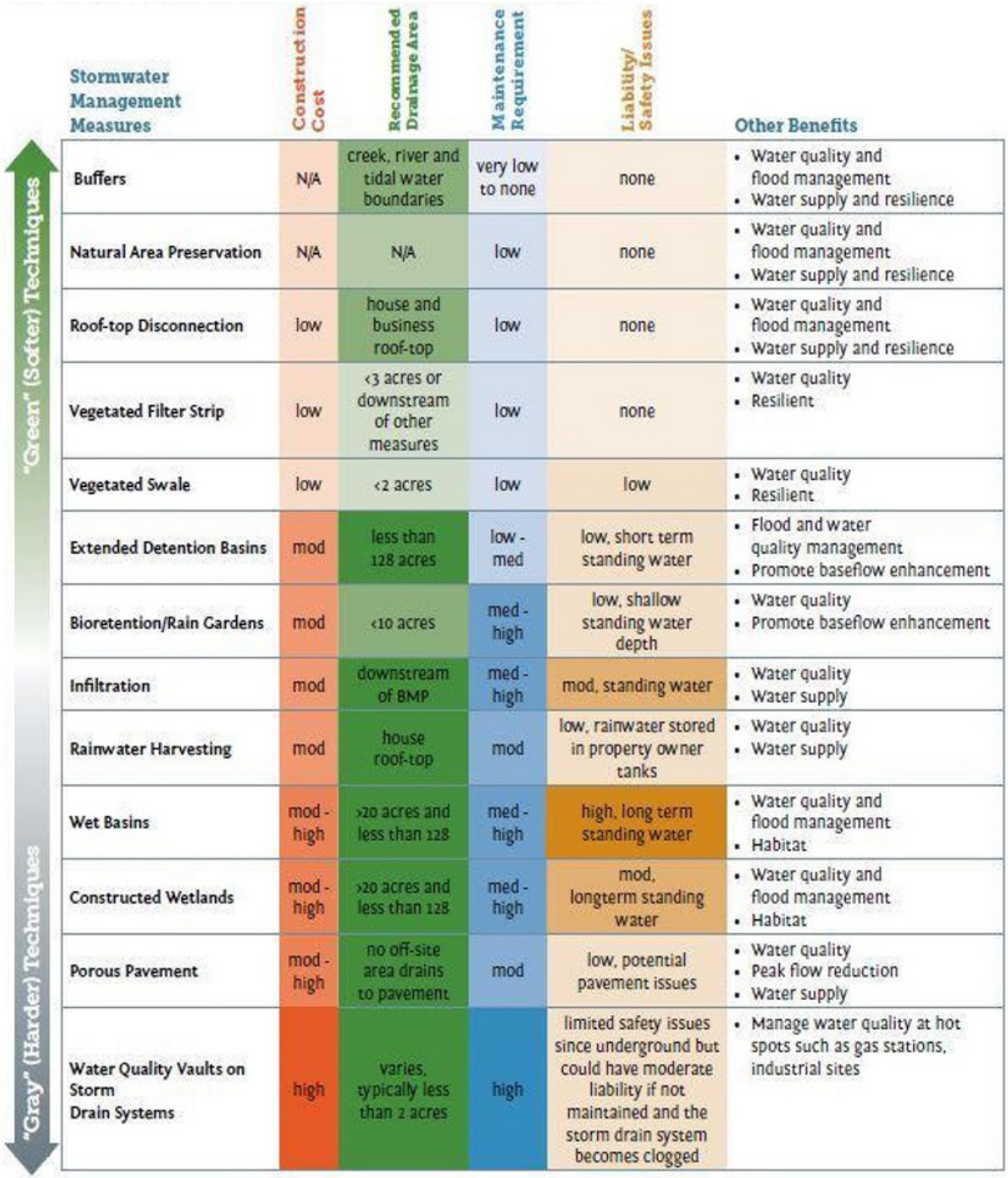
Many of these measures are incorporated into the goal-and-incentive policies recommended in this report. These measures can be used in combination with each other, and tailored to best fit the planned development topography, soils, impervious cover layout, and natural environmental features.

Many aspects of development and subdivision construction can contribute to flooding and the degradation of streams or underground water supplies. This can be true of typical street and drainage networks, with curbs, storm drain inlets, pipes, and outfalls that sometimes significantly increase peak flow rates and runoff volume, in turn increasing downstream flooding while pollutants, fertilizers, pesticides, oil, and nutrients are swept into the receiving waters. The vast majority of proven and successful conservation development standards and ordinances implemented in recent decades throughout the nation are designed to minimize these drainage challenges by reducing curb and gutter systems, using roadside swales, and implementing low-impact development designs to minimize impervious cover levels.

Incentives promoting and encouraging LID can provide stormwater credits for eligible developments and be designed to reduce the effective impervious cover of a planned development to 20 percent or less. By employing these measures (porous pavement, rainwater harvesting, soil amendments, conservation landscaping, disconnection of roof-top runoff, and natural area preservation), a developer can build a subdivision that protects water quality, catches rainwater at the source, reduces runoff volume, shrinks the stormwater footprint, and minimizes long-term maintenance requirements. Technical conservation measures similar to the ones recommended in this report – have been proven effective in other jurisdictions across the country, and in experiments close to Hays County. The 2006 LCRA Highland Lakes Watershed Ordinance has inspired more than 80% of all conservation development projects in the area, a prime example of effective and easy-to-use incentives and credits that successfully guided the implementation of more stewardship minded development.

A summary of stormwater practices, their application, cost comparisons, and benefits are summarized in the following chart produced by the General Land Office (GLO) Stormwater Retrofit Resiliency Design Guide. It outlines how stormwater practices can mitigate flooding and improve water quality. It is noted that one size does not fit all situations, as soils, topography, and development constraints can limit options in one circumstance, while in other areas of a region, or a county, multiple solutions might function well, and even overlap.

STORMWATER MANAGEMENT MEASURES



Stormwater Management Measures	Construction Cost	Recommended Drainage Area	Maintenance Requirement	Liability/ Safety Issues	Other Benefits
Buffers	N/A	creek, river and tidal water boundaries	very low to none	none	• Water quality and flood management • Water supply and resilience
Natural Area Preservation	N/A	N/A	low	none	• Water quality and flood management • Water supply and resilience
Roof-top Disconnection	low	house and business roof-top	low	none	• Water quality and flood management • Water supply and resilience
Vegetated Filter Strip	low	<3 acres or downstream of other measures	low	none	• Water quality • Resilient
Vegetated Swale	low	<2 acres	low	low	• Water quality • Resilient
Extended Detention Basins	mod	less than 128 acres	low - med	low, short term standing water	• Flood and water quality management • Promote baseflow enhancement
Bioretention/Rain Gardens	mod	<10 acres	med - high	low, shallow standing water depth	• Water quality • Promote baseflow enhancement
Infiltration	mod	downstream of BMP	med - high	mod, standing water	• Water quality • Water supply
Rainwater Harvesting	mod	house roof-top	mod	low, rainwater stored in property owner tanks	• Water quality • Water supply
Wet Basins	mod - high	>20 acres and less than 128	med - high	high, long term standing water	• Water quality and flood management • Habitat
Constructed Wetlands	mod - high	>20 acres and less than 128	med - high	mod, longterm standing water	• Water quality and flood management • Habitat
Porous Pavement	mod - high	no off-site area drains to pavement	mod	low, potential pavement issues	• Water quality • Peak flow reduction • Water supply
Water Quality Vaults on Storm Drain Systems	high	varies, typically less than 2 acres	high	limited safety issues since underground but could have moderate liability if not maintained and the storm drain system becomes clogged	• Manage water quality at hot spots such as gas stations, industrial sites

In summary, conservation development combined with low impact development and green infrastructure practices can protect valuable natural resources, floodplains, and critical environmental features in Hays County. Employing the various stormwater management measures in the appropriate locations to slow, soak, spread, and save runoff can protect water quality and minimize downstream flooding. These “green” measures are typically more cost effective to implement than traditional large stormwater basins, less costly to maintain, more attractive, and can reduce water demand (for such things as irrigation) within subdivisions, further protecting Hays County’s fragile natural resources, especially in times of drought. Proper site planning is essential up front, informed by engineers, planners, and landscape architects who understand what techniques should be used in the County’s diverse topographic and soil conditions. Low Impact Design and Green Infrastructure initiatives help make a conservation development truly sustainable and provide maximum benefit to the surrounding natural landscape. Developments that efficiently incorporate Low Impact Design and Green Infrastructure initiatives have the potential to create more sustainable, resilient, and healthy communities. This is why the proposed policies in this report rely heavily on incentivizing these kinds of measures. The County is now at work on updating its own stormwater guidelines. Over the long run, the County should consider further incorporating LID and GI design into its own construction and maintenance plans, and might look for additional ways to “routinize” the review and acceptance of green development in more traditional subdivision developments, in addition to facilitating the more comprehensive conservation designs addressed in this report.

ALTERNATIVE APPROACHES:
CONTEXT-SENSITIVE / GREENWAY SUBDIVISION DESIGN

Through the feasibility exercises that were developed as part of this report, particularly through the design charrette process, the consultant team realized that – with the wide variety of natural landscape in Hays County, and with dramatically different market conditions, wastewater access, and geologic conditions in different precincts of the County – regulatory flexibility will be a key component to success.

That's a significant reason for the team's recommendation that the County use development agreements as a primary regulatory tool for the conservation design and incentive program, at least initially. In addition, after testing various development scenarios and market conditions in the charrette exercise, the planning team came to believe that the County should consider future development of a second conservation-friendly set of standards. This would be a halfway step, something short of full conservation design, but achievable – and useful to conservation efforts – when tract size, market conditions, or the prevalence of floodplain, for instance, make "true" conservation design impractical. The team named this approach "context-sensitive," or "greenway" design – also referred to as "Light Green" in the design charrette section – which imagines such design would serve as an additional alternative to conventional developments.

Context-sensitive subdivisions, sometimes revolving around limited, "cluster developments," are a viable alternative to the conservation development approach, where one portion of the project development is protected and conserved while the other may be developed in a high-density pattern. In these conservation design subdivisions, with a recommended minimum tract size of

approximately 100 acres or greater, large areas of land are protected while others are developed relatively densely, affording the developer potential to generate economic returns and to create affordable living opportunities for new residents.

Context-sensitive developments follow conservation principles and practices but have a sustained focus on maximizing lot yield. This alternative was further teased out and tested during the design charrette workshop.
In certain areas of the County, particularly with a high percentage of undevelopable land, such as floodplain and steep slopes, context-sensitive developments may be more feasible for certain developers, particularly small-scale developers.

Although there are technical details to work out before making incentivized context-sensitive developments a formal alternative for developers in the County, the team and this final report recommend forming an incentive structure to promote this type of green-minded development. Conservation development, and development agreements through local government, are highly site-specific, and what could work on and be offered to one property may not be applicable for another. The multi-disciplinary professional team strongly encourages developing this halfway step option to provide certain (lesser) economic incentives to developers whose projects do not meet some of the minimum threshold requirements a true conservation development achieves. Threshold requirements that could be relaxed in certain development situations include:

Gross property size.
Although conservation developments are most efficient and provide the most benefits to the surrounding natural environment if they are larger in size, conservation and preservation of the natural landscape is important and feasible everywhere. Rather than requiring a tract to be more than 100 acres in size, smaller parcels, and smaller scale developers, could build green, context-sensitive subdivisions.

Open space conservation and floodplain land.
Rather than allowing a development to count up to 50% of its on-site floodplain toward the 50% open space minimum requirement, a context-sensitive subdivision, for example, could count up all on-site floodplain land (undevelopable land) to meet the 50% open space conservation threshold.

Horizontal condo regimes.
In some circumstances, particularly on tracts of land that are largely made up of ecologically sensitive areas, development must be focused and clustered in one specific area. To ensure a high return on investment, some developers and landowners may find that implementing a horizontal condo regime –

one massive lot that has not been subdivided, where residents only own the structures and not the land – is the best option for development.

Under a context-sensitive subdivision process, developers and landowners would still be required to demonstrate that conservation-minded initiatives – and associated green infrastructure – would be implemented throughout the development, in order to merit County recognition and incentives. Such a program would address a significant number of subdivisions and "resubdivision" projects in the County.

Developing a second set of specific, detailed guidelines was beyond the scope of this report, and the consultant team sees no reason to delay implementation of the report's primary focus while a second set of guidelines are considered. Rather, the team recommends that the County move forward with the proposed new "conservation development" initiative as soon as possible, and then, when practicable, roll out complementary guidelines as the half-step, "context-sensitive subdivision" program. This has the added benefit of giving County staff the opportunity to refine implementation techniques as they navigate the first conservation design subdivisions and institute new internal procedures to manage conservation design applications. In the interim, if a suitable context sensitive subdivision prospect presents itself to the County, staff and the Commissioners Court can make case-by-case determinations, and look to this report and its recommendations for general guidelines, citing the recommendations and qualifications of this section as a starting place for consideration.

TRUE CONSERVATION DESIGN

CONTEXT-SENSITIVE DESIGN

THE NEED FOR
BALANCED INCENTIVES

The County's original conservation development standards have not worked as originally intended. To date, no true conservation development has ever been built within Hays County. The current regulations are too restrictive and do not properly incentivize developers and landowners in order to effectively motivate, influence, and encourage the building of true conservation development.

By providing a variety of public recognition and economic incentives, which ultimately translate to either cost savings or market advantage, the consultant team – and a large body of stakeholders – are convinced that developers and landowners will be more inclined to set aside significant portions of a tract's developable and undevelopable land for permanent open space conservation, implement green infrastructure initiatives, and adhere to reworked conservation development standards. The incentives enumerated in this report are tied to commitments by would-be developers. In essence, the incentives are intended to link public goals and performance standards to rewards in ways that will convince more applicants to venture into conservation design.

This report purposefully refrains from committing the County to exact incentives or a rigid reward and regulatory structure. Rather, it expresses principles, goals, guidelines, and a menu of options. As noted elsewhere, this is because the team recognizes that development, particularly in the County setting, is highly individualized. Every tract of land is subject to different site restraints and conditions. Counties operate in a different regulatory environment than cities, due in part to statutory and (state) constitutional limitations.

By laying out specific goals, accompanied by potential incentives, left intentionally broad but organized into categories related to performance, the County will this way retain the flexibility to negotiate on behalf of the public interest in good faith, and in a predictable fashion. Potential developers, landowners, and applicants will have a clear list of enumerated goals and guidelines, and are free to mix and match conservation initiatives that best suit their project, provided they incorporate enough goals to meet minimum "point" thresholds. In this way, too, the County Commissioners Court and staff can assess the value of a developer's proposal to the public good.

BEST PATH FORWARD:
DEVELOPMENT AGREEMENTS

Most traditional subdivisions in Texas are governed primarily by Chapter 232 of the Texas Local Government Code, which lays out county authority to regulate the subdivision of land. The existing Hays County regulations are more sophisticated, and seek to take a more holistic approach to the regulation of development in the unincorporated areas of the County by collecting directives – and grants of authority – from many different references across various state codes. This includes the health and safety code, the property tax code, the water code, the transportation code, and others, in addition to Chapter 232 and other parts of the Local Government Code. Hays County has been among the leaders of Texas counties in seeking to adapt sometimes antiquated state laws to the realities of an urbanizing state. A number of other urbanizing counties have modeled their rules after Hays County's early efforts.

Within this context, Hays County already authorizes conservation design developments in Chapter 765 of its development regulations. However, as discussed already in this report, the existing regulations have not succeeded in facilitating the development of conservation design-oriented subdivisions. When considering how to structure new guidelines, and recommendations for a new regulatory process, the consultant team first considered simple amendments to the existing Chapter 765.

During the course of the project, the team determined that a more radical change in regulation would better serve the County. This led to the development of the recommendations detailed in the accompanying

chapters of this report. Moreover, instead of presenting a new draft of Chapter 765, the consultant team – in consultation with the County's oversight team – determined that as part of this new regulatory approach, the County should rely on a useful and flexible tool provided by the Texas Legislature.

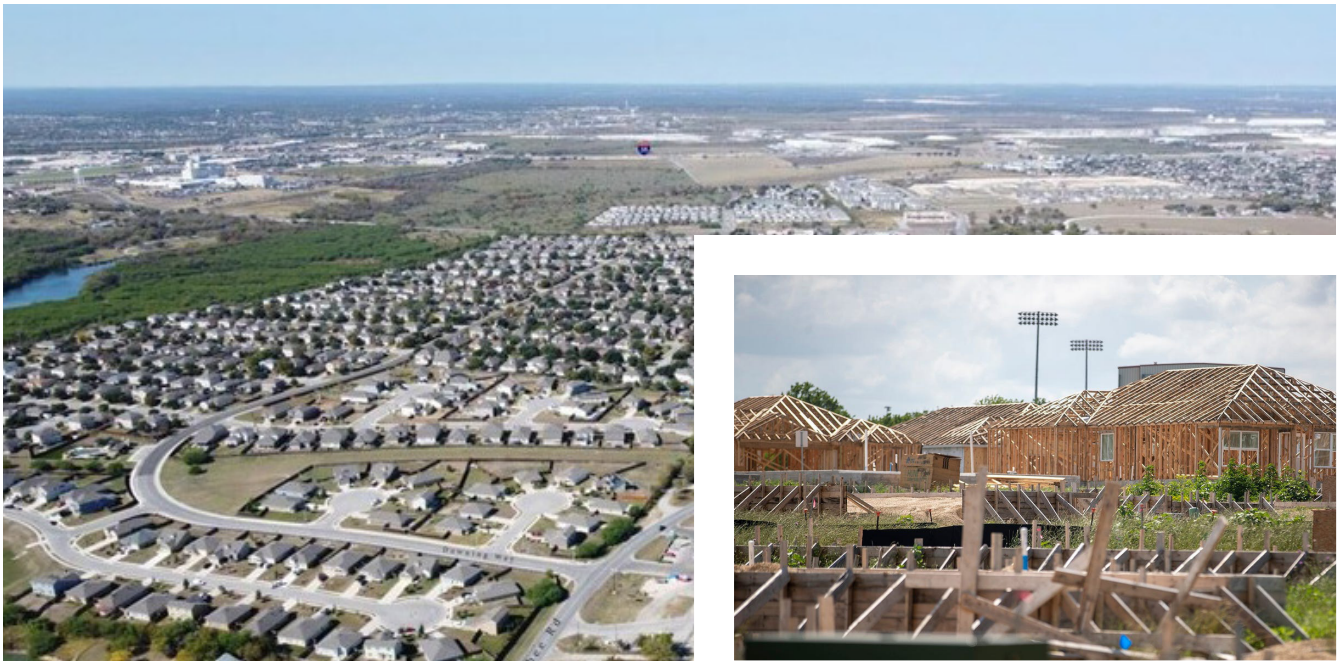
> That tool is **Chapter 381 of the Texas Local Government Code**, which explicitly allows the County to provide incentives to developers for certain public purposes or in exchange for public benefits. These "381 agreements," or "development agreements," offer the County the kind of **negotiating flexibility** that is absent from the normal subdivision process outlined in Chapter 232.

With careful guidelines, and publicly published goals that tie to creative incentives, development agreements can be structured that not only protect but enrich the public interest. Still, it is clear that the County will need to maintain its standard subdivision process as an option. Many developers will not be interested in conservation design (at least until there are more examples on the ground in Hays County); some tracts of land will not be suitable. What's more, state law dictates that subdivision review and approval must be offered by Texas counties as a ministerial function – meaning, if a developer meets certain conditions prescribed by the state, then a County shall approve the developer's application. Counties have some limited authority to pick and choose among standards, and Hays County has incorporated an innovative patchwork of other statutes in order to gain an added measure of regulatory review. In general, Texas counties may enforce basic health and safety concerns, and require adequate roads, drainage, and waste disposal, but are prohibited from zoning, or from many other development controls, and may not simply reject subdivision applications because of concerns about growth, style of development, aesthetics, or the absence of conservation features.

Yet, there is nothing that prohibits counties from offering an alternate route to approval – a conservation option for developers that "opt in" – so long as the Chapter 232 path remains open as well. That opt-in concept forms the basis of the conservation development recommendations in this report. It provides

both the County and developers the chance to create a better win-win solution, one that goes well beyond the outdated confines of traditional Texas county development authority, which was conceived in an age when most of the state was dominated by rural farmsteads and horse-and-buggies.

Chapter 381, and its conception of flexible development agreements to further the public interest, has rarely (if ever) been used in Texas as the primary vehicle for an organized, county-wide effort to facilitate conservation development. But it is well-suited to the task. Moreover, Hays County officials, including development staff, members of the Commissioners Court, and the general counsel's office, are well-versed in Chapter 381 agreements from economic development projects, as well as past negotiations with individual developers over a variety of issues. The County's planning and consultancy team sees the 381 option as a viable and practical way to implement conservation design agreements and the associated recommendations of this report, to the benefit of the citizens of Hays County. Finally, by using Chapter 381, the consultant team believes the County can move forward with implementation faster, more efficiently, and more effectively than by trying to develop detailed legislative language and specifications to cover every contingency. As time goes on, and laws and circumstances change, the Commissioners Court may examine the efficacy of using 381 agreements as the main focus for conservation design implementation, and consider whether to tweak the guidelines in this report, or experiment with new regulation. But, for now, the team recommends the County embrace the opportunity and flexibility offered by using Chapter 381 as the primary tool to achieve its goals.



CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

NINE MAJOR CATEGORIES OF CONSERVATION GOALS AND STANDARDS

To achieve the various conservation goals mentioned throughout this report, the County and professional consultant team identified nine basic conservation goal categories that developers, landowners, and applicants, in other words, conservation developments, should adhere to.

Nine Conservation Goal Categories:

- Reduce Impervious Cover
- Open Space Conservation
- Water Recapture and Reuse
- Water Quality and Conservation
- Floodplain and Stream Buffer Protection
- Habitat Protection
- Cultural and Historical Preservation
- General Health and Recreation Enhancement
- Fiscal and Community Responsibility

After a robust feasibility study, and following multiple discussions with major local and regional stakeholders, an interactive menu of options matrix is highly recommended for the County to implement in the augmented conservation development guidelines. The matrix would help developers and landowners determine whether their tracts and development plans are eligible to be certified as a conservation development in the County. A wide variety of conservation and green infrastructure initiatives and features, with a specific number of points that could be awarded to a project dependent on certain thresholds, are available for projects to pick and choose. Depending on the total number of points awarded, a project will be eligible for a number of economic incentives.

A project would be well on its way to being certified as a conservation development within the County if the following four prerequisite thresholds are satisfied:

(1) **Minimum tract size of** approximately **100 acres**,

(2) **Minimum of 50% open space conservation** across the gross site is permanently protected and conserved, up to 50% of the property's on-site floodplain land (undevelopable land) can be counted toward this threshold,

(3) **Maximum of 20% impervious cover** is applied, calculated across the entire tract, and

(4) The developer can ensure that **no direct sewage and wastewater discharge** will reach on-site and adjacent creeks and streams.

Once the prerequisite thresholds are met, a developer can then move through the matrix, selecting specific green and conservation-oriented features to be awarded points in order to be eligible to receive economic incentives. Developers can pick and choose which goals to meet, and at what level Each available green infrastructure feature and threshold, outlined in the matrix, come with specific basic standards and requirements that must be met in order for a developer to be awarded the associated points. How well a developer meets certain criteria directly translates to points and incentives. Each criteria is backed up by a County, or regional environmental entity's best management standards for conservation.

For example, conserving more than 75 percent of the gross tract for open space conservation land will award a developer the maximum points in the Open Space Conservation category.

For the full list of matrix standards, and to take a closer look at the menu of options matrix, please refer to the Appendix.

RECOMMENDED
ECONOMIC INCENTIVES

VIABLE INCENTIVE CATEGORIES AND REWARDS

In order to effectively promote and encourage developers and landowners to build conservation developments, Hays County must implement and offer a number of economic incentives.

Depending on the number and types of conservation and green infrastructure initiatives implemented – ultimately, the total number of points scored in the interactive menu of options matrix – directly speaks to the conservation goal category, and therefore rewards, developers could be granted by the County. Of the nine major categories in the matrix, a maximum of ___ total points are possible. A development must meet all prerequisite thresholds and score a minimum of ___ points to qualify for the lower rung of economic incentives. Once a development qualifies, by scoring ___ or more points, it is eligible to receive incentive rewards cumulatively, listed in the three economic inventive categories: Silver, Gold, and Platinum.

A variety of economic incentives are available. All incentives listed are items the County could offer an eligible and qualifying development, but are not guaranteed to offer. As the County moves forward with implementing the augmented conservation development standards, Chapter 765 in the County's development regulations, other incentives may be realized and awarded. Several economic benefits would require collaboration and negotiation with local jurisdictions in order to be formally realized and awarded, such as unified reviews and inspections.

The Silver category, the most basic incentive category, offers incentives that provide a moderate cost savings and some design flexibility. Reduction in street pavement width requirements, for example, would allow developers to design narrower streets and travel lanes, reducing overall impervious cover, lowering infrastructure construction costs, and promoting slower drive speeds throughout the development. Unified reviews and inspections – streamlining the permitting process by allowing concurrent reviews and approvals of particular permits – through both the County and local jurisdictions, could shorten the overall project timeline and construction schedule, saving the developer professional and mobilization fees.

Incentives in the Gold category offer slightly more robust economic incentives. Density bonuses allowing developers to build at a denser rate, meaning more residential units per acre, could significantly increase the potential of high economic return. Mitigation credits offered at a discounted rate – credits developers must purchase to offset the negative impacts that are associated with developing the natural environment – could provide relatively high cost savings for eligible developers.

The Platinum rewards are the most difficult to achieve but provide the most substantial economic incentives for developers. Significant economic benefits such as PID (public improvement district) funding – a special district that is created through a public-private partnership, encompassing a development, that allows a city or county to levy a special assessment against properties within the district to pay for public infrastructure improvements within the district – and others are included in the Platinum category.

Silver
- County issued certification that developers can use in marketing, and can be advertised on the County website
- Reduced parkland dedication fees
- Reduction in street pavement width requirements
- Pre-approved alternative surfacing for rural roads
- Unified reviews and inspections through interlocal development agreements

Gold
- Density bonuses
- Reduced or delayed review / permit fees for development review process
- Consider mitigation credits offered at a discounted rate

Platinum
- Performance incentive by means of Local Government Code Ch. 381 Agreements
- Public Improvement District (PID) funding
- County could facilitate with Hays County Appraisal District (HCAD) and assist Developer with 1-D-1 Open Space valuation
- County could purchase Conservation Easements (CEs) on dedicated open space
- County could assist with developing a land management plan and implementation for acreage under CE

NOTES ON INCENTIVES AND PIDS

The County could feasibly utilize the Texas Local Government Code Section 381 Economic Development Grant program ("381 Grants") as the umbrella mechanism to provide the desired incentive programs. Under this umbrella program, the County can provide specific policies to permit the use of other public financing mechanisms in addition to the 381 Grants.

It is recommended that the County adopt a policy under which it agrees to provide access to a menu of potential incentive programs based on the degree to which a proposed development achieves the County's desired objective of supporting conservation easements and conservation-based development.

The two most likely mechanisms suggested to be included in this policy would be:
Public Improvement Districts ("PIDs"); and,
Section 381 Economic Development Grants.

PIDs are an economic development tool created by the State of Texas in 1987 to permit cities and counties to facilitate the use of private investment capital to fund the costs of public improvements and infrastructure. Although not a true economic incentive in that it does not require a city or county to utilize any of its own funds to support the investment, it is a discretionary tool that cities and counties can agree to use to assist developers in lowering the cost of capital for their projects and providing a source of funding and reimbursement to the developers for eligible costs.

It is recommended that the County include the potential agreement to create and utilize PIDs in exchange for implementing desired conservation objectives. Based on a set of benefits to be determined, the County can create a set of ranking criteria to determine the amount of and type of PID benefits to be approved.

For example, the amount of PID financing which can be supported by a new development is usually limited to the total equivalent tax rate that a property owner would have inclusive of the PID and each of the other taxing jurisdictions (County, EDS, ISD, etc.). The typical property located in the County but not within the city limits of any town or city in the County, is approximately $1.67 per $100 of assessed value. A typical development in the Austin metropolitan area targets a total equivalent tax rate not to exceed $3.00 per $100 of assessed value. Effectively, the County can permit the developer to utilize up to $1.33 per $100 of assessed value to assist in the financing of its project.

It is suggested that the County ranks the desired benefits of its conservation easement and conservation development strategies and permit a developer to utilize the PID mechanism for what level of benefits it commits to provide from its project. If it commits to all the objectives, it can have a PID up to the maximum of $1.33. If it only achieves half of the objectives, its PID would be limited to $0.66, approximately 50% of $1.33. Specific objectives could have a specific amount of PID financing associated with the developer's commitment to achieve outlined conservation development standards.

In addition, it is not atypical for cities and counties in the development of their PID policies to require that a developer provide, from a separate source of funds, a direct payment to the jurisdiction for the jurisdiction's use for its desired objectives – affordable housing, infrastructure funding, creation of a seed fund for direct acquisition of real property, etc. It may be appropriate for the County to consider requiring a payment obligation, from non-PID funds, of as much as 10 percent of the net proceeds from the PID for the County's use.
381 Grants, on the other hand, offer the ability of the County to provide direct payments to the developer from the incremental tax revenues generated from the development of a Project. Similar in many ways to a Tax Increment Reinvestment Zone ("TIRZ"), which provides for a sharing of the incremental tax revenues generated by a project's development for the reimbursement of qualified costs incurred in the development of a project, the use of a 381 Grant provides the developer with additional economic benefits without placing any added tax burden on owners of property within the development. It should be noted that the use of 381 Grants does involve the County taking a portion of tax revenues it would otherwise have the use of for its operating needs and instead using them to reimburse the developer. However, it can also be assumed that, without the use of the 381 Grant, that there might not be any additional development at all and any associated increased tax revenues. The County will need to determine if the incremental benefits it receives after payment of a 381 Grant are greater than any costs it would need to incur on behalf of the project.

Because of the desirability from the perspective of a developer to receive funds from a 381 Grant, it is recommended that the County permit the use of a 381 Grant under limited circumstances such as when the benefits committed to by the developer are more than the desired benefits as stated by the County or for projects providing for economic development from commercial and mixed-use developments.

FINAL

IMPLEMENTATION AND PROCEDURES

There are several ways Hays County could implement a conservation design effort. For instance, as discussed earlier in this report, the planning team on the project considered a highly specific rewrite of Chapter 365 of the County's development rules, codifying in detail the application, review, and approval process. Instead, the team decided in favor of a more flexible approach, allowing both developers and the County to custom tailor agreements from a menu of best practices and incentives.

Given the limitations of county authority in Texas, the current development climate, the growth rate, the diverse geologic and cultural zones of the County, County staffing, and existing County customs, practices and expertise, the project's professional team recommends development agreements as the tool to implement conservation design. The team believes this approach provides the best opportunity for both parties to address the highly variable challenges of unique development sites across the diverse reaches of Hays County, fostering innovation and better incentivizing the use of conservation practices.

Under this recommended approach, the guidelines, goals, and incentives laid out in this report would become the foundation — a kind of catalyzing structure – for conservation development in the County. Final details and binding agreements would be worked out through highly individual development agreements. The public, landowners, developers, conservation advocates, and staff would all operate from the agreed set of goals and general incentive guidelines established in this report (or as amended and finally adopted by the Commissioners Court).

Conservation design would be an opt-in alternative that is permitted, and incentivized, under the rules. By working with the County through a legally-binding development agreement, developers would be eligible for substantial benefits under this opt-in approach, and at the same time would be responsible for developing in ways the County deems beneficial to the public, meeting standards that the County cannot require under existing state law. However, would-be developers could also submit under the County's standard rules, ensuring them "development certainty" and a traditional path forward.

The County can formalize this approach relatively easily and quickly by amending the current development rules to remove references to the specific criteria for conservation development and replacing that with a reference to this report and its guidelines – or a similar set of guidelines adopted by the County Commissioners Court. Included in the Appendix is a sample brochure to help explain how an application for conservation development might work, an application checklist, examples of successful conservation development from around the state and nation, examples of best practices for design, low impact development, and a non-binding set of notions from team member Randall Arendt on what developers and County officials might consider when preparing and reviewing applications, particularly if the process becomes more routinized over time.

For now, as noted earlier, the recommendation is for applications to be processed as part of a development agreement. The team recommends that:

1. Applicants begin by using the interactive scoring matrix prepared as part of this project to gauge whether they are interested, and whether their project might qualify. (The County would need to make the matrix readily available on the County website.)

2. Applicants meet with County development staff and their County Commissioner to discuss the project before preparing detailed planning and engineering documents.

3. The County uses the same matrix to judge whether the development might qualify for incentives, and what type of incentives.

4. If both parties agree that the conservation development option is viable, then they enter into negotiations for a development agreement.

The findings and recommendations in this report apply only to the unincorporated areas of Hays County. It is recommended, however, that in the future the County coordinate as much as possible with cities to create a clear “conservation path” for developments within extra territorial jurisdictions and even, perhaps, within corporate limits – especially in those incorporated municipalities that rely on the County for development review and enforcement.

In addition, the team recommends that in the future the County implement a similar program for prospective developments that do not meet the conservation design standards laid out here, but that might nonetheless have important conservation opportunities and whose developers might be willing to try the kind of context-sensitive, “greenway” design identified and detailed in the charrette sections of this report – development that might not be “true”

conservation design but would be greener and more oriented to conservation practices than “typical” subdivision development.

Finally, as noted elsewhere, it is important for this to be considered a “living document.” If adopted, the recommendations contained in this report will need to be reviewed and refined after the County staff has developed experience with the guidelines, and as development practices – and pressures – in the County continue to evolve.

APPENDIX

APPENDIX A
DEFINITIONS

Charette: A fancy French word for "planning exercise." A charrette, in this case a design charrette, is a type of integrated, participatory planning process in which major members of a multidisciplinary team – typically consisting of planners, architects, landscape architects, civil and transportation engineers, city officials, stakeholders, and more – come together to resolve various project issues and elements to finalize a development's design, site plan, and implementation plan.

Cluster Development: A residential cluster development, otherwise referred to as a context-sensitive subdivision throughout this report, is the close-knit grouping of residential properties on a development site so as to minimize the development footprint to make room for open space conservation land.

Concept Plan: A scaled illustrative drawing that shows the existing and proposed conditions for a given area of a property. It is used as a starting point to get a better idea of what could fit, and what could feasibly be accomplished on a development property.

Condo Regime: Unlike what generally comes to mind when someone thinks of "condos," in this context, a condo regime, or a horizontal condo regime, refers to one large platted lot that contains multiple dwelling units. Residents can own the homes but not the land.

Ecologically Sensitive Area: A type of designation for a natural area which needs special protection because of its landscape, finite resources, wildlife habitat or historical value.

Evapotranspiration: The sum of water evaporation and transpiration from a surface area to the atmosphere. Evaporation accounts for the movement of water to the air from sources such as the soil, canopy interception, and water bodies.

Exfiltration: Refers to a loss of water from a drainage system as the result of percolation or absorption into the surrounding soil. When performing a reach routing, a constant exfiltration (CFS) can be subtracted from the inflow hydrograph to account for these losses.

Extraterritorial Jurisdiction (ETJ): Extraterritorial jurisdiction is the legal ability of a government to exercise authority beyond its normal boundaries. Any authority can claim ETJ over any external territory they wish.

Floodplain: A generally flat or low-lying area adjacent to a waterway that is prone to flooding.

Impervious Cover: A surface, typically man-made, that cannot effectively absorb rainfall that is prone to flooding.

Infiltration: The process by which water on the ground surface enters the soil. It is commonly used in both hydrology and soil sciences.

Interlocal Agreements: a collaborative contract between public bodies aiming to provide more efficient, less costly public services.

Green Infrastructure: Green infrastructure is an approach to water management that protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical, and enhances community safety and quality of life. It means planting trees and restoring wetlands, rather than building a costly new water treatment plant.

Karst Topography: A landscape that is characterized by numerous caves, sinkholes, fissures, and underground streams

Low Impact Design (LID): A land planning and engineering design approach to manage stormwater runoff as part of green infrastructure. LID emphasizes conservation and use of on-site natural features to protect water quality.

Platted Lot: When a property is surveyed, subdivided, and its boundaries and existing conditions are recorded through and formally recognized by the local jurisdiction. Units in a condo regime are considered lots and must be platted under county rules.

Porous Pavement: Permeable paving surfaces are made of either a porous material that enables stormwater to flow through it or nonporous blocks spaced so that water can flow between the gaps. Permeable paving can also include a variety of surfacing techniques for roads, parking lots, and pedestrian walkways.

Riparian Vegetation: Vegetation found along river networks and the banks of water bodies

Recharge Features: A recharge feature is a natural or artificial feature either on or beneath the ground surface that provides or creates a significant hydrologic connection (or pathway) between the ground surface and the underlying groundwater within an aquifer.

Right-of-Way (ROW): A type of easement granted or reserved over the land for transportation purposes such as a highway or public footpath as well as utility lines, such as electric transmission lines or gas pipelines

Runoff: The flow of water occurring on the ground surface when excess rainwater, stormwater, meltwater, or other sources, can no longer sufficiently rapidly infiltrate in the soil.

SH 45 Agreements: Interlocal agreements between the County and other entities, such as towns, along the SH 45 corridor

Smart Growth Strategies/Practices: An overall approach to development that encourages a mix of building types and uses, diverse housing and transportation options, development within existing neighborhoods, and robust community engagement.

Xeriscaping: Xeriscaping is the process of landscaping, or gardening, that reduces or eliminates the need for irrigation.

APPENDIX B

DESIGN ELEMENTS FOR GREENER NEIGHBORHOODS

A primary goal for conservation subdivisions is creating livable, saleable neighborhoods, interspersed with functional open space to improve the quality-of-life of the new residents and to boost sales velocity.

The various design elements mentioned below describe and illustrate a number of layout design ideas recommended for greener neighborhoods located in areas with public water and sewer in suburban Hays County.

1. "Attached Greens"

An "attached green" is one where a row of house lots (or townhouses) abuts the greenspace directly, with the street located at the far edge of the green (and garage access provided via rear lanes running along the back lot lines). It is a useful design approach, particularly along busy streets. This orientation greatly enhances the livability of homes, whose residents step directly from their front porches right onto the greens.
The two images below are from Westwood Common in Beverly Hills, MI.

The below examples of "attached greens" with multi-family housing are at Weatherstone in Chester County, PA. This design approach saves on street pavement costs and reduces impervious coverage.

2. Back Lane Alleys for Rear Garage Access

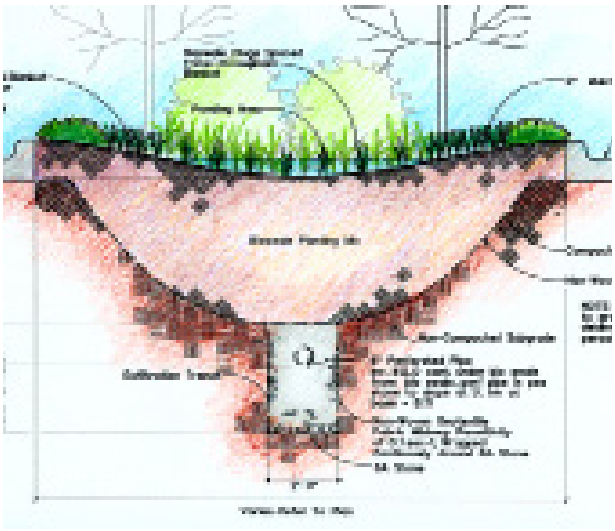
Back lanes are alternative design features to front-facing garages that dominate streetscapes, especially for lots less than 60 feet wide, or that have a detached (duplex) home with two-car garages. When such lanes are provided, they should be planted with shade trees, just the same as the streets in front Rear access can take the form of private common drives or lanes, maintained by HOAs. That approach also makes it easier to design them without the excessive paved widths that are often required by municipalities.

3. Bioretention Cells

A bioretention facility functions as a soil and plant-based filtration device that removes pollutants from stormwater runoff through a variety of physical, biological, and chemical treatment processes. These facilities normally consist

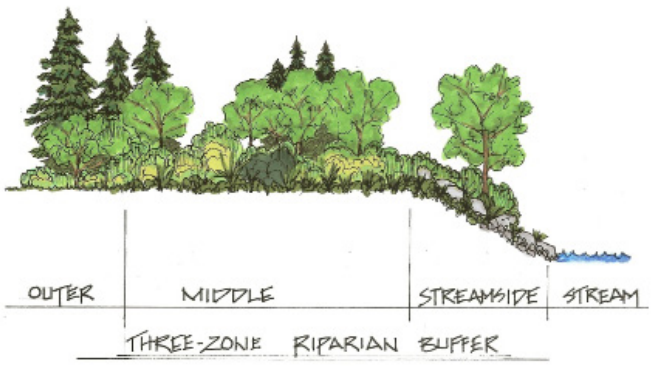
of a grass buffer strip, sand bed, ponding area, organic or mulch layer, planting soil, and plants. The runoff velocity is reduced by passing over the grass buffer strip and subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

4. Bioswales



Bioswales are stormwater runoff conveyance systems that provide an alternative to storm sewers while also treating the stormwater and improving water quality. They can absorb low flows or carry runoff from heavy rains to storm sewer inlets or directly to surface waters. Bioswales improve water quality by infiltrating the first flush of stormwater runoff and filtering the large storm flows they convey. The majority of annual precipitation comes from frequent, small rain events Much of the value of bioswales comes from infiltrating and filtering nearly all of this runoff.

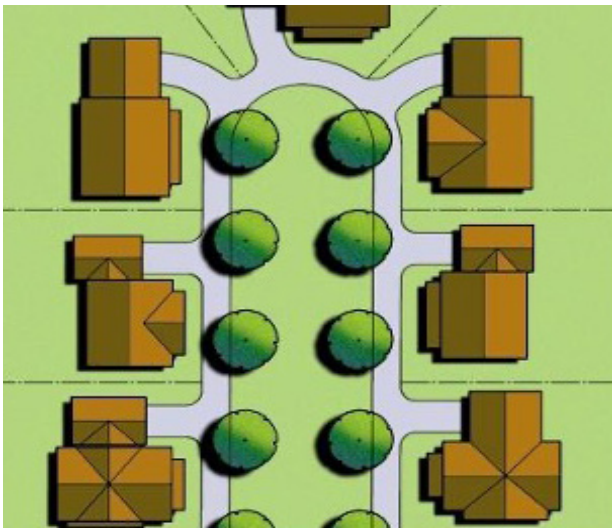
5. Buffer Zones



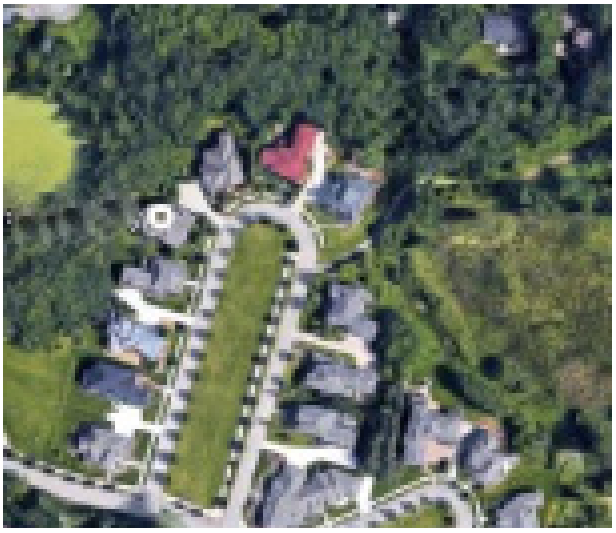
A riparian buffer is a permanent area of trees and shrubs located adjacent to streams, lakes, ponds, and wetlands. Riparian forests are the most beneficial type of buffer since they provide ecological and water quality benefits. Restoration of this ecologically sensitive habitat is a responsive action to past activities that may have eliminated any vegetation such as development or agriculture.

6. "Closes"

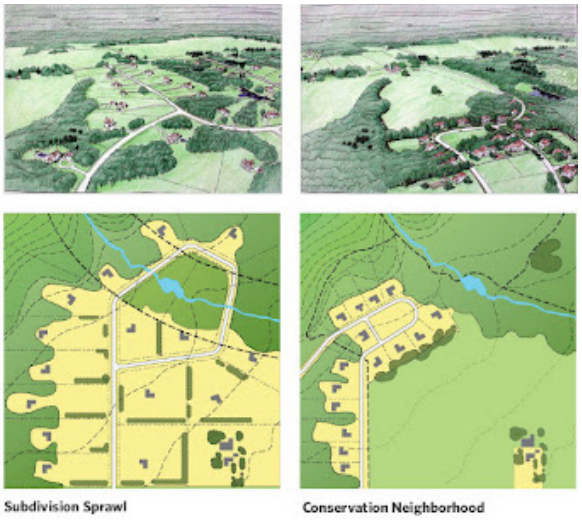
As an alternative to the standard cul-de-sac, a “close” consists of a one-way street looping around a small central green. The turning radius at the far end is designed to meet engineering standards for turning movements required by long vehicles, such as fire trucks and moving vans. Sometimes the central green area can be used as a rain garden, where stormwater pools for a few days before being absorbed by the soil. In this case, the encircling street should be sloped inward toward the green. Although most “closes” occur singly, they are occasionally paired as in the unusual end-to-end example on the right below, from Berthoud Co., CO.



Another pair of closes, from Minnetonka, MN, below, is arranged side by side. As greener, value-adding alternatives, “closes” can entirely replace conventional cul-de-sacs in more progressive layouts.



7. Conservation Design



Conservation design requires careful attention to site planning to delineate areas to be protected as open space and areas to be developed as home sites. Ideally, a conservation design will identify unique, scenic, and significant natural features of a site to be preserved in large contiguous blocks. Homes and lots are then laid out to maximize visual and physical access to the open space by the residents. Homes are clustered together on smaller lots, usually in a few areas of the site to maximize each resident's access to the open space. The combined effect of the protected open space and the clustered homes results in an average overall density no greater than the density achieved using a conventional subdivision design. An easement or other mechanism for preserving the open space ensures that the open space will not be developed.

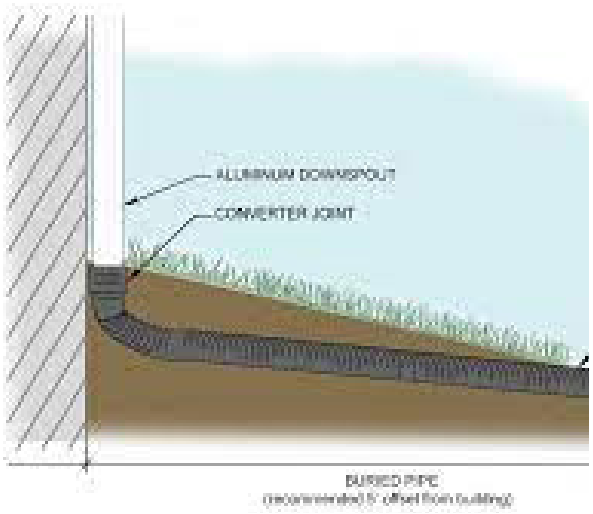
8. Constructed Wetlands

Constructed wetlands are structural practices that incorporate wetland plants in a shallow pool. As stormwater runoff flows through the wetland, pollutant removal is achieved by settling and biological uptake within the practice. Wetlands are among the most effective stormwater practices in terms of pollutant removal, and also offer aesthetic value. While natural wetlands can sometimes be used to treat stormwater runoff that has been properly pretreated, stormwater wetlands are fundamentally different from natural wetland systems. Stormwater wetlands are designed specifically for the purpose of treating stormwater runoff, and typically have less biodiversity than natural wetlands both in terms of plant and animal life. There are several design variations of the stormwater wetland, each design differing in the relative amounts of shallow and deep water, and dry storage above the wetland.

9. Cul-de-sac Islands

If cul-de-sacs cannot be avoided, they can be easily designed with pear-shaped Islands at their ends, which should be planted with shade trees providing colorful autumn foliage or lovely spring blooms. They also punctuate the very large open area that all cul-de-sacs create, adding great beauty and value to the neighborhood

10. Disconnected Imperviousness



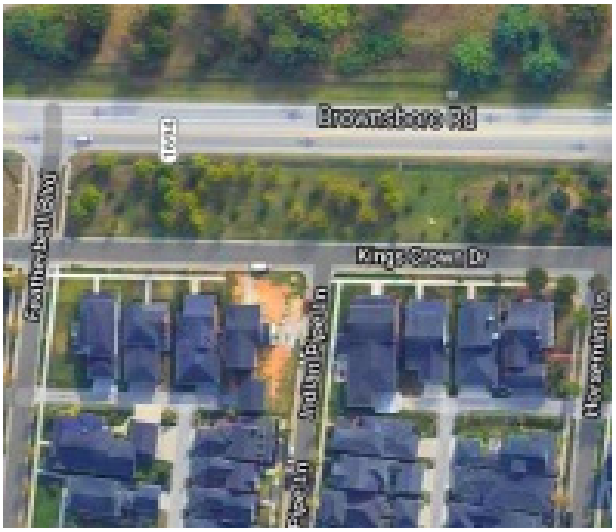
Runoff from connected impervious surfaces commonly flows directly to a stormwater collection system with no possibility for infiltration into the soil. For example, roofs and sidewalks commonly drain onto roads, and the runoff is conveyed by the roadway curb and gutter to the nearest storm inlet. Runoff from numerous impervious drainage areas may converge, combining their volumes, peak runoff rates, and pollutant loads. Disconnection decouples roof leaders, roadways and other impervious areas from stormwater conveyance systems, allowing runoff to be collected and managed on site or dispersed into the landscape. Runoff is redirected onto pervious surfaces such as vegetated areas, reducing the amount of directly connected impervious area and potentially reducing the runoff volume and filtering out pollutants. Routing runoff to vegetated areas will reduce the peak discharge and stormwater volume by providing an opportunity for infiltration and evapotranspiration. Pollutant load from impervious areas is a product of pollutant concentration and the stormwater volume. Disconnection practices decrease the total volume of stormwater discharged to receiving water bodies, resulting in reduction in pollutant and nutrient loading.

11. Filter Strips

Filter strips are vegetated areas that are intended to treat sheet flow from adjacent impervious areas. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and providing some infiltration into underlying soils.

11. "Foreground Meadows"

Many roadside parcels can be developed with an attractive side facing the main public road, and with homes pulled back from it to reduce negative effects of traffic noise, etc. The park-like open space that is thereby created can be planted with a variety of deciduous and coniferous trees. This area buffers homes from the busy road running along the front of the property and provides greater livability. It also presents the traditional front facades to the public street, instead of lining it with backyards or fences.



On the left, above, is a conventional layout with houses backing up to the pre-existing public street. On the right is an aerial view of Norton Common in Louisville, presenting itself to the passing public across a linear greenspace parallel to Brownsboro Road. Note also that the street running directly in front of these homes could have been eliminated because their garages are accessed from back lanes. That arrangement would be similar to the "attached green" concept also described and illustrated in this report.

12. Garage Orientation

When lots are less than 60 feet wide, builders often locate garages as appendages to the house fronts, with the result that protruding garages doors become a central feature of the street facades, dominating the streetscape and defining the neighborhood in a distinctly non-traditional way. A far better alternative is to recess front-loaded garages, OR to provide rear lanes or alleys.

These streetscapes look so appealing in large part because the homes on these efficient, narrow lots are not dominated by garage doors fronting onto the street. Rear access to the garages can take the form of private common drives or "back lanes", maintained by HOAs. The photos are from Baxter at Fort Mill, in SC (a Charlotte suburb).

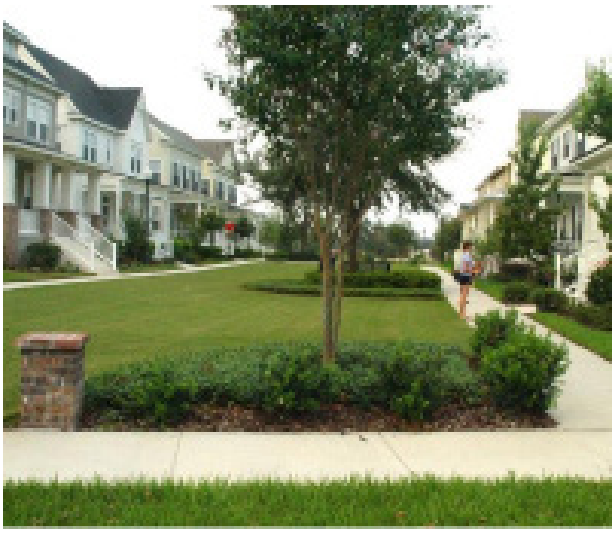
13. Green Roofs

A green roof cover is a veneer of vegetation that is grown on and covers an otherwise conventional flat or pitched roof (30° slope), endowing the roof with hydrologic characteristics that more closely match surface vegetation than the roof. The overall thickness of the veneer may range from 2 to 6 inches and may contain multiple layers, consisting of waterproofing, synthetic insulation, non-soil engineered growth media, fabrics, and synthetic components. Green roof covers can be optimized to achieve water quantity and water quality benefits. Through the appropriate selection of materials, even thin vegetated covers can provide significant rainfall retention and detention functions. Vegetated roof covers that are 10 inches, or deeper, are referred to as 'intensive' vegetated roof covers. Intensive assemblies can also provide substantial environmental benefits, but are intended primarily to achieve aesthetic and architectural objectives.

14. "Greenway Streets”

When garages are located in the back, accessed by rear lanes, opportunities exist for eliminating the street that traditionally runs in front of houses. In this example, the street area has been landscaped as a green space, with sidewalks on both sides for pedestrians. In a street grid pattern, these streets would be located in lieu of minor cross-streets and could be repeated in line across a number of blocks to form a greenway spanning an entire neighborhood, perhaps linking homes with a larger part, shops, or a school. This design approach can be used in neighborhoods of single-family detached homes (Baldwin Park I Orlando, left), or in ones involving attached housing, such as condominium units or apartment. “Greenway streets” can be extended across many blocks, creating continuous walkways safely connecting neighborhoods with parks, schools, shops, etc., as in Laureate Park in Orlando, below left. This design technique costs developers nothing – in fact it can save them money. While a sidewalk down the middle might seem obvious, it does not create the

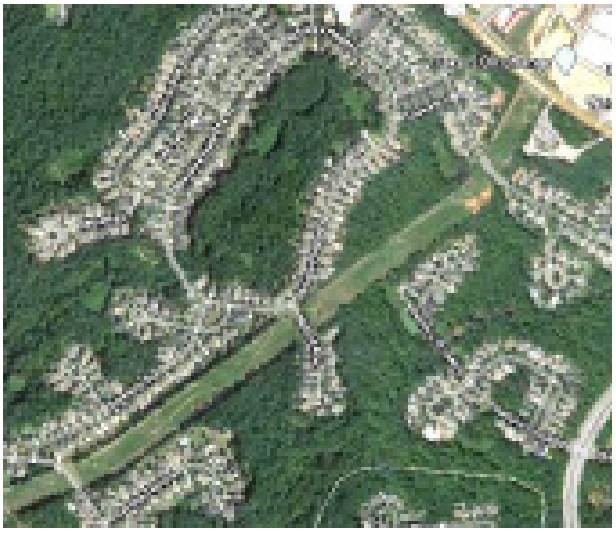
same parklike atmosphere as do two sidewalks bordering a central green.

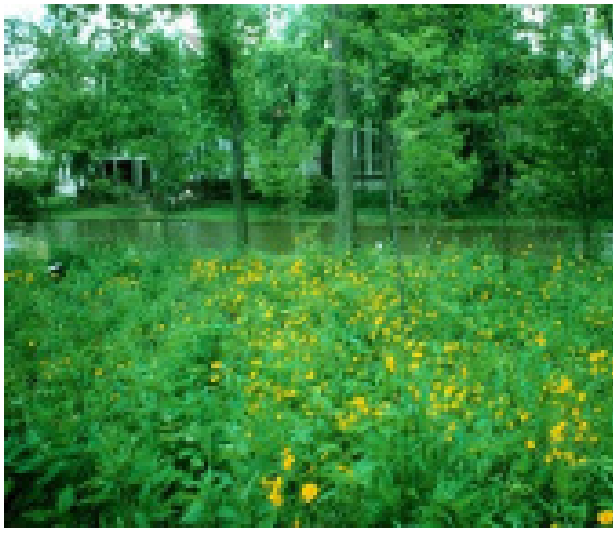


The exception – above right – is when the distance between opposing house fronts is about 20-25 feet, creating a "mews" effect. The developer of this neighborhood in Aurora IL calls them "kids' streets".

15. Homes backing up to Open Space

To the greatest extent that is achievable, house lots in greener neighborhoods are designed to back up to open space, enhancing the livability of the homes. This complements the strategy of facing other homes onto neighborhood greens. Left below is Baxter at Fort Mill SC, where much of the natural open space consists of woodlands that are either steep or wet. At right is Harbortown in Memphis, where these lots backup to wet detention ponds located in a linear park. Homes on such lots typically have front-facing garages (and no alleys to block views of the open space behind the homes).





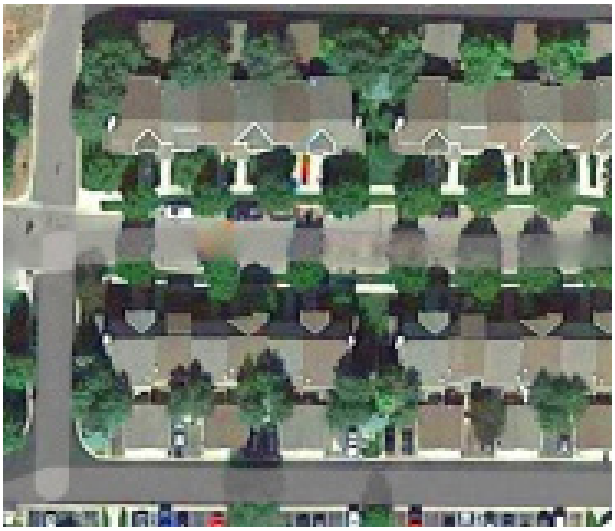
16. Mid-Block Connections

Footpaths and sidewalks should provide ways for pedestrians to cut across long blocks midway between street intersections. On the left is such a connection in a conventional subdivision. On the right is another from Seaside, FL.

17. Multi-Family or Attached Housing

The otherwise attractive residential units shown below left are almost totally hidden behind their garages. This kind of elevation is more appropriate to an alley or back lane than it is to a public street. Similar densities were achieved in the parallel photo (below right, from Baxter at Fort Mill,, SC) in a far more appealing way, with front porches, shade trees and sidewalks.

Equally attractive results can be achieved with contemporary design, as shown below from Eagle CO where these three-family homes present their fronts to the street and their garages to rear lanes behind them. The cost of providing the rear lane is similar to the cost of providing surface parking areas in conventional developments.



18. Multiple Small Neighborhood Greens

Many properties lend themselves very well to the concept of creating separate but related “outdoor rooms'', defined by central open space. The special new neighborhood on the right offers a variety of greenspaces missing from the standard subdivision on the left, such as a central green (visible from streets) and an informal playing field (behind another group of homes).

19. Natural Channel Design

Natural channel design addresses the entire stream system including its biological and chemical attributes. It is based on fluvial geomorphology, which is the study of a stream's interactions with the local climate, geology, topography, vegetation, and land use. The underlying concept of natural channel design is to stabilize impaired stream reaches by considering channel form and function in conjunction with "soft" engineering treatments, as opposed to traditional "hard" engineering that often ignores channel function. Reference reaches, empirical relationships, and analytical models can be useful in deriving the appropriate channel dimension, pattern and profile. Successful natural channel designs achieve sediment transport, habitat enhancement, and bank and channel stabilization. Ultimately, a stream considered stable or "in equilibrium" will carry the sediment load supplied by the watershed without changing its dimension, pattern, or profile, and without aggrading or degrading.

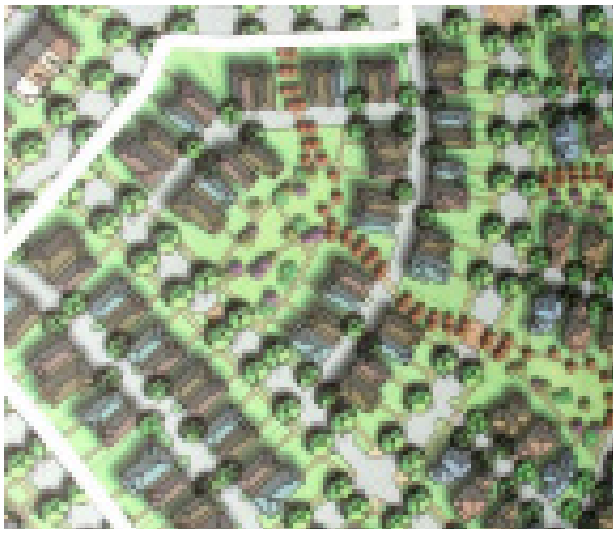
20. Pedestrian Connections

Footpaths can provide convenient ways for pedestrians to walk between streets and cul-de-sacs, and can be either paved or unpaved, fenced or unfenced.

21. Pocket neighborhoods

Sometimes called Bungalow Courts, this development type can easily achieve densities of 10 du/ac with single-family detached housing. Their grouping around a central green makes them distinctive, and very attractive to many homebuyers. They are usually built in small groups of 10-14 homes. The below examples are Conover Common and Danielson Grove, both located in the Seattle suburbs.

Pocket neighborhoods can either stand alone or be nested within traditional neighborhoods, with the back lanes which serve them also serving larger homes facing in the opposite direction, fronting onto the development's street network, as shown in the below design for Black Diamond, WA.



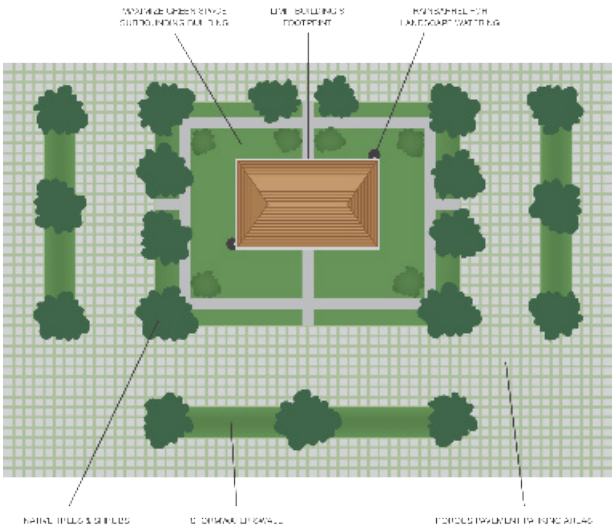
22. Porous Pavement

Porous pavement is a permeable pavement surface with a stone reservoir underneath. The reservoir temporarily stores surface runoff before infiltrating it into the subsoil. Runoff is thereby infiltrated directly into the soil and receives some water quality treatment. Porous pavement often appears the same as traditional asphalt or concrete but is manufactured without "fine" materials, and instead incorporates void spaces that allow for infiltration.

23. Rain Gardens

Provision should be made for the creation of "rain gardens" within parks and the greenspace bounded by the neighborhood greens. These engineering features allow the first flush of runoff from most storms to infiltrate directly into the ground, irrigating the trees and other park vegetation, and also replenishing the aquifer. These design elements work best when the street pavement is sloped towards the greenspace. When curbing is used, it is typically punctuated by small openings to allow runoff to enter the rain gardens.

24. Reduced Imperviousness



Reducing impervious areas such as street and parking areas performs valuable stormwater functions, in contrast to conventional or baseline development. Some of these functions are increasing infiltration, decreasing stormwater runoff volume, increasing stormwater time of concentration, improving water quality by decreasing the pollutant loading of streams, improving natural habitats by decreasing the deleterious effects of stormwater runoff and

decreasing the concentration and energy of stormwater. Imperviousness greatly influences stormwater runoff volume and quality by facilitating the rapid transport of stormwater and collecting pollutants from atmospheric deposition, automobile leaks, and additional sources. Increased imperviousness alters an area's hydrology, habitat structure, and water quality. Stream degradation has been witnessed at impervious levels as low as 10-20% (Center for Watershed Protection, 1995).deposition, automobile leaks, and additional sources. Increased imperviousness alters an area's hydrology, habitat structure, and water quality. Stream degradation has been witnessed at impervious levels as low as 10-20% (Center for Watershed Protection, 1995).

25. Semi-Detached Homes

The residential appearance of two-family homes is not unduly impacted by single-car garages facing the street (below left), but wider two-car garages dominate the facade (below right) and should be accessed from rear lanes or alleys, as shown in the third and fourth photos.

26. Shade Trees

It cannot be emphasized enough how very important shade tree planting is along neighborhood streets. Shade trees should be planted at 40-foot intervals on both sides of every street, between the curb and the sidewalk, in tree-lawns at least six feet wide. If they are not required at the outset, they are seldom planted afterwards, and almost never in any consistent manner.

27. Side Entry Garages

On lots between 60-90 feet wide, the fronts of houses can be designed to minimize the appearance of garage doors by facing the garage sideways toward the street, thereby maximizing the visual appeal of homes. At left is a house on Prince Edward Island. AT right is a Toll Brothers house with a three-car garage in McKinney TX

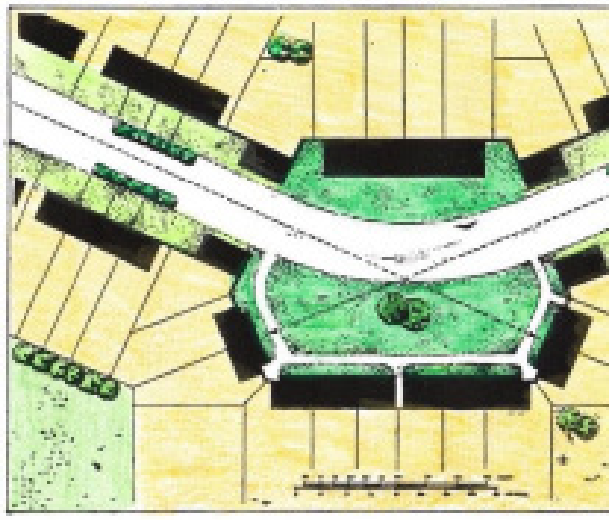
28. Soil Amendments

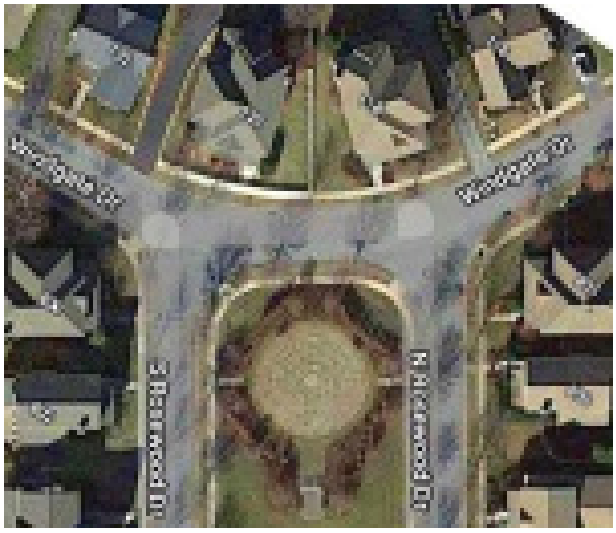
Soil additives, or amendments, can be used to minimize development impacts on native soils by restoring their infiltration capacity and chemical characteristics. After soils have been amended their improved physical, biological and hydrological characteristics will make them more effective agents of stormwater management

29. "Terminal Vistas"

Greenspace is deliberately positioned either at the ends of streets, or along the outside edge of curving streets, so that the visibility of these amenities will be maximized. The first two photos are from Harbortown in Memphis. The third is from Weatherstone in Chester County PA. The fourth is from McConnell at Davison in Davidson NC.

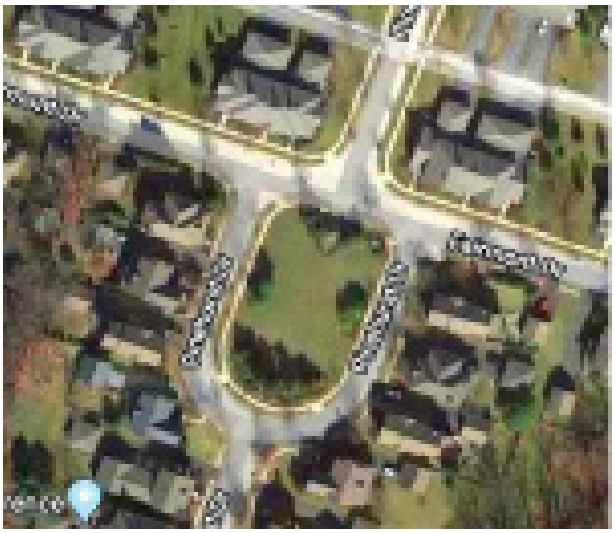
The two examples below show how street curves can be combined with neighborhood greens to maximize their visual impact. The drawing is from Raymond Unwin's Town Planning in Practice (1908); the photo is from Weatherstone in Chester County, PA

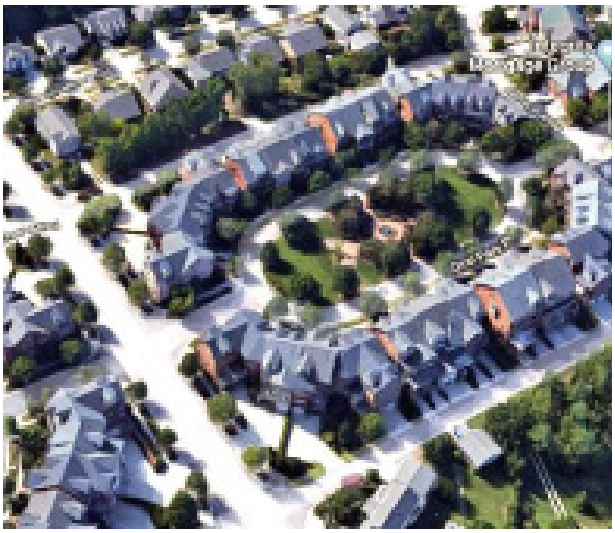




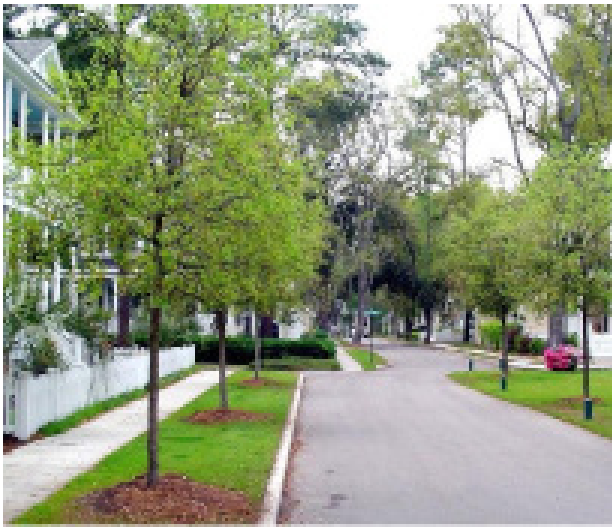
30. Traffic-Calming

To improve pedestrian safety, vehicular speed can be slowed by a number of creative site design techniques. On the left is a neighborhood green that deliberately interrupts traffic flow, causing vehicles to slow down. At right is an oval neighborhood green surrounded by high-density attached housing in Meadowmont, in Chapel Hill, NC.





Below is a "deliberately cranky street" at Habersham in Beaufort SC. At right are a series of such streets, some ending in "T" intersections. Note how difficult it is for vehicles to race through this neighborhood.



31. Tree Boxes

Tree Box filters are very small bioretention areas installed beneath trees that can be very effective at controlling runoff, especially when distributed throughout the site. Runoff is directed to the tree box, where it is cleaned by vegetation and soil before entering a catch basin. The runoff collected in tree boxes effectively irrigates the trees. The system consists of a container filled with a soil mixture, a mulch layer, under-drain system, and a tree or shrub. Stormwater runoff drains directly from impervious surfaces through a filter media. Treated water flows out of the system through an underdrain connected to a storm drainpipe/inlet or into the surrounding soil. Tree box filters can also be used to control runoff volumes/flows by adding storage volume beneath the filter box with an output control device. Typical landscape plants (shrubs, ornamental grasses, trees and flowers) are used as a integral part of the bioretention/filtration system. They can fit into any landscape scheme increasing the quality of life in urban areas by adding beauty, habitat value, and reducing the effect of urban heat islands.

32. Tree Preservation

Desirable trees are preserved and protected from damage during project development. Tree preservation offers the following benefits: stabilize the soil and prevent erosion; reduce stormwater runoff by intercepting rainfall, promoting infiltration, and lowering the water table through transpiration; moderate temperature changes, promote shade, and reduce the force of wind; provide buffers and screens against noise and visual disturbances, thus providing a degree of privacy; filter pollutants and remove carbon dioxide from the air and produce oxygen; provide a habitat for animals and birds, and increase property values and improve site aesthetics.

APPENDIX C
COMMUNITY OUTREACH

C1. STAKEHOLDER SURVEY COMMENTS

We welcomed any additional thoughts or comments stakeholders had about how Hays County should – or should not – address conservation development and innovative design standards for subdivisions, or any suggestions about the incentives to encourage builders to opt for more environmentally friendly construction and development patterns in Hays County.

- *Conservation should be a priority set and led by local governing bodies. It's unfair to expect developers to absorb all the added expense of developing responsibly. The county and municipalities when in their ETJ's, need to create opportunities that minimize expense and reward projects that focus on conservation.*
- *Revise plumbing code to support greywater reuse.*
- *Please restrict development over the Edwards Aquifer Recharge Zone.*
- *Encourage fire safe building and landscape design/maintenance. Provide suggestions to encourage native plants for landscaping and to discourage/control exotic invasive species. Also discourage feeding of deer, which concentrates them in unnatural, unsustainable fashion and causes environmental damage.*
- *Environmental friendly construction and development is vitally necessary to protect our communities.*
- *Regarding barriers to conservation developments, I believe there is a perceived belief about the market from developers and homebuilders that is wrong. Going to need to change the status quo in development and home design, which is a barrier. Production home builders need to rethink how to build for conservation – larger roof overhangs, covered porches, roofing and gutters and inclusion of rain tanks in every home design. Rethink the "yard" or outdoor space. Example: Homes in La Cima do not represent the type of building and landscape for a conservation development. We need to clearly define the attributes and benefits of conservation design and build a marketing program around that as the*

most desirable way to live in the Hill Country. WE do not have a good example of true conservation development in Hill County, of which I'm aware – LID cluster development with decentralized wastewater treatment, rainwater harvesting as norm, and lots of open space, maybe trails, for enjoyment of the natural world. See TWDB study (2011?) on rainwater harvesting development. (Rivers System Institute, now Meadows Center, TSU/Venhuizen)

- *Hays County should incentivize conservation development*
- *This type of development is critical for the future. Make hay's county stand out for this to make up for a lot of damaging subdivisions already in existence . This type of conservation requirements or restrictions will not impede development because people do want to live here and more conservation land in the forms of parks and green spaces will only increase the desirability. Hays county needs to be concerned about its water supply and natural resources to avoid the problems already occurring in similar areas north of austin which are already experiencing aquifer problems including contamination, over pumping and substandard development*
- *I'd like to see more attention paid to the protection of contiguous open space rather than just pockets—that is, wildlife corridors and bridges between open spaces for wildlife.*
- *I am hopeful Hays County will become a regional leader in sustainable development. Kudos for your efforts!*
- *Rain water harvesting isn't to supplement drinking water - it's to supplement or replace water that ISN'T for drinking - ie showering, toilets, laundry, etc.*
- *It is a delicate balance between protecting and enhancing conservation values and the ecosystem benefits they provide against increasing demand for development and the push of demographics. This is not, however, an "either/or '' but rather a "both/and". Developers should be incentivized to protect open spaces, provide for watershed and aquifer recharge, and provide multimodal transportation options. Cluster housing permitting is essential. The County would recapture such incentives through the economic benefit of functioning ecosystem services. Developers would profit by having a far more attractive product for buyers. Hays County is pushing up to a hard decision point: will it grow, prosper, and act as an example for thoughtful, balanced planning, or simply default to a faceless, disconnected series of suburban developments and suffer the costly consequences of an irremediably broken ecosystem?*
- *Terry Mitchell tmitchell@momarkdevelopment.com*
- *none at this time*
- *Maintain mature trees. Long term trail planning with an interconnected system of trails and park. Dark sky priorities. Setbacks to preserve view corridors. Requirements that developers financially contribute to water, sewer, roads, trails and parks infrastructure*
- *https://www.conservationgateway.org/ConservationByGeography/*

NorthAmerica/Pages/mitigation-principles.aspx

- *For a development to be called a conservation development it should be restricted to less than 10% impervious cover, required to use rainwater harvesting as the primary water source and decentralized wastewater treatment systems. Primary and secondary conservation areas should be prohibited from development and critical aquifer recharge zones should be off limit to development and road and drainage standards should be designed to reduce roadway width and require green infrastructure BMPs equal to or greater than defined in the https://bseacd.org/uploads/Final-RWQPP-VOL-I-2005-06-20.pdf. Site plans should cluster development on ideally 6%-10% of the site and the open space that is conserved should have a conservation easement placed on it and could be incentified by purchase of development rights and protection of key environmental features like wildlife habitat, aquifer recharge, riparian zones and steep slopes, hill tops and important scenic vistas including set backs off roads to preserve viewsheds. The use of public bonds to allow for developers to be incentified to design and build green infrastructure and adhere to the design principles the consultants ultimately develop will be vital for protecting beauty and ecological functioning, especially of our water and wildlife and endangered species in Hays County and the Hill Country. Conservation Development should become the norm not the exception. In Western Hays County, Conservation Development should be the only kind of development allowed in the future, especially in the Jacob's Well GMZ and the Blanco Regional Recharge study zone. No groundwater pumping should be allowed for a development to be called a conservation development and to receive the incentives of a PIP or MUD they should be required to use the principles of One Water, decentralized green infrastructure. I don't think this survey is very comprehensive and I hope there will be a chance for more feedback and engagement of a broader and more diverse set of local stakeholders. Having said that, I do appreciate this project team's efforts and the County Commissioners Court for forwarding this effort. Thank you*
- *In addition to rainwater harvesting, include rainwater best management practices, such as rain gardens, bioswales, etc. for stormwater runoff retention and flood prevention.*
- *Clear criteria/guidelines with administrative discretion*
- *All my 'yes' answers mean "Heck yes!" Hays and a very few other counties in Texas have been crawling toward a 21st century development regulatory environment slowly but surely. This is the best chance we've had to get it done in Hays. thanks!*
- *Strict laws and regulations on developers. Don't pay them with incentives to come here!*
- *This is a no brainer. Conservation development is a win-win. Developers still make their desired profit and the beautiful Hill Country is preserved. The large lot concept currently employed in Hays County is detrimental to the natural landscape because it does not allow for wildlife corridors and*

preservation of natural growth. Cluster development and wildlife corridors are the key to sustainable, unique, beautiful and marketable developments. It is critical to make the Hays County Habitat Conservation Plan the nucleus of this strategy. Conservation development has been around for a couple of decades and is the way we should be developing for a sustainable world. Given the explosive growth in the Austin-San Antonio corridor, it is the only way to preserve the character of the hill country.

- *This is addressed in the Hays County HCP. Referencing this document will help with education to landowners, developers and the public.*
- *There should also be incentives to encourage current property owners/ developers to regenerate their land to native habitat/ecosystems.*
- *I know conservation development is going to be a hot topic, but when it comes to water quality and quantity in Hays and surrounding areas, it is imperative to save and redesign existing undeveloped land.*
- *Using all tools available to conserve (Transfer of Development Rights, Conservation Easements, etc) is a start. I would like to see a funding source to help landowners and encourage new property owners/developments to regenerate the land to native prairie/ecosystem habitat.*
- *Educating the public and developers on both of these topics will be the key to success.*
- *This is addressed in the Hays County HCP. The HCP should be referenced during this process.*
- *The air quality is poor in some areas of the county near industrial plants (TSU, cement plants, etc). Air quality would affect rainwater quality. If the collected rain water is to be considered as drinking water, it would need to be tested for mercury, lead etc.*
- *Question 3 was not a fair question. NONE of the answers were what I would have picked but I had to pick one to move on. Add an "NONE' option or a less biased answer. This is unfair.*
- *Money talks. Financial incentives are often necessary to jump start changes (wind & solar energy)*
- *I favor building homes on a clustered, small footprint, surrounded by protected open, natural space. This benefits the involved homeowners, as well as everyone in the area.*
- *Air Quality is poor in some areas of the county especially near industrial plants (TSU, various cement plants, etc) which affects the quality of the rainwater. It would need to be tested for mercury, lead, etc before considering use for drinking water. Thank you.*
- *Make transfer of development rights available to landowners.*
- *Remember that sprawl creates traffic and over-reliance on automobile use. The open space in these developments doesn't change that. This should be integrated with an anti-sprawl mindset, e.g., making transit and walkability viable.*
- *Recommend making Transfer of Development Rights (TDR) available to landowners so that development and conservation can be directed while*

landowners still compensated.

- *San Marcos has strict flooding rules to keep a new building from causing ANY rise in water on neighbors. This is stricter than FEMA but very important in an area with such severe flash floods. Also 2 D modeling needs to be done on developments that have floodplains to be sure that flooding problems are not made worse by locations of buildings and pavement etc.*
- *Developers/builders earn by protecting and placing land under conservation easement. Cluster homes in the heart of open spaces, leaving most acreage as conservation areas. Homeowners live in nature without the maintenance.Require any home landscaping to be native species only.*
- *Example: 100 acres of land: 80-90 acres is open space conservation easement. 10-20 homes built in a cluster. Developer/builder has fewer construction costs i.e. roads, etc. Environmentally, it minimizes impervious cover, habitat destruction. Residents pay to live in nature without acreage to maintain and they like doing right by nature, living an conservation lifestyle. win win win*
- *Stricter regulations on soil protection during development is needed. During construction of many developments, existing soil is highly compacted to the point it becomes 'impervious cover' not unlike concrete even with a thin layer of topsoil and turf grass. The result is less recharge, increased runoff, and reduced water quality when over the recharge zone. Limitations on impervious cover is important, but limitations on soil compaction and/or area disturbed during development, I feel is equally important.*
- *Conservation development is a superior ethic to ordinary subdivision planning, but the problem for our area is the hydrogeology. We need more robust and refined groundwater modeling and to use it in a regulatory fashion to direct development that allows for growth but preserves the Hill Country--water, landscape, and wildlife. Rainwater, reuse, and zero discharge mean going above and beyond TCEQ standards and Randall Arendt's laudable principles.*
- *Incentives for xeriscaping as well.*
- *No additional comments*
- *Classic example is the Todd tract 150 acre tract broken up sold as small farms a few lots to single home lots way back in the 50s in Kyle. With differing opinions some want to change it for personal gain over others. Was this an attempt way back then to deter a highway as he saw I35 coming through closeby. Each tract helped each other. A great example of land conservancy way back then.*
- *Not one certified organic farm designed in any large subdivision or saved.*
- *Lights down, signs low and buffer zones up*
- *perhaps a special tax designation. Maybe no property taxes during construction and then a special, lower tax rate for homeowners post construction, similar to how some cities tax historic homes at less. It would be good to have the other tax authorities on board as well given that the County portion is so small.*

- *Developers could be required to build this way, as they are in other parts of the country. Individual land owners should not be required to use rainwater collection, but developments could be designed with open space that does not need irrigation. Limits could be put in place for water usage outside of the property owners.*
- *Call me for additional comments John Jones 512-632-3337 The Preserve at Driftwood Restrictions*
- *Incentivizing developers to employ these practices is worthwhile, though not across the entire Hays County. For example, downtown districts will need density and likely make use of city parkland instead of building it into the development. Perhaps tie the incentives to a particular set of zoning or away from certain districts where density is needed and encouraged and existing, set-aside land already exists. I'm imagining the conservation requirements will be different depending on the differing zoning types already. Thank y'all!*
- *Prevent commercial water pirates from tapping into the aquifer to sell the water underneath our lands.*
- *Do not allow treated effluent to be disposed of in creeks or other waterways. Require rainwater collection for new construction and offer incentives for existing well owners to convert to rainwater collection. Also incentives for solar panel installations.*
- *Protecting undevelopable land, such as floodplain or too steep, shouldn't count towards credits. Protected resources should be planned the same way roads are planned for future connections.*
- *Hays Co. absolutely needs to address this issue. So many new subdivisions and housing units are going in without any concern for the impact on the natural environment. Some kind of regulation is necessary and incentives are a good way to start to work this in. Hays Co. needs to buy large pieces of property and establish bio preserves to maintain the natural legacy of the area. I think the cultural legacy needs to be preserved as well, and I don't think these two ideas are mutually exclusive.*
- *Additionally, you will need to incentivize buyers within these developments. County tends to value these higher driving increasing annual tax load. If this development is providing a public service (ecological), how do you reward it?*
- *I would also like to see less wastewater treatment package plants and higher TCEQ WWTP standards in the area and would welcome the idea of Hays County requesting some changes to the current TCEQ standards. Lastly I would like to see the most stringent conservation practices along the Edwards Aquifer Recharge zone with specific protections for karst recharge features.*
- *Thanks for asking!*
- *Focus on securing new conservation lands that will connect existing conservation lands, which benefits both recreationists and wildlife.*
- *This is an important tool to be able to incentivize conservation, particularly*

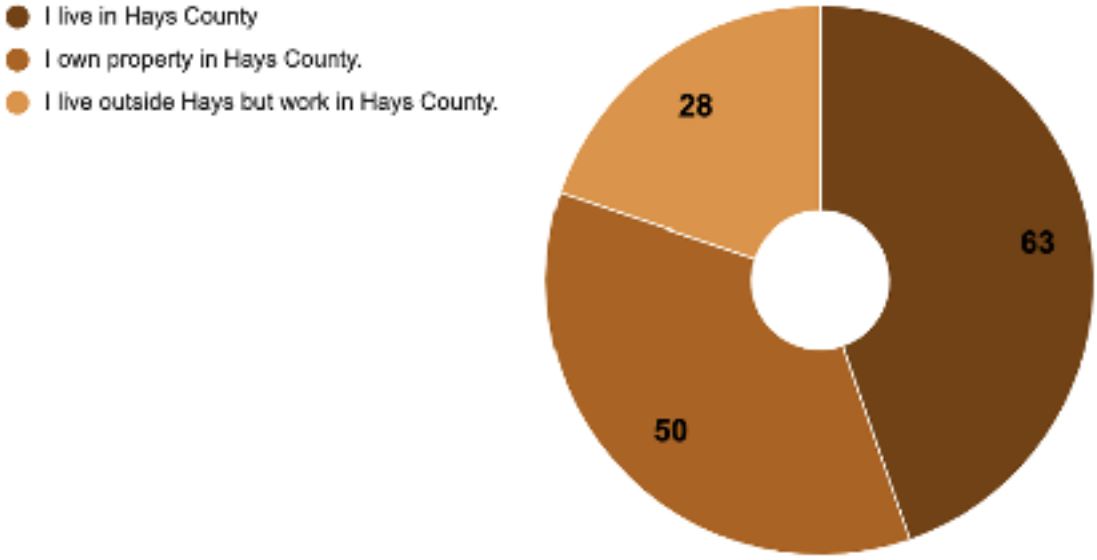
in sensitive areas. A development master plan that considers land, water, and transportation holistically is likely a good natural next step in the planning process.

- *Incentives should only be used for developers/landowners that go beyond current best practices or meet a specific number of acceptable incentive eligible items (example: list of 30 approved items that go beyond typical standards and the developer needs to incorporate 20 of them). Subsidized infrastructure loans for Rainwater/greywater/reuse systems that are incorporated into the development. Restrictions on turf lawn sizes, and mandatory homeowner education on irrigation systems before move in date from the developer. Compliance with International Dark Sky lighting requirements mandatory. Any lands included in the conservation area should be required to have a management plan and allow for inspection/ audit to ensure enforcement.*
- *We have to make sure the legal and tax framework supports conservation development.*
- *Require environmentally friendly development, THEN provide incentives to improve even further. Also, ban irrigation systems!*
- *The problem is not TOO MUCH regulation, but too little. Rainwater capture/ use and wastewater reuse should be REQUIRED. Further, overbuilding of infrastructure (roads, etc) that in turn draws "mad dash development" should be discouraged. What makes an area desirable is the state that it is, not some profiteer's sales pitch what they want it to be.*
- *Conservation development should be encouraged and incentives provided for such development.*
- *cluster development with common area greenspace is a national trend and is more sustainable than traditional subdivisions.*
- *Keep your Green New Deal out of Hays County*
- *The easiest way to do this is work with property owners and have them agree to deed restrict a certain % or area for conservation, or do a conservation easement. This makes the property less valuable, but so does requiring these things after a developer has bought it, and this is more fair, transparent, and predictable, which is all that any developer wants.*
- *Maintaining and restoring native vegetation as part of a conservation plan should be considered for both the conservation areas and individual yards as part of the incentives*
- *Making environmentally friendly construction more cost effective for the consumer is key. Building cookie cutter subdivisions appeals to the masses for cost reasons alone. I think any person seeking to buy a home would like to have bigger lots with more solar / rain water options, but the savings should be seen by the consumer and the property tax payer, not just developers*
- *The main obstacle for developers adopting conservation development is economic - if it doesn't produce equal revenue there isn't going to be an incentive for them to adopt it.*

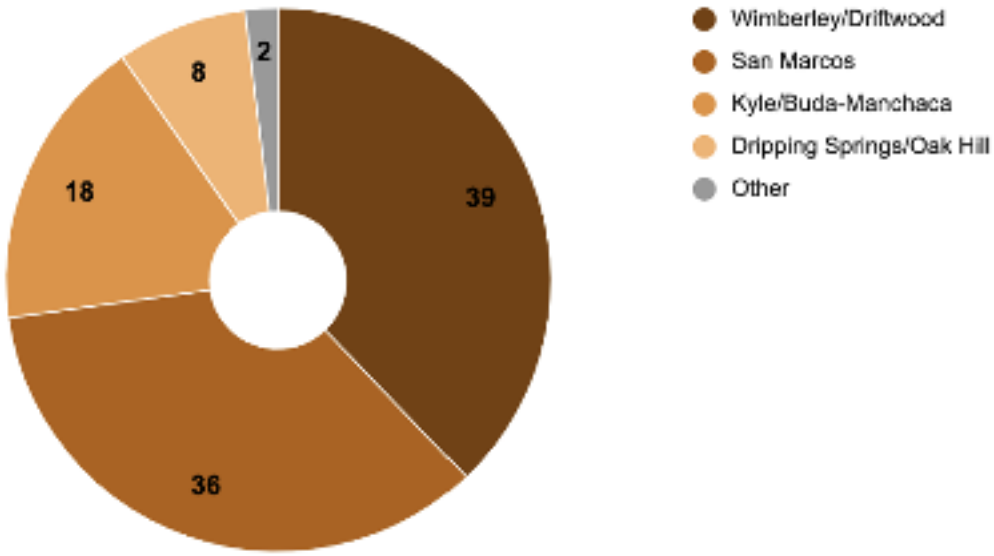
- *Please keep Gov out of the way*
- *I'd like to see Low Impact Development used for residential developments.*
- *No comment.*
- *Native landscaping with little to no irrigation is critical.*
- *Really understanding the impacts of increased residential density in a "conservation" subdivision that does not include the services to support that density; i.e. creating traffic demand to access services.*
- *Incentive s around beneficial wastewater reuse could greatly reduce the impact on streams and reduce the dependence on groundwater for irrigation and non-drinking water.*
- *The cost and time of permitting has always been the chief reason no one will try and develop a conservation planned subdivision. It's one thing to say that it is an expedited process with simple understandable rules and it is another thing when applied in reality. (Theory vs. practice). If a working group is put together to study potential rules, if the group is made of stakeholders who are primarily County employees, environmental groups, and private (small land) owners and not include engineers, surveyors, developers in equal proportions then this will be another pie-in-the-sky idea which will not go anywhere except to pay consultants money to dream it up to not be implemented.*

C2. STAKEHOLDER SURVEY DATA

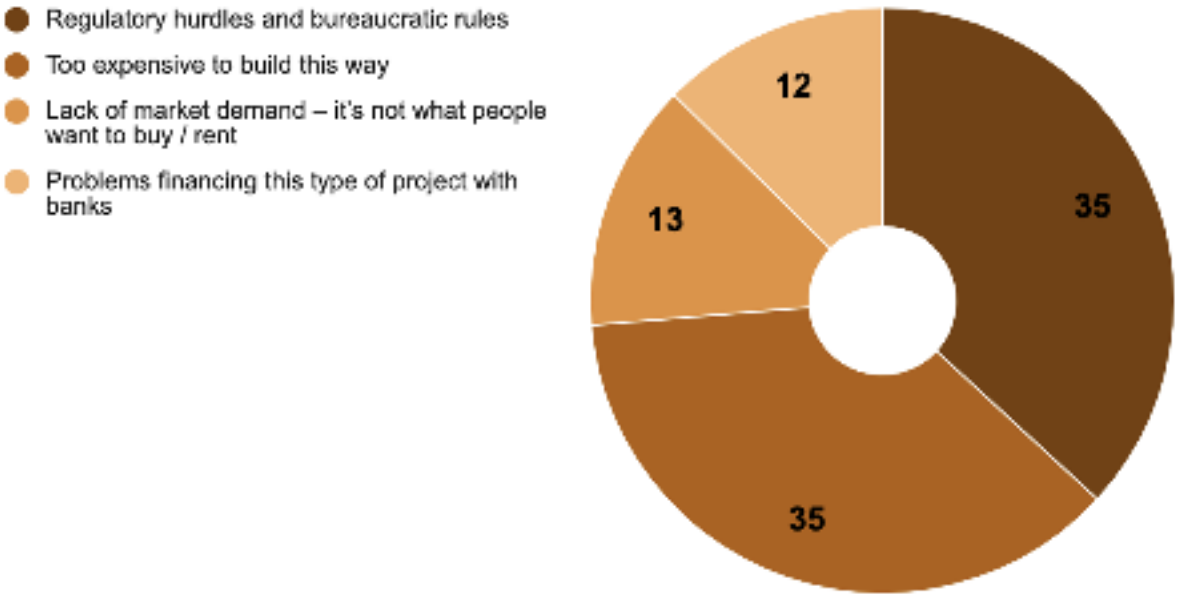
Q1: To help us understand your perspective in this conversation, please choose the description that best fits you.



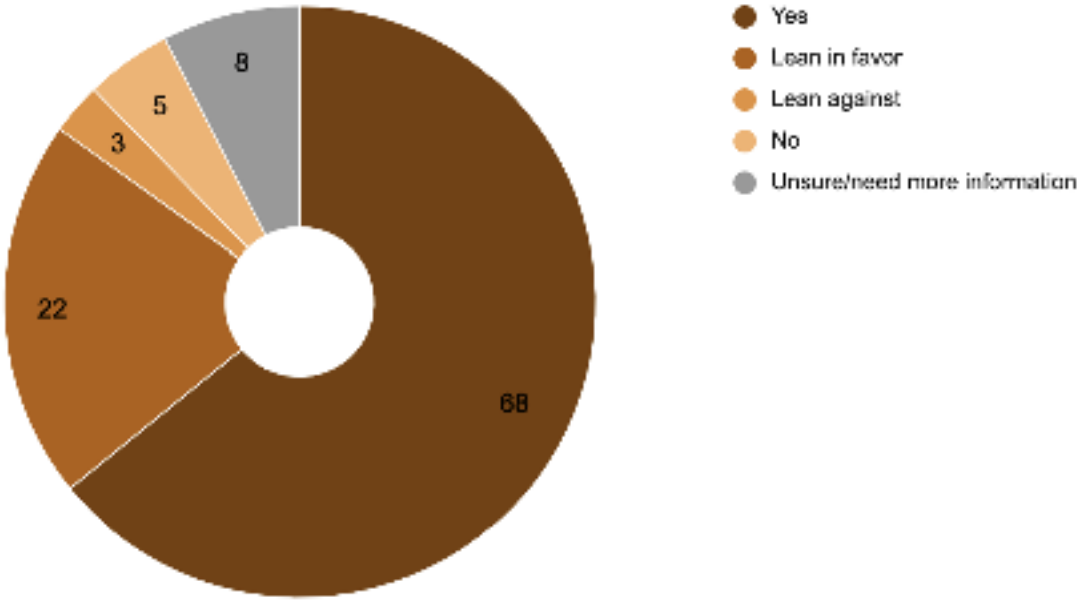
Q2: What area of the county do you live/work in or identify with?



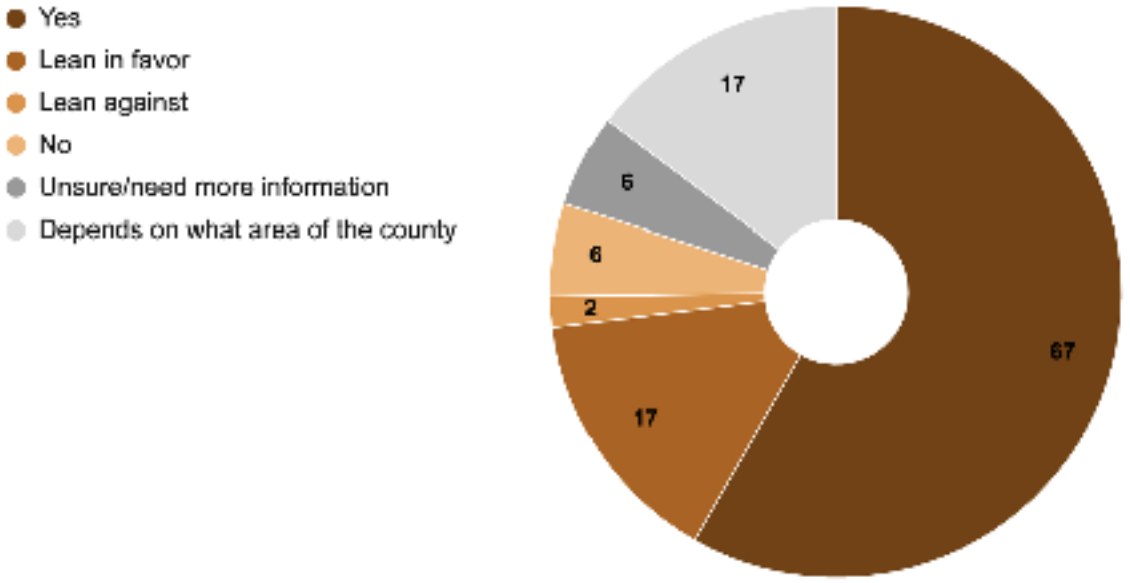
Q3: Which factor most limits conservation developments in Hays County?



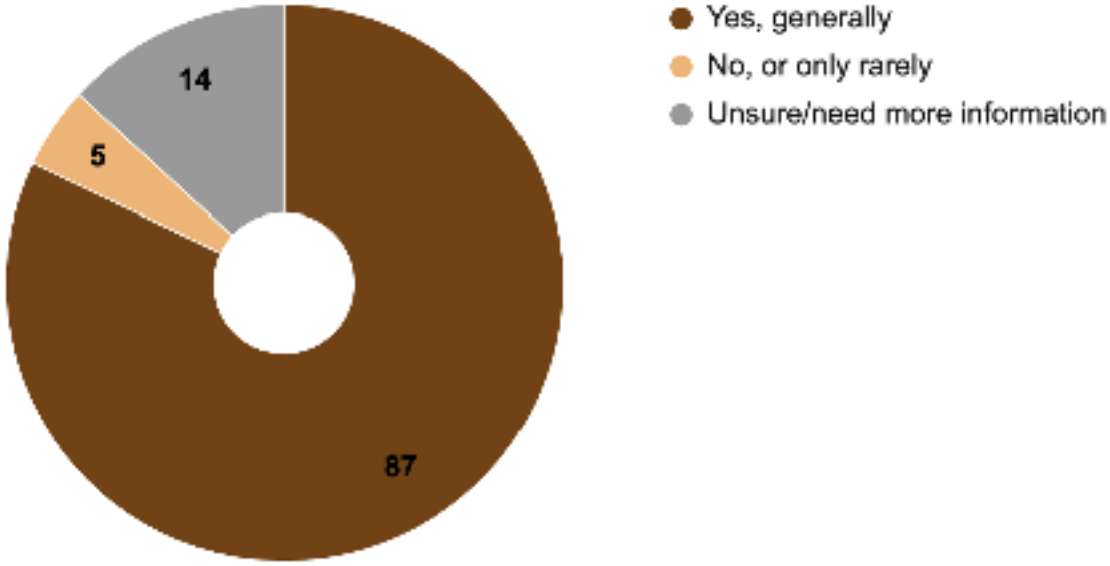
Q4: Do you support the idea of giving landowners or developers incentives if they agreed to adhere to strict conservation guidelines?



Q5: Would you support a revision to the existing county development regulations that would mandate rainwater collection to supplement drinking water in all new developments that do not have access to a public water supply?



Q6: Do you believe homes in conservation subdivisions, with permanently protected open space and other preservation features, appreciate more in value than homes in conventional subdivisions?



APPENDIX D
CASE STUDIES

As part of this report, the Gap Strategies team prepared case studies from conservation developments in other communities in Texas and across the country. Some of these are based on the written works of team member Randall Arendt, author of seminal books on conservation design.

This analysis of "lessons learned" from other communities, combined with design trials on actual parcels of land in Hays County, helped inform the proposed structure of the conservation guidelines presented in later chapters.

D1. CHIMNEY ROCK, TEXAS

Chimney Rock: Product of a Municipal Symposium in a North Texas Town
Location: Cross Timbers Road, Town of Flower Mound
TX Developer: Willard R. Baker
Dallas Site Designer: Randall Arendt, FRTPI, Greener Prospects, Brunswick, **Maine Development Period:** 2002 to 2007

The concept for this project arose at a symposium on conservation subdivision design organized by the town of Flower Mound (population 67,825), whose manager and planning staff wanted to spur interest in this development approach to help preserve the rural character of this community, located 30 miles northwest of Dallas. Fortunately for Flower Mound, Willard Baker, an experienced developer from Dallas, was impressed by the programs presented by the author and by Robert Engstrom, the developer of the Fields of St. Croix conservation subdivision near Minneapolis (another case study in this section).

Flower Mound's conservation design ordinance requires that half the land be dedicated as permanent open space and that lots be halved in area from the town's previous two-acre minimum lot size. (One-acre lots were the smallest that could be allowed in this unsewered part of the municipality.) Incentives in the ordinance include expedited permit review, permit fee waivers, reduced parkland dedication fees, reduction in street pavement width, and rebate of agricultural valuation rollback taxes. As a result of the symposium, Baker asked the author to walk the land and help him identify an open space system to design around and create value for the 48 one-acre lots permitted on this approximately 102-acre property under the new ordinance.

Figure 21-7.1: The layout preserves three significant features of the site: the rural viewshed from Cross Timbers Road, the long, scenic meadow through the middle, and the pond and most of the wooded habitat. Single loading the meadow road was possible by reducing lot widths throughout the development by about 28 feet, very easy to do when conventional lots are 150-200 feet wide. Source: GoogleEarth

Flexibility in the dimensional requirements allowed street alignments to follow contours and preserve the larger hardwood trees, including many post oaks, a native species prized in this region. Three principal areas for conservation were identified early on in the design process: the pond and surrounding woodlands, the long meadow running through the middle, and the public viewshed along Cross Timbers Road (Farm-to-Market Route 1171). Views into the conservation land were deliberately kept open by "single-loading" one-third of the principal street, with lots on one side only. Many developers often reject this approach, erroneously assuming it increases costs. However, since the lots were sized to be trimmer and less-wide, while still being large enough to support upscale residences, single-loading did not increase costs.

A stone chimney from the original farmstead was relocated to the conservation area along Cross Timbers Road, and a large ten-acre "conservancy lot" was created on the opposite side of the entrance, which represented an innovative way of protecting rural character while also providing the client with a high value lot that is restricted from further division and development. Hiking and equestrian trails will connect the property with land owned by the US Army Corps of Engineers to the west, and with a more extensive municipal trail network. The cattle water supply, a rectangular pond that had greatly silted in, was dredged, enlarged, given a more natural shape, and graded gradually around the edges. Dredge material was spread across a former worked-out pasture, and irises were planted along the edge of the pond, which was restocked with bass and catfish. After the cattle were removed, native grasses such as brushy bluestem recolonized some of the open space. A trail is planned to connect the open space in Chimney Rock to the town's trail system, via a link across adjoining land owned by the Corps of Engineers (McMahon, 2010).

From a perspective of a dozen years, the town has learned several lessons. One is the need to

require a clear demarcation between house lots and conservation land, to reduce the tendency of some residents to extend their yards into the open space. For example, Wisconsin's largest developer of conservation subdivisions, Siepmann Realty, prevents this type of encroachment by installing cedar split-rail fencing along all boundaries of the open space it conserves. Over the years the town's original skepticism about allowing trails in conservation areas, which it had originally wanted to leave as undisturbed as possible, has waned. In recent years a growing understanding has emerged that designated trails created by the developer do not compromise the environment, but simply enable neighborhood residents to more fully enjoy the open space.

Figure 21-7.2: Large individual oak trees were designed around and retained beginning at the entryway (left) and continuing through the middle of the development (right). (RA both)

Figure 21-7.3: Two views of the long central meadow, as seen from the road bordering it. (RA)

The approval process for Chimney Rock, the first conservation subdivision in Texas, ran smoothly because staff and officials welcomed the proposal. Sales velocity of the lots was above-average initially, but later slowed a bit due to a less-robust economy. However, the project's financial success persuaded the developer to engage the author's services to design a second conservation subdivision in town (The Sanctuary). He was able to quickly sell that one in its entirety to a national builder (Toll Brothers) soon after receiving municipal approval, and

realized a rapid return on his investment. Such success convinced Baker to favor this design approach in future projects.

Figure 21-7.4: The conservation land around the pond retains a deliberately natural, unmanicured edge, with interesting stone formations preserved nearby. (RA)

D2. MONTGOMERY FARM, TEXAS

Montgomery Farm: A Greenway Community with Mixed Uses, Public Art, and a Working Tree Farm
Location: Allen, TX
Developer: Emerson Partners Inc., Dallas, TX
Site Designer: Randall Arendt, FRTPI, Brunswick, Maine
Development Period: 2001- ongoing

Located 17 miles north of the center of Dallas, in Allen (population 89,640), Montgomery Farm blends three distinct elements: a 1,200-home residential development (on 415 acres at full build-out), laid out according to "conservation design" principles incorporating a network of local parks, neighborhood footpaths, and regional multi-use trails; a working tree farm and an 82-acre land trust preserve covering approximately half the property; plus a 76-acre "new urban" mixed-use center designed around a central greenway.

Figure 22-2.1: A sinuous parkway (Bethany Drive) crosses Montgomery Farm, where multiple fingers of open space lead to the major conservation areas along Rowlett Creek. Source: Montgomery Farm

Greenways are in fact the unifying characteristic of all three elements, and are one large reason for the popularity and success of this remarkable community. Covering 250 acres, the residential component includes 600 single-family homes and 220 townhomes in seven distinct residential neighborhoods. Several are within easy walking distance of an elementary school and a middle school, connected by footpaths providing convenient access in accordance with national standards for "safe routes to school". From a business perspective, the return on investment has been substantial, with faster sales velocity and price premiums of 30 to 40 percent for new homes (based on prices per square foot).

Bethany Drive is perhaps the single most visible feature of Montgomery Farm: a 6,000-foot long parkway winding through the heart of the community, connecting the Central Expressway (US Rt. 75) with Alma Drive. As much public art as vehicular thoroughfare, it was designed by a collaboration of artists, environmentalists, and designers specializing in green construction. In addition to its sinuous curvature, the highlight of this unique roadway is its central median, varying in width and elevation and planted with more than 600 native trees, native wildflowers and grasses which beautify the landscape, conserve water, and require minimal maintenance. Earthen berms, similarly planted, soften its appearance and reduce noise pollution to nearby homes, while parallel walking and biking paths built away from traffic offer safety for neighborhood families.

Figure 22-2.2: Medians in the gently-curving parkway vary in width and height, and are planted with native trees and wildflowers. Sources: Montgomery Farm, and RA photo

The design concept for the meandering alignment and the median's varying width and height was generated by Brad Goldberg, an internationally renowned sculptor who worked with a team of four artists and four engineers. Arched entrance ways leading from the parkway into residential neighborhoods to the north and south, covered with vegetation, were designed by Graham Greene, FAIA, who also selected plant materials known for drought resistance and low maintenance.

At its western end a limestone tower (the cisterna) designed by Goldberg rises from a landscaped pool. Topped with a three-bladed wind turbine, it creates a special terminal vista. Energy generated by the turbine powers pumps circulating water from the pool to the top of the stonework, where water tumbles down, becoming aerated in the process.

The parkway, median, arched entrances, and cisterna have together created an impressive and instantly recognizable grouping of landmarks.

Greenways and Trails. Montgomery Farm is also significant for its extensive network of walking trails and multi-use paths shared by cyclists, joggers, and pedestrians, totaling 14 miles when completed. These linear elements link neighborhoods to each other, to an elementary and a middle school immediately to the north and west, to various natural areas such as the Connemara Meadow, woodland gardens, community garden, and the multiple tree farms, and to the offices and retail shops at Watters Creek mixed-use development.

Figure 22-2.3: Old Bethany Road, abandoned decades ago, serves as a greenway trail (left), connecting with spur paths to neighborhood parks (right). (RA both)

A six-city trail is planned to extend through Montgomery Farm, connecting Frisco in the northwest with Dallas to the south. A trail hierarchy has been established to provide slower and faster travel options. Among the former are safe routes through the most sensitive natural areas of the property where cycling speeds are limited to be compatible with pedestrians such as seniors, young parents with strollers, etc., who move along slowly, linger, and savor the scenic experience, Among the latter are wider multi-use bikeways through other areas for serious cyclists such as commuters and others wishing to pedal quickly from point to point. When all the subsidiary trails are added to the 37 mile core path of the six-city trail, its total length will exceed 100 miles.

Tree Farms and Open Space. Tree farms cover 155 acres, mostly in the lower lands along Rowlett Creek. Playing an important economic role in generating ongoing income, they are also available to the public for dog walking, bird watching, and similar passive activities. By late 2011, more than 32,000 whips had been planted, among them cedar elm, live oak, burr oak, red oak, and pond cypress. Unlike at most commercial nursery operations, these saplings are grown according to dryland farming techniques, with very little or no irrigation, mimicking conditions in nature, producing saplings that are hardier when transplanted into unirrigated locations. (The technical reason is that young tree cells do not expand quickly when rainfall is the only source of moisture; trees with cells bloated through regular watering require pampering when transplanted.) The extremely high rate of transplanting success (94 percent) is due to careful matching of native tree species to local soil conditions. Among the best matches for the soils on this property are cedar elm, live oak, and red oak. Cultivating between tree rows keeps roots more compact, facilitating transplanting after several years in the nursery. Weeds are controlled to maximize absorption of rainwater into the soil benefitting the trees.

Figure 22-2.4: Over 150 acres of the conservation land is put to productive use as a commercial tree farm, and ideal arrangement on the fertile floodplain soils in that part of the development. Sources: RA left and right. Montgomery Farm center.

In addition, more than 7,000 trees have been moved from other parts of the property where land was later cleared and graded for development, and have been stored in nurseries on the tree farms awaiting new neighborhood parks where they will ultimately be planted. Sparing those trees has also saved the developer $6m in mitigation costs that he was not required pay to the city under its tree mitigation ordinance authorizing Allen to charge developers $200 per caliper inch for removing trees under five inches dbh, and $600 per inch for trees greater in girth – sums that are a huge deterrent to tree removal.

Interestingly, the idea for such regulation in Allen was initially advocated by the developer's mother, Frances Montgomery Williams, in the 1970s, and those regulations became the model for numerous cities in Collin County. However, Allen is one of only a very few Texan cities to have created a mitigation bank to provide developers with necessary flexibility regarding where trees will be removed from and where they will be replanted within the 1,200-acre property.

In addition, a number of large trees have been saved from clearing activities on other development parcels in the area, which yielded more than 30 trees ranging in diameter up to 15 inches.

Besides the extensive tree farms and nursery, the open space system includes an 82-acre pecan grove (Connemara Meadows) where local teachers conduct outdoor nature classes and local environmental groups conduct annual educational events to raise awareness. This property was deeded to the Connemara Conservancy in 1981 by Williams family members, who were also instrumental in creating the land trust for this purpose, as well as for promoting the preservation and protection of open spaces in North Texas.

Figure 22-2.4: Classes from local schools regularly participate in educational field trips to the meadowlands on parts of Montgomery Farm that have been donated to the Connemara Conservancy, where they study plants and wildlife. Source:

D3. VILLAGE HOMES, CALIFORNIA

Village Homes: Edible Landscape Planting, Solar Design, Bike Path Networks, and Rain Gardens
Location: Davis, California
Development Period: 1975-1981
Site Designer: Michael Corbett, Davis, CA
Developers: Michael and Judith Corbett, Davis, CA

The concept of green development was pioneered by Village Homes which, in 1975, set standards that relatively few subsequent projects have matched. Due to its modest lot sizes, Village Homes has preserved two-fifths of its land area (nearly 28 acres) for a variety of open spaces, including neighborhood greens, community commons, playing fields, greenway corridors, allotment gardens, orchards, and a small vineyard. Twelve acres are in food production, and about 75 percent of the produce consumed by Village Homes residents is raised there, according to co-developer Judy Corbett, a trained ecologist. The 60-acre site supports 218 single-family homes (40 percent of which have common walls) located on lots averaging 2,600 SF from 25 ft. to 55 feet, the narrower lots having common-wall homes. However, the predominant lot width is about 35 to 40 feet, and lot depth is 65 feet on average. Homes can be built to within five feet of property lines. Some families have added "granny flats" on the larger lots.

A small commercial area with four buildings houses seventeen small businesses operated by Village Homes residents. Over the years the businesses have included a dance/exercise studio and a restaurant, plus offices for architects, environmental engineers, therapists, dieticians, psychiatrists, and attorneys. A fifth building serves as a community center and is used for child care during the day. Turnover occurs very infrequently, and vacancies have been both

extremely rare and short (email from Judy Corbett, community co-founder, 1.11.14). Rent from these buildings, combined with proceeds from the annual almond harvests, help pay for maintenance of the common greenbelt areas. The buildings were built on property deeded to the homeowners by the developers. Local residents loaned the money to construct the buildings and receive monthly dividends. All lenders have now been bought out. (Corbett and Corbett, 2000).

Figure 20-5.1: Greenway paths behind every houselot enable residents to walk, jog of bike from their homes to any other part of the community, and to the Davis bikepath system connecting them to downtown and the university campus. The larger of two playing fields (right) is frequently used for both informal and organized sport. Sources: Plan – Ross Chapin and Taunton Press. Photo RA

This remarkable project is a testament to how developers and local governments can achieve multiple conservation goals through extensions or infill built at the moderate density of four dwellings per acre. Village Homes is located within easy biking distance of both the University of California campus and a major retail and service center, in this city of 66,000.

Figure 20-5.2: Greenway paths border a number of open space areas such as the community garden (left) and the large multi-use field to which the family on the right is headed. (RA both)

The principal site designer and architect, Michael Corbett, advocates that open space in new neighborhoods should serve four related purposes: (1) it should be visually attractive; (2) it should attract residents to use it regularly, making it a place of social connections; (3) its

landscape plantings should be largely edible (oranges, figs, grapes, etc.); and (4) nearly all stormwater should be retained on site, recharging the local aquifer.

As at Radburn, pedestrian needs, rather than those of the automobile, were the foundation of the neighborhood design. As streets are narrower and single-entry (not through-streets), they can be safely shared with people on foot or bicycle. An extensive network of paved trails 8 to 10 feet wide parallels the streets along rear lot lines, connecting every home to each other and to the neighborhood open amenities such as playing fields, community gardens, mailbox clusters, shaded sitting areas, and the daycare center. Pedestrians can access this network through their backyards which border paths that also connect with the ends of all the cul-de-sac streets, or by way of mid-block passageways running from the streets to the walkway system.

Among the original tree species comprising the edible landscape planting were oranges, pears, peaches, plums, cherries, figs, almonds, grapes and persimmons. Over time, that list has grown to include pomegranates, apricots, nectarines, Asian pears, walnuts, pistachios, and a small collection of more exotic fruits such as jujubes. Residents can and do pick fruit (using special ladders provided in every neighborhood), but the almonds are reserved for mechanical harvesting and are sold, with their proceeds (about $3,000 per year) going to the community's maintenance fund, helping to keep homeowner association dues relatively low.

Figure 20-5.3: Residents pick fresh cherries and other fruit from edible landscaping in the common areas. Front yards generally take the form of enclosed courtyards, providing private outdoor space. They are attractive both inside and out, and function best in equable climates. Parking spaces are located next to courtyard entrances, and sometimes take the form of covered carports. (RA all)

To create a simple but highly effective stormwater management system, Corbett essentially contoured the totally flat site (formerly tomato fields), creating very low, broad ridges and very shallow, broad swales that are so subtle they are almost unnoticeable unless one is looking for them. Runoff from the streets and homes, which are located on the mini-ridges, flows downhill toward the greenway corridors behind all the backyards, where infiltration trenches backfilled with sand and gravel absorb the stormwater and recharge the aquifer. (After the first year the soil below the swales in this semi-arid area had become dampened to a depth of three feet; by the third year that had increased to 18 feet.) Because of the stormwater recharge, landscape irrigation has been reduced by one-third, compared with other nearby developments. This sensible arrangement works much better than conventional designs where runoff flows onto impervious streets and is then conducted via pipes to large detention basins with little infiltration capability. In fact, during a huge rainstorm in 1972, when conventionally-

designed streets in adjoining neighborhoods flooded, the natural drainage system in Village Homes performed perfectly, absorbing the excess stormwater overflowing into it from nearby properties.

The developer estimated a savings of $800 per lot (in 1975 dollars) by eliminating curbs, gutters, and underground pipes , money that was then re-invested in more landscaping for the common areas.

The relatively modest paved street width of 20 feet works well because driveways and parking bays near garages provide adequate off-street parking spaces. Less-wide streets have translated into lower maintenance costs and reduced stormwater runoff, in addition to smaller upfront infrastructure costs and slower/safer travel speeds. Reduced asphalt coverage, combined with a higher proportion of the narrower street surfaces being shaded by the street trees, has lowered summer air temperatures above these streets by 10 to 15 degrees, compared with temperatures in conventional subdivisions.

Residents tend to own their houses longer than average, often remodeling and expanding them instead of buying larger homes elsewhere, signaling a high level of satisfaction with the community. Superior site design adds measurable value to houses in Village Homes, where selling prices are typically 13 percent higher than those in conventional subdivisions with large lots, but without open space. Price premiums were reported to be $10 to $25 per square foot in 1998 dollars, with higher sales velocity (houses selling in 30 percent less market time) (Wilson, 1998).

When houses go on the market, the average sales period is half that for Davis as a whole. However, realtors initially shunned the project and even discouraged potential buyers from visiting it because they did not understand the concepts involved. This underscores the need for green developers to educate realtors and buyers. Due to Village Homes' strong sales (and re-sales) the city's leading realtors now describe it as Davis' most desirable neighborhood.

Figure 20-5.4: Swales in the greenways behind every house absorb stormwater and allow it to infiltrate into the ground. They are crossed by small footbridges where they intersect with footpaths (left), and are sometimes filled with crushed stone where greater runoff volume is expected. (RA both)

The greenway-based layout reflects and improves upon the internationally-respected 1928

Radburn development described earlier in this chapter. Twelve cul-de-sacs provide vehicular access to the fronts of the homes and their private courtyards, while the semi-private "garden sides'' in the rear are very well connected to an extensive footpath network linking the neighborhoods through the greenway areas behind every backyard. The common areas behind the houses vary between 30 to 50 feet in depth. The absence of second access ways has never presented a problem, contrary to concerns often expressed by public safety officials about such "single-access" streets being blocked in the event of an emergency. The well landscaped front parking spaces demonstrate an alternative to costly alleys, and allow rear yards to abut verdant greenways.

The Radburnesque layout with cul-de-sacs and greenways greatly improves safety for children. Writing of his childhood years in Village Homes, Christopher Corbett recalls that "Even when we were very young, the network of greenbelts allowed me and my friends to go anywhere in the community without facing the danger of crossing a street. We could walk out our back doors into greenbelts full of all kinds of trees to climb with fruit to eat and gardens with vegetables to nibble on." (Corbett, 2000.)

Bicycling and walking are the most popular way of moving about, as the extensive network of multi-use paths provides the quickest and most direct connections to the bikeway system at the university campus. It has been estimated that Village Homes residents drive 2,000 fewer miles per year than their counterparts elsewhere in town.

The streets in Village Homes were deliberately aligned along approximate east-west axes to assure good solar opportunities for all the houses, which were designed with at least 60 percent of their glazing facing south. Deep roof overhangs on southern elevations screen summer sun but allow winter rays to reach concrete slab floors that absorb solar energy during daylight hours and release it slowly after nightfall. Roofs are heavily insulated and most are fitted with solar panels that heat tap water. Because of these features, 50 to 75 percent of heating needs are met directly by the sun.

Village Homes is also very notable for its social aspects. The average resident knows 42 people living in their neighborhood, compared with 17 by those in other developments. Compared with people living in nearby conventional subdivisions, Village Homes residents report having twice as many friends and three times more social interactions (Lenz, 1990).

Homes are arranged in pocket neighborhoods of eight dwellings, each group arranged around its own semi common area (about 15,000 SF.) where landscape features were selected by the first homeowners to encourage neighborly interaction. Maintenance of these pocket areas is performed by the dozen or so families living around each of them. The original landscape options included a variety of fruit-bearing shrubs and

Figure 20-5.5: Small, semi-private neighborhood commons are the central focal point of each shared space. As the above sketch shows, because the streets were aligned on an approximate east-west axis, each home enjoys south-facing solar access, either on the front or rear façade. A typical passive solar house design is on the right. Sources: RA left and right. . Ross Chapin and Taunton Press, center.

trees, fire pits, sandboxes and gardens for flowers and herbs. Larger community gardens for herbs and vegetables are situated at the ends of the cul-de-sacs and serve as a buffer along the site's long, western boundary. These open spaces provide casual meeting and greeting opportunities and have contributed to a general neighborly feeling among residents of these housing groups, manifested in some cases by regular pot-luck dinners. Community-wide events occur at various times of the year, the most popular being the autumn harvest party. Children of all ages enjoy the many playgrounds and large commons that also serve as playing fields used weekly by local teams. The solar-heated community center provides daycare facilities, a meeting room for homeowners (which is available for rent), and a swimming pool. Other buildings in the complex offer business offices, a dance studio, a restaurant and second-story apartments.

D4. POPLAR GARDENS, COLORADO

Poplar Gardens: Permanently Affordable Cottages in a Bungalow Court
Location: Poplar Avenue, North Boulder, CO
Site Designer and Architect: Wolff Lyon Architects, Boulder, CO
Developers: Affordable Housing Alliance and Boulder Housing Authority
Development Period: 1994-96

The bungalow court design approach was chosen by the Boulder (Colorado) Housing Authority as the preferred neighborhood type for the Poplar Community, or Poplar Gardens, a group of 14 owner-occupied single-family homes, begun in 1994 and completed in May 1996 on a 1.4-acre site in North Boulder (population 49,397). Arranged with front porches and gable ends facing a central green, the project was initiated by the Affordable Housing Alliance, a local non-profit which partnered with the City Housing Authority. Boulder Housing Partners provided the land, which is held by a land trust, and the Affordable Housing Alliance designed and constructed the project in collaboration with the new homeowners. The homes were designed by Wolff-Lyon Architects, also of Boulder. Poplar Gardens exemplifies the excellence that can be brought

to affordable housing development through creative collaboration. This outstanding project has earned four awards, including HUD's Blue Ribbon Practices in Housing and Community Development Award.

Figure 20-12.1: Picket fences define and separate private spaces from public areas in this very compact neighborhood design. Gable-end orientation and narrow/deep design enables houses to make efficient use of the land. Unlike many cottage courts, Poplar Grove opens up to public view from the city street at one end, helping to integrate it into the community. Source: Wolff-Lyon Architects

Homeowners typically purchase the units for about half the market rate, according to the Alliance. According to the architects, "homebuyers earned between 45 and 75 percent of the local median income, and each family contributed a minimum of 300 hours of their own 'sweat equity' to the construction of the homes. Additional donations of material and labor reduced overall construction costs by $250,000." (source -- www.wlarch.com/projects/poplar.html) The homes are permanently affordable due to resale restrictions limiting appreciation to three percent per year. In its first 15 years, only three of the 14 homes changed hands, an indication of homeowner satisfaction.

Unlike many cottage courts where the parking is centralized at the edge with walkways leading to each house, at Poplar Gardens each home has its own rear garage or parking pocket, accessed by a perimeter lane – which is particularly desirable in a snowy climate. Each home is also provided with a storage shed that helps buffer the parking spaces and the back lane from the central green. At 900 SF. in size (with 500 SF basements), the homes initially posed a concern to neighbors living in larger houses, but the design is so attractive and traditional that most passers-by do not realize the homes are in fact affordable.

Figure 20-12.2: The view into the long green, from the city street, is extremely pleasant. The atmosphere is enhanced by extensive shade tree planting, a critical component that is often overlooked, perhaps because landscape architects are not always included on design teams (a shortcoming that updated codes can correct).

Among the design characteristics of Poplar Gardens are the following:

- Siting homes at one corner of their lots and along one side lot line provides greater privacy and maximizes the options for outdoor living.
- Facing homes and front porches (large enough for sitting) onto the central green, locating front doors opposite each other and clustering mailboxes at he entry to the neighborhood helps to generate a sense of community.
- Picket fences along front lot lines help define the boundary between private and public realms.
- Marking pedestrian entry points to the courtyard with attractive landscape features (such as trellises and climbing roses) creates a beautified welcome and enhances the entire neighborhood.
- Planting shade trees at regular intervals around the perimeter of the green helps create a more user-friendly space. Flowering ornamentals and fruit trees within each dooryard garden augment the landscape.
- Densities of 7-10 dwellings per acre are commonly achievable in a comfortable manner, with homes often spanning the range of 850 to 1250 sq. ft. (or more)
- Vehicular access is provided via one-way rear lanes (or alleys). Parking is provided in the garage or in small pockets between the homes.
- When both ends of the central green open to a public street, the court becomes a “greenway street”.

D5. TWIN BUTTES, COLORADO

Twin Buttes: Epitomizing an Enlightened Planning Process
Location: Durango, Colorado
Owners: Glenn and Terri Pauls, Durango, CO
Site Designer: Barrett Studio Architects, Boulder, Colorado
Development Period: 2008 – ongoing

Named for a pair of hill-like geological formations (sometimes called The Sisters), located two miles west of downtown Durango (pop. 19,000), the 600-acre Twin Buttes project exemplifies a comprehensive, thoughtful and sensitive planning process -- one that could serve as a model for other communities interested in promoting sustainable design, in terms of both private sector initiatives and public sector support and involvement. Following several years of intense debate between project supporters and opponents, the project passed a major approval milestone in 2009. Final project approval in 2014 was conditioned on adoption of specific Sustainability Guidelines prepared by the applicant but reviewed and accepted by the City. Like many other developments around the country, Twin Buttes lay mostly dormant for several years during the Great Recession, but the developer took that opportunity to install a lot of the infrastructure. Final steps to commence construction were approved in 2014. The first houses were completed in 2017. As of July 2020, $8-10m worth of properties have been sold, according to the developer. Due to moderate growth in the Durango area, both the developer and the city are anticipating an absorption rate of about 25 lots per year. In terms of sales, the recent impact of the coronavirus pandemic has been positive, with more people looking to relocate to a less-dense rural area, compared with the suburban locations they are leaving.

Project approval allows for 655 dwellings, plus 135 permanently-affordable accessory dwelling units, 140,000 sq. ft. of commercial and civic space, in addition to land donations for a charter high school and a public elementary school. Although Durango's Fair Share ordinance originally required that 16 percent of the multi-family units be affordable, this requirement was later changed to substitute a 1 percent transfer tax, with the proceeds dedicated to subsidizing housing costs for eligible applicants. About 480 acres (or 80 percent) of the property is permanent open space including several acres of agricultural production at the Twin Buttes Farm. This CSA membership operation produces fresh vegetables, fruit, herbs, flowers, honey and eggs, following organic, sustainable practices. Landscape plantings feature several varieties of fruit- and nut-bearing trees, similar to the edible landscaping integrated into the design of Village Homes in Davis CA in the mid-1970s. The agricultural component includes a community barn at West Meadows, a historic structure from the site's ranching days.

Public sector planning began with the City's recognition that this area of the County required a special collaborative approach prior to its likely annexation into the municipality. Questions of which areas should be developed and which should be preserved were uppermost in many people's minds. Owned by the Pauls family of Telluride, the Twin Buttes property (previously the McIntyre Ranch) potentially offered a key location for creating a nearby and compact development on a greenfield site within a 15- minute bicycling distance of the downtown core, and also ensuring that no one lives more than a half mile (10-minute walk) from a transit stop.

The need for more affordable (workforce) housing was also extremely evident, with the city's median house price hovering around $550,000. Many of the homes in the first phase, originally in the $550,000 - $650,000 range, now sell for $700,000 to $800,000. Condos that originally began at $250,000 now start at $400,000. Lots range from $120,000 to $325,000.

Figure 1: The compact development footprint will cover just one-fifth (120 acres) of the nearly 600-acre site., blending the new urbanism with conservation design. Much of the permanent open space will remain available for outdoor recreation, such as mountain biking, hiking, and cross-country skiing. Source: Barrett Studio Architects

At a preliminary meeting in 2005 to outline Durango's objectives in the rezoning process, the City Planning Director defined the basic concepts that a successful application would incorporate. Among them were preservation of the riparian corridor, maximizing open space, provision of affordable and attainable housing, dual access, wildlife conservation, a compact development footprint, sensitivity to public viewsheds of the hillsides and ridgelines, and implementation of sustainable and green building practices.

Figure 2: The eastern end of the site will contain an "artisan core" with homes, offices, cafes, specialty shops, transit hub and day care center grouped around a large green. Source: Barrett Studio Architect. *Update -- The Artisan Core includes a bakery, yoga studio, bike shop, hair salon, a couple of art galleries, a boutique, and more.*

Encompassing some 600 acres of foothills ranging in elevation from 6,600 to 7,740 feet – much of which is covered by Ponderosa and Pinyon-Juniper forest – the property lies at the edge of

southwestern Colorado's principal city. Twin Buttes' location on one of the city's major "gateway" approaches heightened the need for a particularly sensitive approach to siting and designing this major new development in the relatively pristine, open (semi-wooded) landscape, where visibility issues were a shared concern.

Due to the strategic importance of this location, the City has designated the area as a Specific Policy Area, which identifies areas "subject to specific policies affecting the timing, type, density and location of authorized land uses," and adopted proactive policies in its 2007 Comprehensive Plan to ensure that both the planning process and the resulting product would be of the highest caliber.

Figure 3: Twin Buttes has a multi-acre community garden, and will provide continued opportunities for cattle grazing. In the center is an historic ranch barn that is being preserved, and at right is the sales stand at The Farm. Source: Barrett Studio Architects

Private sector planning began in 2008 when the property owner (the Pauls family) engaged Eric Flora of Lightner Creek Ranch, LLC, a regional developer with a track record of construction in Telluride. One of the first steps taken was to acquire three key parcels between the ranch property and US Highway 160 to improve highway access and to eliminate the visual blight created by a nine-acre auto body and salvage operation and an 11-acre nursery site with outdoor equipment storage.

Working closely with city staff from the beginning, to help ensure that the planning and design process would run smoothly, Flora (who remained with the project until 2015 when infrastructure construction began) in turn engaged the professional services of the highly-respected Design Workshop of Denver in 2006 to prepare a concept plan that would create an authentic community with social vitality, not just another semi-rural, large-lot subdivision. After the election of three new City Council members in April 2007, the Council held a retreat to discuss their common goals, one of which was growth-management criteria and general design standards to guide the Twin Buttes rezoning process. The result was greater emphasis on open space preservation, affordable / attainable housing, adequate public facilities and impacts mitigation, and development sustainability.

Fig. 4. On the left are two semi-detached homes on a sloping site (with the main floor at grade, in the back). On the right is one of the single-family homes.

In light of the increased emphasis on sustainable design practices, the developer hired the renowned Barrett Studio Architects (BSA) firm of Boulder, which had much experience designing master-planned communities in the intermountain West, to lead the multi-disciplinary team through the master planning, city entitlement, and architectural development process. Of particular interest was Barrett Studio's emphasis on implementing an "EcoVision", providing a superior alternative that would foster a growing constituency of informed and environmentally-conscious citizens.

Barrett Studio re-worked the plan to create a personality and sense of place by introducing a central green and plaza, reducing lot sizes, and organizing development around the site's natural assets. In so doing, it substantially expanded the open space network, oriented structures for better solar access, and provided community gardens and a quasi-organic farming element to supply fresh produce for an on-site organic restaurant and area farmer's market, thereby reducing dependence on automobiles.

The site itself encompasses a wide variety of landscapes and ecosystems. These range from verdant wetlands along the riparian corridor of Lightner Creek up through rolling semi-arid meadows cut by occasional draws, and farther up to the upper reaches of the eponymous pair of buttes, by which this gateway is identified and for which this exceptional new community is named.

At the heart of the early design process was an extensive site analysis (performed by BSA and the Design Workshop), to inform the creation of a comprehensive Opportunities and Constraints Map. Elements that were combined and examined included data layers for topography, slopes steeper than 30 percent, solar access, natural drainages, floodplains, and key wildlife habitat and travel corridors. Among the wildlife at Twin Buttes are deer, turkeys, elk, fox, coyote, cottontails, a wide variety of birds, and the occasional black bear.

This logical approach echoes the classic "sieve mapping" technique advocated by several generations of British geographers. The Scottish landscape architect Ian McHarg popularized

this approach in his 1969 award-winning book Design with Nature, 15 years after emigrating to the United States.

Village-like nodes of development were carefully fitted into this map, ensuring that site constraints were observed and respected, rather than being imposed upon. As the Master Plan evolved and affordability issues were factored in, BSA researched and prepared an Environmental Economic Analysis (in concert with the Resource Engineering Group) documenting potential economic benefits created by the project's innovative infrastructure and sustainable design features.

Planned at the overall density of one dwelling per acre (but five dwelling units per acre of developed land), Twin Buttes blends the principles of conservation design and elements of the new urbanism in a Smart Growth hybrid manner to limit the development footprint to just one-fifth of the site, leaving 80 percent (480 acres) as permanent open space. The open space includes 11 acres of parks and community gathering spaces crisscrossed by eight miles of informal natural surface footpaths, as well as a paved spine bikeway, making it a very walkable and bikeable place in which to live. The bikeway will also be connected to downtown Durango along a multimodal path constructed by the City.

A reasonable balance between recreational and educational uses and environmental and habitat preservation goals was ensured by collaborating on the plan for the open space network with the Colorado Department of Wildlife and the City's Open Space and Trails Advisory Board , in conjunction with use of wildlife studies prepared by Ecosphere.

Another parallel to Village Homes (the first is landscaping with fruit- and nut-bearing trees, mentioned above) is the decision, taken very early in the planning process, to orient the slightly curvilinear street grid so its long axes would run with (and not against) the terrain in a generally southeasterly direction. As a result, the vast majority of homesites enjoy a southwesterly exposure, ideal for capturing solar energy. Home construction will also feature a number of green building techniques and materials. All homes must be designed to use 50 percent less energy than homes built to code. Homes must also be built within solar envelopes, and are encouraged to utilize passive solar design and rooftop orientation. Homebuilders are also encouraged to utilize a palette of natural and organic building materials detailed in standards developed by Barrett Studio.

A third parallel to Village Homes is the progressive way in which some of the stormwater runoff is handled, with decentralized rain gardens and gravel-filled infiltration trenches close to their sources, where runoff recharges into the groundwater aquifer. In another effort to minimize water use in the arid west, permission was obtained from the Colorado Health Department to allow for the innovative use of greywater treatment systems, in which water used in showers, washing machines, and bathroom sinks is reused for landscape irrigation or in toilet tanks, which saves thousands of gallons of water each a year per household.

Another sustainable aspect of the project is its approach to fire mitigation and thinning. Located in the Wildfire-Urban Interface, Twin Buttes was required by the city to create a fire management

plan that called for thinning forests and clearing zones around houses. The thinned logs, plus boulders and rocks excavated from the property, are used in project construction. Twin Buttes was also allowed to build a temporary sawmill to process the thinned wood.

Through its Wildlife Management Plan, Twin Buttes maintains critical habitat for deer, elk, bear, and a variety of smaller animals and bird species. Twin Buttes' local wildlife consultants, Ecosphere, earned considerable public respect by not hesitating to recommend changes to some aspects of the project proposal. The Wildlife Management Plan created reserved migration corridors and preserved sensitive areas for winter habitat and nesting for elk and peregrine falcons, among other species.

With 655 dwellings grouped on 120 acres, arranged around two small mixed use neighborhood centers, lot sizes range from 5000 sq. ft. to 67,000 sq. ft. Their livability is enhanced by the advantages provided by solar orientation, community gardens, proximity to trails and open space, and neighborhood amenities. The resulting layout is a successful balance between the twin goals of "community and privacy", which is also the title of Christopher Alexander's first book, in which he demonstrates how these two basic human needs can – and must – be reconciled if we are to create and reside in truly satisfying neighborhoods. A diversity of neighborhood parks, natural areas, small commercial and cottage industry, and community gathering spaces are incorporated throughout Twin Buttes, encouraging a communal atmosphere where residents have myriad opportunities to casually meet and interact with their neighbors.

Of special note is the fact that, of the 655 dwellings, 135 will be embedded affordable / attainable units. Working in concert with the Durango Regional Housing Alliance, affordable needs were identified and planned for in a way that avoids social stigmatization, by designing home exteriors to blur distinctions between affordable and market-rate units. A further strategy known as "varied locations for varied lifestyles" ensures that residents with rather different lifestyles are not grouped together in a one-style-fits-all affordable housing solution. Typically, an affordable housing offering consists of one building block wherein all demographics must fit. Instead, at Twin Buttes, a single woman can live in a loft above the lively shops and restaurants at the Artisan Core, while a family can live in a home close to the daycare and playground at the Artisan Bungalows. This fosters a greater sense of "home" for those living in affordable housing.

Twin Buttes offers a diversity of housing types ranging from multi-family residences and bungalows to single-family courtyard homes and "agri-lofts" (modern loft-like attached homes at the edge of working farmland). A density gradient gradually decreases from the mixed-use Artisan Core in the east (with its daycare, cafes, specialty shops, offices, recreation center, and transit hub), to somewhat larger lots at the West Meadows neighborhood An early idea to maintain the Artisan Core as a car-free pedestrian precinct without standard streets ran afoul of local fire department officials, illustrating how frustrating it can be when different jurisdictions have very different views regarding what constitutes safe fire access. As the Heartwood co-housing community 15 miles east of Durango demonstrates, with its successful car-free neighborhood design, not every fire department in this part of Colorado shares the conservative view held by the fire authority, an independent agency from the city.

The development areas of this "eco-village" occupy a series of small plateau-like "benches" where the land undulates gently, and much of the 12-mile main trail system follows the defunct railroad grade. By using this layout, the need for the kind of major leveling that is so common in large-scale developments was avoided. This leveling practice unwittingly erases the distinctiveness of the land, rendering it characterless and robbing it of the natural beauty that one often sees in neighborhoods built prior to World War II, before large earth-moving machinery became ubiquitous. Those were the days before the heavy hand of insensitive civil engineers stripped and flattened the land through mass-grading techniques intended to create smooth platforms to facilitate what has become known as "production building", a name with as much charm as the resulting development usually offers.

When communities fail to recognize the dangers inherent in allowing unbridled mass-grading, by specifically prohibiting or greatly limiting its use, they open themselves up to land abuse, and literally pave the way for decades of development that is insensitive to the qualities of the terrain and the quiet beauty that respecting the natural landscape can confer on neighborhood design. This is not a difficult concept to grasp or to implement, and the attractiveness of many early suburban developments created during the first three decades of the last century stand as testament to the wisdom of not trying to dominate the land simply because large-scale machinery enables us to do so.

Flora and Barrett Studio used a transparent planning process that engaged the active participation of all parties, who remained open to fresh ideas and alternative thinking, rather than the standard, oft-touted charette approach (typically a very expensive week-long series of public sessions manned by a small army of design professionals), For example, the design team participated in several general community meetings, and also in a number of other meetings with community business leaders and sustainability advocates.

The main story here is largely that the process is equally important as the final product, although a highly publicized charette could help to jump-start the design element and build broad public support early on, if the budget allows. (One community that has fully embraced the charette approach is Davidson NC, which requires some form of charette for every subdivision and every nonresidential development affecting more than several acres. However, as practiced in that city, the process is very informal with many public drop-in sessions, only a few contributing professionals, and low budgets).

Process: Listening to the Land and the People

The public process clearly played a major role in the evolution of the Twin Buttes plan.

Although some members of a limited opposition group expressed anti-development sentiments early on and throughout the design process, community meetings greatly helped to moderate the rhetoric and allow a reasoned discussion to ensue, largely due to the patient presentation of the detailed site analysis, sustainable design principles, and community amenities, building support for Smart Development principles.

As annexation into the City was critical to the financial success of the proposal, and posed a challenge due to the politically charged atmosphere, the development team focused on communicating Smart Growth principles to local officials and advisory boards through a series of public meetings, hearings, and detailed submittal documents. Ultimately, the plan attracted greater public support, resulting in unanimous Planning Commission approvals at the conceptual, preliminary, and final Plan stages, and unanimous approval by the Council of the preliminary and final plans. In casting their votes, many officials cited the project vision, the design documents, and the sustainability / green building focus for implementing the vision.

In March 2011 the project received final and unanimous approval from the City Council, a testament to the hard work and diligence of the development team and city staff.

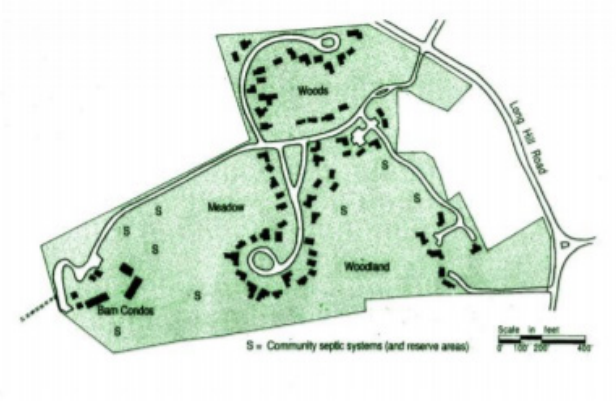
As implementation continues over the course of multiple phases, it will be critical for the developer and the City to maintain open lines of communications with various departments and agencies such as the state DOT and Division of Wildlife, the Regional Housing Alliance, and the school district.

D6. LONG HILL FARM, CONNECTICUT

Long Hill Farm: Multiple Drainfields Serve Housing Groups to Save Open Space
Location: Long Hill Road, Guilford, CT
Development Period: 1987-1991
Developer/Architect/Site Planner: Lauren E. Meyers, Jr., AIA

Set on a 50-acre site in rural Guilford, Long Hill Farm includes a patchwork of former pastures and deciduous woodland in a rolling terrain where granite bedrock outcroppings are fairly common. Fifty-five single-family residences have been sited with an exceptionally skillful eye to take advantage of optimal locations in the uneven forest topography. So much care was taken to preserve large trees near the houses that most homes appear, at first glance, to have been there for generations.

Homes in this upmarket development are located on condominium "lots" typically ranging from 4,500 to 5,000 square feet, with modest clearings for dooryard gardens and landscaped patio areas. Privacy issues have been addressed by the orientation of each house and the wooded buffers between their yards. Setbacks follow no fixed pattern, as buildings sit where they will be the least intrusive upon the natural features. In some cases garages are located close to the roadway, with homes tucked behind them on higher ground. The roads wind through the woods with more regard paid to minimizing site disturbance than to conforming to a highway engineer's manual (which is the basis for most subdivision road design standards). All utilities have been installed underground, and just enough woodland has been cleared to accommodate the 18-foot-wide access road network (with minimal shoulders). All homes are served by public water.



Figures 1 and 2: As seen in the site plan of Long Hill Farm, all homes back up to open space, woodlands in the center and old pastures in the western half. The Barn condos are located in the western end of the property. The entrance, from Long Hill Road, traverses a field before entering the woodlands, which screen all homes from the public road. Note that this street is paved at an 18-foot width, similar to the pre-existing public road bordering the property (Long Hill Road). Source: Randall Arendt

In addition, 35 multi-family condominium units were built in several barn-like structures at the western end of the site. Garages and storage lofts are contained in smaller barn-type structures within the "compound." Designed to blend in with vernacular building patterns, the barns received an award from the Guilford Preservation Alliance, which recognized them as a "much-needed demonstration that multi-unit developments can be designed to harmonize with older neighborhoods and the rural countryside."

Figures 3 and 4: Rear patios look out onto large areas of open space, beginning at the edges of their modest back yards. Nearly all the homes enjoy long views onto permanently preserved open space, such as this meadow. Note that some rear lot lines follow old stone walls, a feature that the site designer took care to utilize and preserve, thereby adding value to the development. Source: Randall Arendt

The location, shape, and size of the preserved open space were some of the major design determinants for the development layout. The reason was not primarily aesthetic or recreational, but pragmatic: septic systems had to be placed on the best soils available on the site. This meant siting eight subsurface drainage areas in the meadows, while occasionally building homes on solid ledges. Many of them have been oriented to take full advantage of

long views across the protected open fields, a feature typically not possible in conventional "checkerboard" subdivisions.

Figures 5 and 6:: Septic system drainfields serving small groups of homes are located under former pastures such as this one, where the most suitable soils on the property were found to exist. Identifying such areas for wastewater disposal, which comprise part of the development's open space network, is one of the first steps in conservation subdivision design in unsewered areas. Homes are then situated around the conservation land so that all units can be easily connected to these underground utility systems. On the right, traffic speeds are reduced by this small landscaped island. Source: Randall Arendt

D7. STRATHMORE FARMS, CONNECTICUT

Strathmore Farms: Hamlet framed by "Foreground Meadow"
Location: River Road, Madison, Connecticut
Development Period: 1986-1992
Site Designer: Eric Anderson Associates, Guilford, Connecticut
Developer: Robert Dowler, Madison, Connecticut

Six acres of horse pasture separate Strathmore Farms' 24 single-family homes from River Road, helping to preserve the rural character of this country road and providing a visual and recreational amenity that would not have been possible had the developer chosen to subdivide his 29-acre parcel into a conventional checkerboard pattern of house lots and streets. With about 14 acres of dry upland, the residential density is roughly 1.75 dwellings per developable acre, and the percentage of upland open space is 42 percent.

Fig. 1. The aerial photo clearly shows how the 300-foot deep "foreground meadow" buffers the homes in Strathmore Farms from River Road (and vice versa). All homes enjoy long views either over that meadow or the marshes along the Hammonassett River. Source; Google Earth

Most of the homes also enjoy attractive views toward a tidal marsh along the Hammonasset River, bordering the property to the east. A short boardwalk (175-feet long) leads to a gazebo built at the river's edge, affording views up and down the meandering estuary. A small private dock at this location provides access to the river and to Long Island Sound, one mile downstream. Located 45 minutes from Hartford, Madison is also a two-hour drive from both New York City and Boston.

Within the site, homes are generally located 40 to 45 feet apart (from side to side) and typically sit about 20 feet from the edge of the roadway, which itself has a paved width of 18 feet, helping to create the feeling of an informal rural neighborhood. All the land is commonly owned in this condominium development, but if individual lot lines existed, each home would sit on a lot of about 10,000 to 12,000 square feet. Half the homeowners are "empty-nesters," and half have children ranging in age from one to eighteen.

Figures 2 and 3. View from River Road (left), and the "foreground meadow" as seen from the entryway that crosses it. Off-lot individual septic system drainfields are located under this part of the open space. The homeowner association is responsible for drainfield maintenance, and for periodic pumping of the septic tanks located on each houselot, a practice that extends drainfield life. Source: Randall Arendt

Although this village-scale arrangement was very unusual in its time for new large-home developments in rural New England in this price range (about $430,000 to $640,000 in 1992 money), units sold quickly and turnover has been very low. Homes come in four traditional architectural styles and range in size from 2,700 SF to 4,900 SF. Homes are served by town water and by individual septic systems located within the common open space shown in Figure 3, and are maintained by a homeowners' association.

Figures 4 and 5. In a traditional hamlet fashion, the fronts of homes face each other about 50 feet apart, across a street that is 18 feet in width. Fourteen of the 24 homes look out over the river marshes. Source: Randall Arendt

D8. PARK AT WOLF BRANCH OAKS, FLORIDA

The Park at Wolf Branch Oaks: Designing Around 13 Acres of Mature Live Oaks
Location: Wolf Branch Road, Lake County, FL
Developer: Dr. Eric Coe, Leesburg, FL
Site Designer: Randall Arendt, FRTPI, Brunswick Maine
Development Period: 1998 to 2003

The genesis of this rural neighborhood design was a one-day conference convened by Lake County officials and planning staff, who wanted to expose local landowners, developers, and engineers to two complementary approaches to land-use planning: the New Urbanism for areas in and adjacent to towns, and conservation subdivision design for properties in outlying areas zoned for suburban development.

Following presentations by Andres Duany and the site designer, the owner of a rural property located four miles east of Mt. Dora asked me to walk his land and help him devise a sensitive plan that would preserve its beautiful natural features: the dozens of large live oak trees that populated this otherwise open, relatively flat, 116-acre cow pasture.

After walking the site and examining an aerial photo to locate the most outstanding trees and tree groups, the need to create a central park became clear. As the principal natural feature of the property, it was decided to encircle it with a street, ensuring its high visibility. Other trees were similarly designed around and conserved, adding further value and market appeal to the layout. In some cases, a large tree or small group became "terminal vistas" on sensitively aligned and curved streets. This park has become a popular place for residents to walk and relax, and is shared by sandhill cranes who visit regularly, as well as other suburban wildlife.

Figures 1 and 2: A four-rail fence runs along Wolf Branch Road and the edge of the foreground meadow, adding to the neighborhood's rural character. The concept plan shows how the site's most significant value-adding trees were designed around, and how the view from Wolf Branch Road was respected by creating a 300-foot deep buffer and facing 18 homes

In addition, the land closest to Wolf Branch Road was designated as an open space buffer where stormwater could be directed for on-site infiltration and recharge. This 300-foot deep open area,

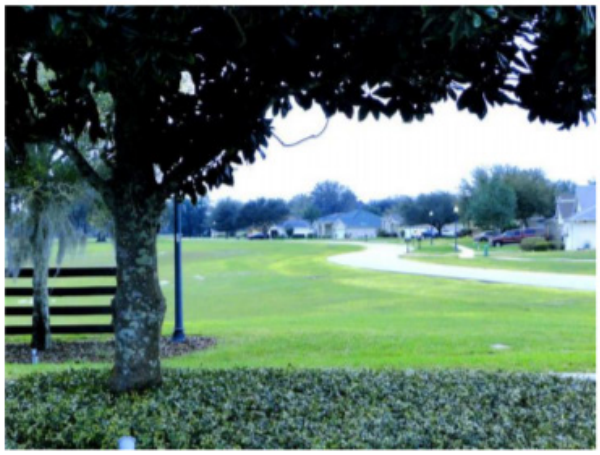
Figures 3 and 4: Part of the central park and several homes facing it from across the street that encircles it can be seen in the photo (right). Sandhill cranes are frequent visitors to the central park (right). Source: Randall Arendt

known as a "foreground meadow" (see Figure 3), also buffers the homes from passing traffic and provides a greater degree of seclusion and privacy as well. The design decision was taken to orient homes to face Wolf Branch Road, maximizing backyard privacy and creating a more appealing public viewshed. In other words, the typical "fanny-first" design, where developers back homes up to public roads, was intentionally rejected. That design approach was also avoided around the central park, which most developers would have encircled with backyards.

Figure 5: The aerial photo shows how faithful the final engineered design is to the original sketch (seen in Fig.1). One reason is that beginning the design process by defining the value-adding greenspace helped the developer gain county approval, as the layout was consistent with county planning policies for protecting rural character and replenishing aquifers through upland open space, a critically important way of recharging groundwater resources. Source: Google Earth

After rezoning from more rural multi-acre density to a density of one acre per dwelling, the property was permitted to have 116 house lots, which were allowed to range in area from

12,000 to 30,000 sq. ft., with a minimum width of 80 feet – reductions that enabled the developer to surpass the basic 50 percent open space requirement. Approximately half of the lots enjoy open space views both front and back, while the others either face onto open space or back up to it. Water supply is provided through a private central system on the property, and wastewater is treated in septic drainfields on each lot. Street pavement width requirements were reduced to 18 feet (16 feet for the entranceway), without curbing. Stormwater is handled through grassy swales alongside the streets, which works well as the property is underlain by permeable sandy soils.



Figures 6 and 7: The 300-foot deep "foreground meadow as seen from Wolf Branch Road (left), and as seen from the first street in the neighborhood. Besides protecting rural character, this buffer significantly lessens traffic noise from the public road, which has become significantly more busy as development occurs on other properties in the area. Source: Randall Arendt

Approvals were issued after a relatively brief and uncomplicated review process, as county staff and officials wanted to encourage this form of development, as it furthered their Comprehensive Plan's open space and rural character objectives. Fortunately, the project engineer and landscape architect completely understood the design goals established in the conceptual planning stage, further helping the process run smoothly.

This sensitive neighborhood design quickly became popular in the marketplace, appealing to consumers who wanted to live in pleasant, semi-rural surroundings not far from town with its shops, services, and jobs, and has been continuously cited by county staff and officials as an outstanding example of conservation design for others to emulate.

Figure 8: Another view of the development from Wolf Branch Road showing homes facing onto the meadow and toward the front edge of the property, which is bordered with a four-rail fence. Developers can afford to leave one side of an interior street open by using the clustering principle to reallocate density to other parts of the neighborhood. Source: Randall Arendt

D9. EAST LAKE COMMONS, GEORGIA

East Lake Commons: A Pedestrian Village and Organic Farm
Location: Off 2nd Avenue SE, Atlanta, GA
Site Designer: Greg Ramsey, Village Habitat Design, Atlanta, GA
Developer: East Lake Commons, Inc., Atlanta, GA
Development Period: 1998 - 2000

Situated three miles from downtown Atlanta, on a former brownfield site strewn with old tires, in a low income neighborhood of Dekalb County, Georgia, East Lake Commons successfully demonstrates that residential development of a blend of market-rate and subsidized homes can be accomplished in a socially, ecologically, and economically sustainable manner. Many of the homes were designed to accommodate accessory dwelling units in their basements. This project brought the first new home construction in a decade to the East Lake district, which had suffered from red-lining policies by lending institutions since the 1960s.

Originally zoned for 35 low density duplexes (containing 70 dwelling units), planning permission was granted to develop 67 fee-simple townhomes of varying sizes on just eight of the parcel's 21 acres, with three acres of driveways and parking, so the remaining ten acres could be set aside as permanent open space. Jointly held by the 67 homeowners, this conservation land includes four acres managed as an organic farm with row crops, private garden plots, stormwater pre-treatment, an orchard, a greenhouse and pond, plus a playing field, woodland areas, a wildlife corridor, and stream buffers. The garden is operated as a CSA (Community-Supported Agriculture), with members receiving (and sometimes picking) a variety of organic vegetables, fruits, herbs and flowers throughout the growing season. Membership is available to the wider East Lake neighborhood, and area residents are encouraged to join. Surplus produce is sold by the farmer at a local farmers' market and to local restaurants, with weekly food donations given to a homeless shelter.

Homes are arranged along internal footpaths (ten feet wide and paved to serve as fire lanes) and typically back up either to the surrounding open space or to interior greens. Parking is located on one side of the village near the public roadway along the property boundary, so the neighborhood can remain car-free, quiet, and safe for children. As noted by the site designer, "the distance from the parking area to the furthest home is less than the length of an average supermarket parking lot, and hand carts are provided for residents to use to carry their shopping bags to their homes." (email from Clayton Preston).

Figure 20-8.1: Homes front onto car-free pedestrian areas and generally back up to open space, with parking provided in several perimeter locations. Townhouse design enabled the 67 homes to be compactly grouped, saving half the site as permanent open space, including both recreation areas and cropland. Source: Village Habitat Design

Home occupations and home offices are encouraged, as they reduce commuting and increase social interactions during the day. The design encourages residents to walk and bike in safe areas away from vehicular traffic, and provides easy access to local public transportation. "Lease-on-demand" vehicles are also available to residents by the hour.

A large (6,200 SF) common house, with a kitchen, dining area, meeting rooms, and guest rooms, is used for twice-weekly community meals, meetings, social events and overnight accommodation. Its small library, play areas, laundry facilities and classrooms provide further amenities for residents that make smaller, less expensive individual homes possible. Summer camp activities are held for both the children living in East Lake Commons and for those in the surrounding neighborhood. At their fortnightly meetings, residents make decisions on a consensual basis rather than by a majority vote. Activities such as landscaping, cleaning of the common room and production of the newsletter are resident responsibilities.

Figure 20-8.2: A variety of architectural designs maintains visual interest along the pedestrian "streetscape". Four acres are cultivated organically by a CSA (community assisted agriculture) group. Source: Village Habitat Design

East Lake Commons Inc., a not-for-profit company created and financed by the original landowner, developed the project. It was designed by Greg Ramsey collaboratively with the developer and the community's founding members, and according to the social and ecological principles espoused by George Ramsey, professor of architecture at the Georgia Institute of Technology. Homeowner participation ensured that the end results reflected a broad range of perspectives and met a variety of user needs. Virtually pre-sold before completion, East Lake Commons remains a very popular community, where homes are often sold by word-of-mouth to buyers on waiting lists.

The village has been designed on wheelchair 'visitability' principles, with each home having stepless entrances and generous circulation space on the ground floor.

Stormwater volume is cut by reducing the length and width of paved streets, with runoff directed into a boggy retention wetland for filtration and cooling. It then flows into a pond used for recreation, garden irrigation, and wildlife. Excess water is released from the pond into a stream.

East Lake Commons received the United Nations' Habitat Division World Habitat Award in 2000 and the American Institute of Architects / Housing and Urban Development Secretary's Award for mixed-use and mixed income development in 2001. It also received the 2000 Annual World Habitat Awards of the Building and Social Housing Foundation of Leicestershire, England.

A primer or pattern book for development such as East Lake Commons (Preston and Ramsey, 1999) has been produced by Village Habitat Design of Atlanta.

Fig. 20-8.3. Ten of the 21 acres comprising this suburban infill site have been preserved as open space, including a pond, village green and two organic gardening areas.

D10. THE FIELDS OF ST. CROIX, MINNESOTA

The Fields of St. Croix: Preserving Farmland, Restoring Prairie, and Rescuing a Barn
Location: Lake Elmo, Minnesota
Development Period: 1997-2000
Site Designer: Robert Engstrom
Developer: Robert Engstrom Companies, Minneapolis, Minnesota

The Fields of St. Croix is an outstanding example of conservation subdivision design. Situated in the City of Lake Elmo (population 8,069), about 12 miles northeast of the center of St. Paul, it has preserved more than 60 percent of its 241 acres. This open space includes several neighborhood greens, playing fields, two ponds, cropland, a nursery with native grasses and wildflowers, a restored prairie, and wooded hillsides.

Although the site's acreage would have yielded only 24 lots in a conventional layout under the existing ordinances (with a base density of ten acres per house), the final approved plan allowed 113 homes, including 14 attached twin-homes. The increased density was achieved partly by bonuses for amenities and design features. Elsewhere in the city, base densities were changed to permit six dwellings per 20 acres (or about 3.5 acres/dwelling).

In addition to conserving natural resources, the public viewshed from Rt. 5 has been respected, with rural views of open farmland along the eastern edge of the site. Homes are sited toward the center of the parcel, away from highway noise and nearer to the woods, ponds, and the large prairie restoration area on the western third of the site.

Figure 21-15.1: On this site plan of phase one, a line of trees and farmland on the east buffer homes from Route 5, while preserved woodlands and restored prairie lie to the west of the developed area. The majority of homes face inward to neighborhood greens and back up to open space as well. The photo captures the rural view from Route 5: cornfields, with homes in the distance. Sources: Arendt 1999 and Natural Lands Trust. RA photo

This conservation neighborhood was designed according to the city's relatively new open space development ordinance, the impetus for which was the applicant's progressive concept plan. To achieve his open space objectives, which add value to the project, the developer needed more design flexibility than was allowed under then-current regulations. At the same time, municipal officials saw this as an opportunity to update their development standards to allow this improved design approach. Among the numerous positive results of this site design and the new ordinance that was subsequently adopted is that the city's zoning now allows conservation design standards to 4,400 acres (almost seven square miles) of semi-rural land within its jurisdiction.

The ordinance's 50 percent density incentive successfully encouraged the provision of community greens and trails, as well as the preservation of historic structures. In addition to the unusual environmental features noted below, the design includes miles of paved multi-use trails and a central park large enough to accommodate natural areas, neighborhood play activities, and a tot lot. Sales were

Figure 21-15.2: Neighborhood greens feature a variety of amenities from playground equipment to purple martin bird houses. The paved trails are ideal for cycling, jogging, and rollerblading. (RA both)

extremely strong, with 80 percent of the 45 home sites in Phase One selling within the first six months. (Sparks, 1998). Lots vary in size from 10,800 square feet to 2.3 acres and range in price from $44,500 to $175,000. The most expensive were those backing up to the wooded hillside overlooking the two ponds and principal prairie restoration areas.

Among the notable aspects of this site design, several are exemplary:

Forty acres of land has been restored to its original prairie habitat with native grasses and wildflowers, plus ornamental grasses and perennial flowers, many of which were raised by the developer in a nursery he created on his property.

Figure 21-15.3: Approximately 30 acres of land have been restored to their original prairie vegetation (left) using native grasses and wildflowers propagated at the developer's own private nursery. Such plantings are also used for roadside landscapes as well (right). (RA both)

Forty acres of productive farmland remain actively cropped. Although only a small part of the original cropland, this acreage has proven ideal for a new kind of "metro farmer" tilling the land and adapting to changing circumstances in an increasingly suburban location. Continued production of traditional row crops such as corn and soybeans provide sufficient revenue to

pay taxes and a small yearly return. More productive uses of the land have included specialty horticulture, tree and shrub nurseries, and "community supported agriculture" (CSA). Natural Harvest, a CSA organization, produced organically grown vegetables and flowers for its members between 1997 and 2004, including residents and other townspeople. Additional produce was sold to nearby restaurants.

Figure 21-15.4: Fresh vegetables, fruit, flowers, and herbs for sale at the farmstand featuring produce grown on the property. Source: Robert Engstrom

State-of-the-art constructed wetlands technology for treating wastewater, with fully treated effluent discharged into the ground to replenish the underlying aquifer. Wastewater first enters standard septic tanks and the liquid effluent flows into a primary treatment cell lined with polyethylene and filled with rocks which host bacteria that consumes waste materials in the effluent. The cell is covered with mulch to provide rooting material for wetland plants and to insulate the wastewater from cold winter temperatures. Treated wastewater then flows into an unlined cell located on permeable soil where it percolates back into the ground.

This wastewater approach removes greater amounts of nitrogen and phosphorus than conventional mechanical systems or standard septic systems. Because of their smaller size, ease of replacement and greater design flexibility, constructed wetland systems are becoming the system of choice in many developments built under the city's new open space ordinance. The system at The Fields was the first one in the state licensed by the Minnesota Pollution Control Authority.

Stormwater management is designed to handle nearly all precipitation on site through retention, evaporation, and infiltration.

Restoration of a Civil War-era barn as a community center for residents which is occasionally available for others, such as local conservation groups, to use. All the common open space and the restored barn are owned by the community association. The non-common open space encompasses the tilled fields, but both types of conservation land are permanently protected through easements held by the Minnesota Land Trust.

Community streetscape and safety enhanced by reduced public street standards permitting street widths of 14, 16, and 18 feet.
Distinctive homes of stylized craftsman or prairie architecture built according to EPA Energy Star

standards to be energy-efficient.

Figure 21-15.5: Some of the neighborhood greens contain water features such as this pond (left). A 150-year old barn (right) has been converted to a community center. (RA both)

As a point of interest, during the Great Recession, marked by a large volume of foreclosures and falling property values in the Twin Cities metro area, no foreclosures occurred at the Fields, and residential property values held up surprisingly well (email from Robert Engstrom 10.12.11). Notably, this project received the 1998 Land Use and Community Award from the Minnesota Environmental Initiative.

D11. RADBURN, NEW JERSEY

Radburn A Transit-Oriented, Pedestrian-Friendly, Mixed-Use Community in a Parklike Setting
Location: Fairlawn, NJ
Development Period: 1927-31
Site Designers/Architects: Clarence Stein and Henry Wright
Developer: City Housing Corporation, New York, NY

Well-known to students of town planning in the United States, Canada, and Britain, Radburn and its historic lessons remain widely unknown and unappreciated by most developers and local officials. Originally conceived as a way of providing safe, attractive, and enjoyable neighborhoods for families of very modest means, in a layout where meandering parkland gives a most pleasant form to this remarkable community, Radburn was based upon the simple principle of separating vehicular traffic and pedestrians, and continues to provide an enduring model for advocates of the "safe routes to school" philosophy.

As noted by Stein, conventional grids where all streets are through-streets create the possibility for pedestrian vehicle accidents every several hundred feet. Accordingly, faster-moving through-traffic is routed around the residential area on landscaped boulevards aligned with the topography and forming a looser grid of larger "superblocks'' encompassing 35 to 50 acres accessed by quiet back lanes or alleys. (By contrast, conventional gridded blocks measuring

300 by 600 feet encompass about five acres.) The short cul-de-sacs (300-400 feet in length) are designed as back lanes to access rear garages. Most homes face each other across footpaths, with about 90 feet between opposing front doors.

Figure 20-1.1: This detail of the southwestern section of the original Radburn plan shows the train station and mixed-use center in the lower left corner and the elementary shool and pool in the upper right. The birdseye sketch, by Ross Chapin, shows how homes relate to the long, curving fingers of parkland that connect all parts of the community with pedestrian walkways. Sources: Stein 1957 (MIT Press) left, Chapin 2011 (Taunton Press) right

The two superblocks contain about a dozen pocket neighborhoods with 15 or so homes in each, and are considerably larger than those created by Unwin and Parker in the English Garden suburbs of Letchworth and Hamsptead two decades earlier, in order to create a more meaningful internal park system, which is the community's pride and joy. (Stein and Wright toured both garden suburbs in 1924 with Unwin, who became an informal advisor to the Radburn design team.) Keeping through-traffic out of neighborhoods by bordering them with higher-order streets was a key principle of another visionary planner named Clarence Perry, a contemporary of Stein and Wright. Perry's design for a prototypical neighborhood unit emphasizing central school locations and a system of parks clearly influenced certain aspects of the Radburn layout.

An extensive network of sidewalks and footpaths (totaling more than four miles on this 149-acre site) connects each house with several long, serpentine parks covering 23 acres, and leads to the neighborhood school, playing fields, and community pool at one end of the development, and to a commuter rail station, shops, and offices at the other. Other recreational facilities include two tot lots, two playgrounds, three ballfields, and four tennis courts. Compactly built for pedestrians, no home is farther than 400 feet from the central parks or from the boulevards bounding the superblocks. The original plan, never fully realized due to the Great Depression, encompassed more than 1,000 acres, with homes for 25,000 residents, and would have linked the community to a new riparian park along Saddle River.

Figure 20-1.2: Offices are located above retail and services in the original mixed-use center, which interfaces with the rest of Fairlawn Borough. Road overpasses allow children to cross safely underneath principal streets, as they walk or bike to school, shops, or the community pool. (RA both)

Pedestrian underpasses allow children to safely walk, run or bike through what would otherwise be dangerous intersections with major thoroughfares. Although the site was no more than a spinach field in 1928, extensive shade-tree plantings of native species have made it a veritable forest today. The back lanes are approximately 400 feet in length, and deliberately terminate in cul-de-sac turnarounds in order to maintain the integrity of the two central parks, which would otherwise have been cut into small pieces by through-streets forming a needlessly denser grid. These alley cul-de-sacs also provide convenient pedestrian access to the parkland beyond. The underlying philosophy was to design vehicular access ways that serve, rather than dominate, the community (Girling and Helphand, 1994). According to Stein, the designers' goal was "to create a town where people could live peacefully with the automobile – or in spite of it" (Stein, 1957).

As landscape architect and team member Marjorie Cautley observed, "One cannot understand Radburn without walking through it. One felicitous byproduct of designing primarily for people rather than for cars is that Radburn's layout reduced land coverage by streets from the then-current 35 percent (for similar densities) to 21 percent. Significantly, street paving and utility runs were reduced by 25 percent, compared with conventional gridded layouts, and these savings, instead of being pocketed by the developer, paid for the construction of the two large greenway parks (Southworth and Ben-Joseph, 2003). This lovely community park system has boosted real estate values for eight decades because it increases livability. Remarkably, a 1970 study by John Lansing of the University of Michigan found that 47 percent of Radburn residents shopped for groceries on foot, compared with 23 percent in Reston and 8 percent in conventional neighborhoods (quoted in Birch, Eugenie, 1980, online at http://repository.upenn.edu/cplan_papers/31/). Lansing also documented lower vehicle miles traveled by Radburn residents, compared with other communities.

Figure 20-1.3: With its parkland bordered by homes, Radburn has the feeling of a "golf course development without the golf course". Its extensive footpath network is used by residents of all ages, such as this granddad and grandson wheeling their grocery purchases home from the local market. (RA both)

Radburn's population of about 3,100 lives in a mixture of 469 detached dwellings, 30 semi detached ("duplex") houses, 48 townhouse units, and a 93-unit apartment complex. The single-family models are sited on lots typically measuring 50 by 100 feet (at a net density of eight units per acre), but this is balanced by the large amount of high quality open space within a short walking distance of every residence. The apartments are in three-story brick structures located in gateway fashion at the ends of the street separating the two superblocks, near the mixed use center. Overall, the gross density is approximately five units per acre. According to an Urban Land Institute study, Radburn's "walk layout, the orientation of home sites toward cul-de-sacs, and its internal parks increase the frequency of personal interactions within the development. The result is a cohesive community with a high level of participation in association affairs" (Hanke 1973).

Radburn's lifestyle is so incredibly appealing that it is able to boast a number of second-generation residents, who grew up there and moved back as adults, so their children could enjoy the same pleasures and benefits. The essential secret of Radburn is that it is truly "a subdivision within a park." Its attractiveness, however, has had the unfortunate effect of elevating property values to levels higher than the moderate-income families, for which the development was originally intended, can afford. Despite their small lots, Radburn homes are much in demand by young professional couples who enjoy living in a remarkable parklike setting. As described by Geddes Smith in 1929, at Radburn "roads and parks fit together like fingers of your left and right hands, and children need not dodge motor-trucks on their way to school" (quoted in Southworth, 2003).

And as Lewis Mumford observed in his introduction to Stein's classic Toward New Towns for America, "What Stein and Wright demonstrated are not forms to be copied, but a spirit to be assimilated and carried further, a method of integration to be perfected, a body of tradition to be modified, and transmitted, -- and in time transmuted into new forms reflecting the needs, desires, and hopes of a different age."

Fig. 20-1.4. Radburn (left) has been emulated many times, but perhaps never equaled. Good examples can be found at Lake Vista in New Orleans dating from the late 1930s (middle) and Wildwood Park in Winnipeg, Manitoba, designed in 1946 (right). Another related example is Greendale WI, described in Chapter 8.

D12. RINGFIELD, PENNSYLVANIA

Ringfield: Homes Set among Woodlands, Meadows, and Ponds
Location: Ring Road, Chadds Ford Township, Delaware County, Pennsylvania Developer: Richard Chalfant, Wilmington, Delaware
Site Designer: : Richard Chalfant, Wilmington, Delaware
Development Period: 1977-86

Approximately 56 acres (or 74 percent) of this 76-acre site have been preserved as open meadows and natural woodlands. An informal network of woodland trails links the various neighborhood areas with three ponds, and consideration is currently being given to supplementing this system with additional trails mown across or around several of the wildflower meadows to offer more diverse walking choices for the residents.

Figure 1: Ringfield's site plan clearly shows the location of homes in relation to meadows, woodlands, and ponds, as well as the off-lot community wells and shared septic drainfields. (*Source*: Natural Lands Trust)

The township's Planned Residential District allowed the developer to achieve full density (38 dwellings, at the two-acre standard) and wisely did not impose any restrictions on lot size, width, or street frontage. This flexibility permitted the site designer wide latitude in fitting six condominium units, six attached townhouses, and 26 detached homes into the landscape and the topography to take full advantage of views and sunlight. The homes in Ringfield occupy quarter-acre lots, all of which both face and back up to permanent open space. Lots for the detached homes, which are designed in groups of three and are separated by open space, are large enough to suit the owners' needs partly because most of them were developed without suburban front lawns (see Figure 1). Because homes back up to preserved open space, lot

depth as seen from the rear window appears greater than it actually is. Homes are situated at modest setbacks from the street, with dooryard gardens or informally landscaped areas instead of grassy yards. Homes in Ringfield range in floorspace from 2,700 to 3,600 square feet. The two three-unit townhouses, situated on 12 acres toward the front of the property, are fairly commodious at 2,000 square feet, with two full baths. (They date from Ringfield's first phase, and were an experiment in condominium living, a new concept for the area at that time, and have their own owners' association.)

With meadowland, dogwood trees, and a pond occupying the public viewshed along Ring Road, the layout of the neighborhood helps to preserve the township's rural character. Also facing Ring Road is the original stone farmhouse, situated on a separate multi-acre lot. Of the 64 acres occupied by Ringfield's second phase, 34 remain in woodland and 12.5 acres are occupied by meadow.

Figure __: One of the everyday delights of living in Ringfield is the enjoyment of rural views consisting of woodlands, ponds, and meadows. (Photo courgtesy of Holly Harper).

Homes are served by six deep wells, each supplying three to nine dwellings. Only minimal treatment is needed for softening, controlling pH, and iron filtering, and annual testing is performed by an independent lab. The six wells and 17 septic drainage fields (each serving one to six homes) are located in the common open space. Although shared drain fields were preferred for practical reasons, two homes are served by their own individual fields in the common open space, due to topography and the need to design drain pipes for gravity flow.

To ensure longer life and smoother operations, accumulated solids are removed from the septic tanks by the homeowner association on a regular schedule consistent with state requirements, a practice that should be followed in all subdivisions where septic systems are used. Effluent from most of the septic tanks flows by gravity to the drainfields, but in several cases pumping is required, with twin pumps running sequentially, an approach that extends their lives and provides an emergency pump in the event one should require repair. Recently the HOA has begun installing filters to screen all solids from flowing into the drainfields, extending their

useful lives.. (These filters are cleaned quarterly.)

In addition to providing wildlife habitat, the three excavated ponds provide areas for quiet contemplation. As they are located mainly within the common open space, they are accessible to all neighborhood residents and are also protected from woodland clearing, lawn extensions, and other typical suburban encroachments that would diminish their water quality.

Resident volunteers have created meandering trails across meadows and through those parts of the woodlands not encumbered by invasive vines. The meadow sections are mown regularly in the growing season by crews hired to cut the lawns, and trails on adjacent properties lead to publicly-accessible paths along the Brandywine River. Because traffic volume is very low, and travel speeds are only moderate, Ringfield's private streets offer another popular place for strolling or walking dogs.

Maintaining the open space has become an increasing challenge, due to the explosion of invasive plants and vines in the region over the past four decades, and the rising deer population. The HOA has striven to raise awareness of the need to actively manage the conservation land, and to allocate a greater proportion of the annual dues to that task.

Figure : The conservation meadows at Ringfield, which are covered with russet-colored broomsedge (*Andropogon virginicus)* in the autumn, require minimal maintenance, offer habitat variety, and provide convenient areas for subsurface sewage disposal in off-lot systems.

Figure : The public viewshed, as seen from Ring Road, has been carefully preserved, and enhanced with a small pond alongside the entry drive (left). Streets within Ringfield are bordered by meadows, hedgerows, or woodlands (right and below). (Photo below courtesy of Holly Harper).

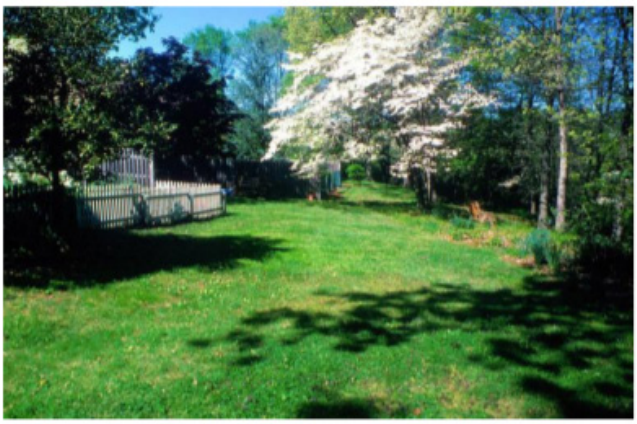


Figure : All homes back up to open space, some of them overlooking the ponds, which are surrounded by protected common land that buffers their water quality, and allows access by all residents. Views into one of the two meadows contribute to the neighborhood's distinctive rural character. (Top photo courtesy of Holly Harper)

Figure __: Open space views at Ringfield vary with the time of day, season, and weather conditions, and the beauty inherent in the changing landscape scene benefits both residents and visitors many subtle ways. (Photos courtesy of Holly Harper, RLA).

D13. SPRING VIEW FARMS, UTAH

Spring View Farms: Completing a Regional Trail with Greenway Subdivision Conservation Land
Location: 1120 West and 14600 South, Bluffdale, Utah
Site Designers: CW Management Corporation, West Jordan Utah and Think Architecture, Salt Lake City, Utah
Developer: CW Management Corporation, West Jordan, UT
Dates: 2002- ongoing

An excellent example of using subdivision design to help complete greenway networks is Spring View Farms in Bluffdale, Utah (population 7,975). Nearly 60 percent (150 acres) of this 258-acre development's area has been preserved as permanent open space for wildlife habitat and active recreation. Approved in 2003, its 4.5-mile paved multi-use trail for strolling, jogging and cycling completed one of the last segments of the 40-mile Lake-to-Lake Trail connecting Utah Lake with Salt Lake, a project that was decades in the planning.

Figure 1: The layout of Spring View Farms (left) is dominated by the greenway park that runs through its middle, along the Jordan River Valley View from the five-acre municipal park on the property's highest point encompass the boulevard parkway at the bottom, the greenway park beyond the white fence, and the snow-capped Oquirrh Mountains in the background. (Source: CW Management Corporation) Source: CW Management Corporation (left), and Randall Arendt (right)

The open space network encompasses but is not limited to about 1.5 miles of river corridor, wetlands, and other environmentally sensitive features. Natural riparian edges were carefully preserved and habitat was augmented with six ponds and several other water features. This project is a fine example of greenway planning benefitting residents and the wider community, in addition to being profitable to the developer, epitomizing the "twice green" concept (green both environmentally and economically).

These positive results were made possible through clustering provisions, supplemented with bond money and private funds to preserve more land than what the ordinance could protect by granting a 35 percent density bonus in this one-acre zoning district, and by allowing homes to be built at about three to the acre (307 lots located on approximately 110 acres – in addition to the 150-acre preservation area).

Among the notable neighborhood design elements is the 1,500-foot entrance boulevard (Spring View Parkway) which is bordered by conservation land on its entire western edge, emphasizing the open space character of this neighborhood from the moment one first enters it. Two street intersections are graced with landscaped roundabouts, and shade trees are planted between sidewalks and curbs along every street. Numerous trail heads provide easy access for neighborhood residents, and a parking area with toilet facilities at the public trailhead a few blocks away provides convenient access to the general public, who are welcome to use the development's interior trail loops in addition to the Jordan River Trail spine.

Figure 2: About 40 of the homes back up directly to the parkland open space, ten of which are located relatively close to the public trail. Spring View Parkway, the main entrance street, runs alongside the parkland for more than one-third of mile, providing open space views instead of a line of houses and driveways. Source: Randall Arendt

Salt Lake County agreed to accept the vast majority of the conservation lands, incorporating them into its park system. (A map of the entire Jordan River Parkway, including the southernmost segment containing Spring View Farms, is downloadable at http://parks.slco.org/jordanRiverParkway/index.html) The county also purchased a section of the subdivision with river frontage with bond money to increase the amount of open space being preserved.

The city accepted a five acre parcel on the property's highest point, which the developer transformed into a municipal park. With children's playground equipment, a picnic pavilion, and informal seating areas, this small park provides long vistas over the Jordan River Valley, and an excellent view of the greenway park. The homeowner association mows the grassy areas within the development (mostly roadside verges and the boulevard median).

Fig 3: On the left, the Jordan River Trail passes between the river and one of six ponds created by the developer. It crosses the river on a bridge constructed by the county park department, providing views back into the development and up to the mountains (right). Source: Randall Arendt

The river and some of the ponds support small fish populations, attracting a modest number of fishermen. The range of wildlife is impressive, including elk, deer, bobcats, coyotes, foxes, pheasants, cranes, pelicans and a bald eagle, in addition to the more common Mallard ducks and Canada geese.

Figure 4. One of the loop trails created by the developer branches from the main spine (Jordan River Trail), connecting the parkland with several neighborhoods. These trails are also open to the public. The ponds provide habitat for mallard ducks,

APPENDIX E

ALTERNATIVE IMPLEMENTATION AND SUBMITTAL PRODECURES

There are several ways Hays County could implement a conservation design effort. For instance, as discussed earlier in this report, the planning team on the project considered a highly specific rewrite of Chapter 365 of the County's development rules, codifying in detail the application, review, and approval process. Instead, the team decided in favor of a more flexible approach, allowing both developers and the County to custom tailor agreements from a menu of best practices and incentives.

Given the limitations of county authority in Texas, the current development climate, the growth rate, the diverse geologic and cultural zones of the County, County staffing, and existing County customs, practices and expertise, the project's professional team recommends development agreements as the tool to implement conservation design. The team believes this approach provides the best opportunity for both parties to address the highly variable challenges of unique development sites across the diverse reaches of Hays County, fostering innovation and better incentivizing the use of conservation practices.

Under this recommended approach, the guidelines, goals, and incentives laid out in this report would become the foundation — a kind of catalyzing structure – for conservation development in the County. Final details and binding agreements would be worked out through highly individual development agreements. The public, landowners, developers, conservation advocates, and staff would all operate from the agreed set of goals and general incentive guidelines established in this report (or as amended and finally adopted by the Commissioners Court).

Conservation design would be an opt-in alternative that is permitted, and incentivized, under the rules. By working with the County through a legally-binding development agreement, developers would be eligible for substantial benefits under this opt-in approach, and at the same time would be responsible for developing in ways the County deems beneficial to the public, meeting standards that the County cannot require under existing state law. However, would-be

developers could also submit under the County's standard rules, ensuring them "development certainty" and a traditional path forward.

The County can formalize this approach relatively easily and quickly by amending the current development rules to remove references to the specific criteria for conservation development and replacing that with a reference to this report and its guidelines – or a similar set of guidelines adopted by the County Commissioners Court. Included in the Appendix is a sample brochure to help explain how an application for conservation development might work, an application checklist, examples of successful conservation development from around the state and nation, examples of best practices for design, low impact development, and a non-binding set of notions from team member Randall Arendt on what developers and County officials might consider when preparing and reviewing applications, particularly if the process becomes more routinized over time.

For now, as noted earlier, the recommendation is for applications to be processed as part of a development agreement. The team recommends that:

Applicants begin by using the interactive scoring matrix prepared as part of this project to gauge whether they are interested, and whether their project might qualify. (The County would need to make the matrix readily available on the County website.)
Applicants meet with County development staff and their County Commissioner to discuss the project before preparing detailed planning and engineering documents.
The County uses the same matrix to judge whether the development might qualify for incentives, and what type of incentives.
If both parties agree that the conservation development option is viable, then they enter into negotiations for a development agreement.

The findings and recommendations in this report apply only to the unincorporated areas of Hays County. It is recommended, however, that in the future the County coordinate as much as possible with cities to create a clear "conservation path" for developments within extra territorial jurisdictions and even, perhaps, within corporate limits – especially in those incorporated municipalities that rely on the County for development review and enforcement.

In addition, the team recommends that in the future the County implement a similar program for prospective developments that do not meet the conservation design standards laid out here, but that might nonetheless have important conservation opportunities and whose developers might be willing to try the kind of context-sensitive, "greenway" design identified and detailed in the charrette sections of this report – development that might not be "true" conservation design but would be greener and more oriented to conservation practices than "typical" subdivision development.

Finally, as noted elsewhere, it is important for this to be considered a "living document." If adopted, the recommendations contained in this report will need to be reviewed and refined after the County staff has developed experience with the guidelines, and as development practices – and pressures – in the County continue to evolve.

Section 1. General

1.1 Purposes

The purposes of Open Space Subdivision Design are to preserve agricultural and forestry lands, natural and cultural features, and rural community character that might be lost through conventional development approaches. To accomplish this goal, greater flexibility and creativity in the design of such developments is encouraged and required. Specific objectives are as follows:

- To preserve areas of Hay County with productive soils for continued agricultural and forestry use by preserving blocks of land large enough to allow for efficient operations.
- To reduce impervious cover and to increase opportunities for stormwater infiltration and recharge.
- To encourage the maintenance and enhancement of habitat for various forms of wildlife and to create new woodlands through natural succession and reforestation where appropriate.
- To minimize site disturbance and erosion through retention of existing vegetation and avoiding development on steep slopes.
- To preserve open land, including those areas containing unique and sensitive features such as natural areas and wildlife habitats, steep slopes, streams, wetlands, and floodplains.
- To preserve scenic views and elements of the County's rural character, and to minimize perceived density by minimizing views of new development from existing roads.
- To preserve and maintain historic and archaeological sites and structures that serve as significant visible reminders of the county's social and architectural history.
- To provide for the active and passive recreational needs of county residents, including Implementation of the County's Recreation & Parks Plan.
- To provide greater efficiency in the siting of services and infrastructure by reducing road length, utility runs, and the amount of paving for development.
- To create compact neighborhoods accessible to open space amenities and with a strong identity.

1.2 Applicability

Open Space Subdivision Design is permitted in all residential zoning districts. All Open Space Development subdivision plats shall comply with the requirements and standards specified herein and in all respects with other applicable codes and ordinances to the extent that they are not in conflict with these provisions.

Section 2. Open Space Standards

2.1 Minimum Required Open Space

In rural, unsewered areas, at least fifty percent (50%) of the unconstrained (buildable) land area in the Open Space Development shall be set aside as protected open space. In suburban, sewered areas, at least forty percent (40%) of the unconstrained (buildable) land area in the Open Space Development shall be set aside as protected open space. Unconstrained lands are lands that do not lie within "Primary Conservation Areas", as described below. Unconstrained lands also exclude

the rights-of-way of high-tension electrical transmission lines, and the rights-of-way of existing or proposed streets, which therefore may not be counted toward meeting minimum open space requirements.

2.2 Types of Open Space

The types of open space conserved through Open Space Development shall be consistent with the following standards:

a. Open space shall comprise two types of land: "Primary Conservation Areas" and "Secondary Conservation Areas", and shall be configured to create or maintain interconnected networks of conservation lands, to the greatest extent that is practicable.

b. Primary Conservation Areas form the core of the open space to be protected. They are the first type of open space to be designated on an Open Space Development Plan to satisfy the minimum open space requirement and consist of the following site features:

- Wetlands, including, but not limited to, streams, creeks, ponds, reservoirs, and adjoining land areas identified as part of: The National Wetlands Inventory maps prepared by the U.S. Fish and Wildlife Service; Soil maps published by the County; Soil Survey prepared by the U.S.D.A. Natural Resources Conservation U.S.D.A. Natural Resources Conservation Service (where "very poorly drained" soils can be considered as a proxy for wetlands); A required Environmental Assessment or Environmental Impact Statement; and/or; A site analysis conducted by a registered engineer, land surveyor, landscape architect, architect or land planner.
- Floodplains (100-year) and alluvial soils identified as part of: A Flood Insurance Study prepared by the Federal Emergency Management Agency (FEMA); and

The County Soil Survey prepared by the U.S.D.A. Natural Resources Conservation Service.

- Steep slopes, defined as those greater than 25 percent, identified as part of:

A County Soil Survey prepared by the U.S.D.A. Natural Resources Conservation Service; and/or

A site analysis conducted by a registered engineer, land surveyor, landscape architect, architect or land planner and calculated using topographic maps from an actual surveyor from the U.S. Geological Survey.

c. Secondary Conservation Areas consist of unconstrained land that would otherwise be suitable for building and include the following site features:

- Woodlands, including forest land for the planting and production of trees and timber, where management practices such as selective timber harvesting and wildlife enhancement are employed. Such woodlands may consist of hardwood, pine, and/or mixed pine-hardwood forests identified as part of: A site analysis conducted by a registered engineer, land surveyor, landscape architect, architect or land planner using aerial photographs and/or satellite imagery; A required Environmental Assessment or Environmental Impact Statement; and/or; An independent site study conducted by a trained botanist and/or forester.
- Farmland, whether actively used or not, including cropland, fields, pastures, and meadows.
- Natural areas, and wildlife habitats and corridors identified as part of:

An Inventory of Natural Areas and Wildlife Habitats as prepared by a state agency,

A required Environmental Assessment or Environmental Impact Statement; and/or

An independent site study conducted by a trained botanist and/or biologist.

- Slopes of 15% to 25% which require special site planning due to their erosion potential, limitations for septic tank nitrification fields, and terrain or elevation changes. Such areas may be suitable for building but higher site preparation and construction costs are to be expected.

• Historic and/or archaeological sites, including, but not limited to, sites listed on the National Register of Historic Places or included on the State's National Register study list, designated as a local historic landmark or district, and/or designated as having a high potential for archaeological remains. Such sites are generally identified as part of:

- A local architectural survey;
- A local archaeological survey;
- A required Environmental Assessment or;
- Environmental Impact Statement; and/or;
- An independent site study conducted by a trained architectural historian or archaeologist.

• Public and/or private recreation areas and facilities, including:

"Active recreation areas" such as public recreation areas, including district and community parks as identified in the County's Recreation and Parks Plan; and private recreation facilities, including golf courses, playing fields, playgrounds, swimming pools, and courts for tennis, basketball, volleyball, and similar sports, and commercial campgrounds.

Active recreation areas represent a kind of development in which natural lands are cleared, graded, and managed for intensive uses, thereby reducing the wildlife habitat or natural resource area that add to an area's ecological well-being.

For this reason, only half (50 percent) of the land in this category may be credited toward meeting the minimum open space requirement.

"Passive recreation areas" such as pedestrian, bicycle, and equestrian trails, picnic areas, community commons or greens, and similar kinds of areas, whether public or private. Land in this category receives full credit toward meeting the minimum open space requirement.

• Scenic views, especially of natural and cultural features from designated scenic road corridors, including "views from the' road" as well as views outward from potential home sites.

2.3 General Location Standards

A. Undivided Preserves. Both Primary and Secondary Conservation Areas shall be placed in undivided preserves which adjoin housing areas that have been designed more compactly to create larger conservation units than may be enjoyed by all residents of the subdivision. Such undivided open space shall be accessible to the largest number of lots within the development. To achieve this, the majority of house lots should be about undivided open space to provide residents with direct views and access. Safe and convenient pedestrian access to the open space from all adjoining house lots shall be provided, except in the case of farmland or other resource areas vulnerable to trampling damage or human disturbance.

Where undivided open space is designated as separate non-contiguous parcels, no parcel shall consist of less than three (3) acres in area, nor have a length-to-width ratio in excess of 4: 1, except such areas that are specifically designed for neighborhood commons or greens, playfields, buffers adjacent to wetlands and watercourses, wildlife corridors, or trail links.

Interconnected Open Space Network. As these standards are implemented, the protected open space in each new subdivision should be consciously designed to adjoin each other, and/or to other permanently protected lands, so that they may ultimately form an interconnected network of Primary and Secondary Conservation Areas across the county.

2.4 Ownership and Protection of Open Space

Conservation land within an Open Space Development may be owned and/or administered by any of the following methods, either individually or in combination. All open space shall be permanently restricted from further subdivision through permanent conservation easements recorded in the Hays County Registry of Deeds. These easements should be held by land trusts or conservation agencies of the state or local government, and are not recommended to be held by the elected officials of the county or municipality. Ownership options include:

- Fee simple dedication to Hays County, another unit of local government, the State of Texas or a private nonprofit land conservancy.
- Ownership by a homeowners' association where specific development restrictions and maintenance requirements are included as part of its bylaws. Such land shall also be protected through permanent conservation easements, as described below.
- Up to 15 percent of the conservation land within an Open Space Subdivision may be "non-common open space", that is designated for individual private ownership, such as by the original farmer or landowner, the developer, or another private entity that maintains the open space for the uses permitted in this ordinance (such as a nursery business or commercial equestrian operation). The remaining conservation land shall remain undivided for the enjoyment of the residents, and this remainder shall consist of land that is not wet or submerged, not steep (i.e., with slopes less than 25 percent), and not within the rights-of-way of high-tension electrical transmission lines.
- All conservation land shall be permanently protected through conservation easements dedicated to the County, another unit of local government, the State of Texas or a private non-profit land conservancy. Such easements shall apply to land owned by a homeowners' association, land within Conservancy Lots (beyond a two-acre "building envelope"), land owned by other private entities managing the land for open space purposes, and to land dedicated to units of government. (Land dedicated to units of local government shall be eased to a private land trust or conservancy organization because, over time, the conservation and development philosophies of elected officials could become subject to change.)

2.5 Maintenance of Open Space

Natural features shall be maintained in their natural condition, but may be modified to improve their appearance, functioning, or overall condition, as recommended by experts in the particular area being modified. Permitted modifications may include:

- Reforestation;
- Pasture or cropland management;
- Buffer area landscaping;
- Stream bank protection; and/or
- Wetlands management.

Unless accepted for dedication or otherwise agreed to by the County, another unit of local government, the State of Texas, or a private non-profit land conservancy, the cost and responsibility of maintaining open space and any facilities located thereon shall be borne by the property owner and/or homeowners' association.

Management Plans are required for all open space within Open Space subdivisions specifying who is responsible for which maintenance responsibilities, and on what schedule. Guidelines for management can be found in the Stewardship Handbook for Natural Lands, published by the Natural Lands Trust

Section 3. Design Standards

3.1 Two Options for Calculating Maximum Permitted Density

The maximum number of lots in an Open Space Subdivision shall be determined by either of the following two methods, at the discretion of the Applicant:

1. Yield Plan: The maximum number of lots reasonably achievable on the property, based on a conventional subdivision design plan consisting of lots meeting or exceeding the minimum dimensions required for lots in conventional subdivisions, conforming to the County's regulations governing lot dimensions, land suitable for development, and street design. The Yield Plan shall be prepared by the applicant, showing how the tract of land could be subdivided to yield the maximum number of buildable residential lots. Although the Yield Plan does not have to meet formal requirements for a site design plan, and is not intended to involve significant engineering or surveying costs, the design must be realistic and economically capable of being constructed, given site features and all applicable regulations. Potential building lots and streets must not be shown in areas that would not ordinarily be permitted in a conventional plan. For example, Yield Plans would include, at minimum, basic topography, wetland locations, l00-year floodplains, and slopes exceeding 25 percent in defining areas unsuited for development. For additional details, see Section 8.4.

On sites not served by public sewerage or a centralized private sewage treatment facility, soil suitability for individual septic systems shall be demonstrated. In areas of the site considered to be marginal for such systems, typically where the most challenging site conditions exist with respect to seasonal high water tables, or shallow depth to bedrock or restrictive soil layers, a small percentage of lots (10%) shall be tested. The local government shall select the lots for such testing. If tests on the sample lots pass the percolation test, the applicant's other lots shall also be deemed suitable for septic systems for the purpose of calculating total lot yield. However, if any of the sample lots fail, several others shall be tested, until all the lots in a given sample pass.

2. Formulaic Approach: Because they represent sensitive environmental features and/or significant cultural resources considered unbuildable in a legal or practical sense, Primary Conservation Areas receive only partial credit toward meeting the minimum open space requirement. Specifically, the maximum number of lots is determined by dividing the area of the tract of land by the minimum conventional lot size specified in the underlying zoning. In making this calculation, 50% (fifty percent) of the following two land types shall be included in the density calculations:

a. Slopes over 25% of at least 5000 square feet contiguous area;

b. The 100-year floodplain;

In addition, 10% (ten percent) of land within rights-of-way for high-tension electrical transmission lines shall be counted.

Furthermore, 5% (five percent) of wetlands meeting the definition of the Army Corps of Engineers pursuant to the Clean Water Act, or land that is submerged for more than three months of the year shall be included in the density calculations.

No density credit shall be given to bodies of open water over 5000 square feet contiguous area, or to land lying within the rights-of-way of existing or proposed streets

Note: In these calculations, density credit may be applied to certain other unconstrained parts of the site, such as land used for onsite sewage disposal, including nitrification fields and fields used for "spray irrigation" (sometimes called "land treatment"). Unless specified otherwise, these lands may also be counted toward meeting the minimum open space requirements for Open Space Subdivisions

3.2 Existing Features/Site Analysis

Since it forms the basis of the open space design process, an Existing Features/Site Analysis Map analyzing each site's special features is required for all proposed subdivisions. The Map shall identify, at minimum, those natural, historic, and cultural features listed in Sections 2.2.b and 2.2.c without distinction as to whether they are Primary or Secondary Conservation Areas.

3.3 Design Process

Open Space Development subdivisions shall be designed around both the Primary and Secondary Conservation Areas, which together constitute the total required open space. The design process should therefore commence with the delineation of all potential open space, after which potential house sites are located. Following that, access road alignments are identified, with lot lines being drawn in as the final step. This "four-step" design process is further described below.

• Open Space Designation: During the first step, all potential Conservation Areas, both Primary and Secondary, shall be identified, using the Existing Features/Site Analysis Map. Primary Conservation Areas shall consist of those features described in Section 2.2.b. above. Secondary Conservation Areas shall comprise at least half of the remaining land and shall include the most sensitive and noteworthy natural, scenic, and cultural resources as described in Section 2.2.c. above.

Guidance as to which parts of the remaining land to classify Secondary Conservation Areas shall be based upon:

On-site visits;

The Open Space Standards contained in Section 2 above; and

The Evaluation Criteria contained in Section 4 below.

The open space shall be designed as an interconnected network of conservation lands to protect wildlife travel corridors and/or to provide trails linking various parts of the neighborhood.

• House Site Location: During the second step, potential house sites are tentatively located. The proposed location of houses within each lot represents a significant decision with potential impacts on the ability of the development to meet the Evaluation Criteria contained in Section 4 below. Generally, house sites should be located no closer than 100 feet from Primary Conservation Areas. Such sites may be situated 50 feet from Secondary Conservation Areas to permit the enjoyment of scenic views without negatively impacting Primary Conservation Areas. (Please note: Steps Two and Three may be reversed in higher-density developments in sewered suburban areas.)

• Street Alignment and Trail Networks: The third step consists of aligning proposed streets to provide vehicular access to each house in the most reasonable and economical manner, and in laying out a network of informal trails connecting neighborhood areas with open space features

within the conservation lands. When lots and access streets are laid out, they shall be located in such a way that avoids or at least minimizes impacts on both Primary and Secondary Conservation Areas. To the greatest extent practicable, wetland crossings and streets traversing slopes over 15 percent shall be strongly discouraged, unless such streets link one buildable portion of a site with another when no other means of access is available.

Street connections shall generally be encouraged to minimize the number of new cul-de-sacs to be maintained and to facilitate easy access to and from homes on different parts of the property and on adjoining parcels. Where cul-de-sacs are necessary, those serving six (6) or fewer homes may be designed with "T-turnarounds" facilitating three-point turns. Cul-de-sacs serving more than six homes shall generally be designed with a central island containing indigenous trees and shrubs, either conserved or planted. All cul-de-sacs should provide trail access to the open space and/or other nearby streets. The creation of single-loaded residential access streets is encouraged to maximize the number of homes in new developments that may enjoy views of open space. To make this approach economical, narrower lots as well as flag lots, both of which help to make the street system more efficient, are permitted in Open Space Developments.

• Drawing in the Lot Lines: The fourth step consists of drawing in lot lines around potential house sites. Each lot must contain a buildable area of sufficient size to accommodate a single-family detached dwelling and customary accessory uses, including, but not limited to, storage buildings and garages, patios and decks, lawns, and driveways. Individual wells and septic systems, where these are to be provided, may be located within the undivided conservation lands if sufficient space is not available on the lots.

3.4 Dimensional Standards

Provided the arrangement, design, and shape of house lots is such that lots provide satisfactory and desirable sites for building, and contribute to the preservation of designated Primary and/or Secondary Conservation Areas, minimum lot area, lot width, and setback requirements may be reduced as set forth below.

• Minimum lot area requirements may be reduced, without a variance, by up to sixty percent (60%) but shall be no smaller than 5,000 square feet.

• Minimum lot width requirements may be reduced by forty percent (40%) but shall be no less than forty (40) feet.

• Minimum front setback requirements may be reduced by fifty percent (50%) but shall be no less than fifteen (15) feet.

• Minimum rear and side setback requirements may be reduced by fifty percent (50%) but shall be no less than five (5) feet. Side setbacks may be combined on one side provided that at least two (2) feet of setback remains on the other. Such combinations are permitted in lot layouts where this pattern is repeated with homes located off-center on their lots but evenly spaced between buildings on adjoining lots.

• Minimum lot frontage requirements may be reduced to twenty (20) feet, to allow for a driveway extension on a "flag lot".

Section 4. Evaluation Criteria

For any given site, resources may vary widely in importance; e.g., a natural area compared to

a historic site. Likewise, for each type of resource, there may be examples of greater or lesser significance; e.g., a notable example of local vernacular building traditions to a much altered older home. Priorities for conserving such resources should therefore be based upon a thorough site analysis and an understanding of what is more special, unique, environmentally sensitive, and or historic as compared with other similar features or different types of resources.

In evaluating the layout of lots and open space, the following criteria will be considered as indicating design appropriate to the site's features and meeting the intent of the Open Space Development standards. Whereas diversity and originality in lot layout are encouraged, it is recognized that not all objectives may be achieved on a given site. Each applicant must therefore achieve the best possible relationship between development and preservation objectives.

In evaluating the relative significance of different categories of site features, or of individual features within certain categories, applicants shall consider recommendations by the Planning Department, during and after the On-Site Visit which precedes submission of the Concept Plan.

4.1 General Criteria

The following criteria apply to all Open Space Development projects:

- Protect and preserve all wetlands, floodplains, and steep slopes from clearing, grading, filling, or construction except as may be approved by the Board of Commissioners.
- The shape of the open space shall be reasonably contiguous, coherently configured, and shall be about existing or potential open space on adjacent properties. Long narrow segments must be avoided except in the case of trail or stream corridors, or landscape buffers adjoining street rights-of-way and/or neighborhood boundaries.
- The pedestrian circulation system shall be designed to assure that pedestrians can walk safely and easily on the site, between properties and activities or special features within the neighborhood open space system. All roadside footpaths should connect with off-road trails, and link with existing or potential open space on adjoining parcels.
- Landscape common areas (neighborhood greens), cul-de-sac islands, and both sides of new streets with native species shade trees and flowering shrubs with high wildlife conservation value.

4.2 Forest Land/Natural Areas Conservation

Where the goal of the Open Space Development project is to conserve forest land and/or natural areas and wildlife habitats, the following criteria apply:

- Dwellings should be located in unwooded parts of the site away from mature forests, natural areas, and/or wildlife corridors.
- To the greatest extent practicable, development should be designed around existing hedgerows and treelines between fields or meadows. The impact on larger woodlands (greater than five acres), especially those containing mature trees, natural areas, and/or wildlife corridors should be minimized.
- When any woodland is developed, care shall be taken to locate buildings, streets, yards, and septic disposal fields to avoid mature forests, natural areas, and/or wildlife corridors.

4.3 Farmland Conservation

Where the goal of the Open Space Development project is to conserve farmland, the following guidelines apply:

- Locate building lots in forested areas away from existing grazing areas, cropland, feedlots, and

similar uses.

• If development must be located on open fields or pastures because of greater constraints on other parts of the site, dwellings should be sited in locations at the far edge of a field, as seen from a public road.

• Identify the most productive portions of existing grazing areas and cropland, and locate building lots on less productive land.

• Buffers shall be provided between house lots and cropland or pastures, to reduce the potential for conflict between residents and farming activities. Such buffers shall generally be 75 feet in width and shall be managed to encourage the growth of successional woodland or other habitat.

4.4 Conservation of Scenic Views

Where the goal of the Open Space Development project is to conserve scenic views, the following guidelines apply:

• Leave scenic views and vistas unblocked or uninterrupted, particularly as seen from public roadways. Consider "no-build, no-plant" buffers along public roadways where views or vistas are prominent or locally significant. In wooded areas where enclosure is a feature to be maintained, consider a "no-build, no-cut" buffer created through the preservation of existing vegetation.

• Where development is located in unwooded areas clearly visible from existing public roads, it should be buffered from direct view by a vegetative buffer or an earth berm constructed to reflect the topography of the surrounding area, or located out of sight on slopes below existing ridge lines.

• Protect rural roadside character and vehicular carrying capacity by avoiding development fronting on existing public roads; e.g., limiting access to all lots from interior rather than exterior roads.

• Protect rural roadside character and scenic views by providing conservancy lots (e.g., ten acres or more in size) adjacent to existing public roads.

• Avoid citing new construction on prominent hilltops or ridges, or so close to hilltops and ridges that rooflines break the horizon (unless such buildings can be effectively screened or buffered with trees).

4.5 Historic and Archaeological Features

Where the goal of the Open Space Development project is to conserve historic and archaeological sites and structures, the following guidelines apply:

• Design around and preserve sites of historic, archaeological or cultural value so as to safeguard the character of the feature(s), including fences and walls, farm outbuildings, burial grounds, abandoned roads, and earthworks.

• New streets, driveways, fences, and utilities must be sited so as not to intrude on rural, historic landscapes. Wherever possible, streets and driveways are to follow existing hedgerows, fence lines, and historic farm drives.

• New developments must include plantings which reflect natural and historic landscape materials, and are in harmony with the character of the area.

• Building designs and styles used in new construction should be compatible with the architectural style of historic buildings located on or adjacent to the site, especially in terms of scale, height, roof shape, and exterior materials.

4.6 Recreation Provision

Where the goal of the Open Space Development is to provide recreation and parks facilities for neighborhood residents and/or the general public, the guidelines contained in Section ___ shall apply.

Section 5. Water Supply & Sewage Disposal Facilities

5.1 Alternative Options

Water supply and sewage disposal facilities to serve Open Space Developments may be provided through the

use of various alternatives, including:

• Individual wells and septic tanks located either on each lot or in off-lot locations within undivided open space areas designated for such uses on the Final Plat, and protected through recorded easements; or

• A community water supply and/or sewage disposal system designed, constructed, and maintained in conformity with all applicable state, federal, and local rules and regulations; or

• Connection to a water supply and/or sewage disposal system operated by a municipality, association, or water or sewer authority. System extensions are permitted only in accordance with applicable water and sewer, and land use policies and shall be sized only to serve the Open Space Development for which the system is extended; or

• A combination of the above alternatives.

Section 6. Discretionary Density Bonuses

The maximum number of building lots or dwelling units in an Open Space Development shall not exceed the number that could otherwise be developed by the application of the minimum lot size requirement and/or density standard of the zoning district or districts in which the parcel is located. However, increases in the number of building lots or dwelling units are permitted through one or more of the following options:

6.1 To Encourage Additional Open Space

1. A density increase is permitted where more than fifty percent (50%) of the unconstrained land area in an Open Space Development is designated as permanent, undivided open space. The amount of the density increase shall be based on the following standard:

For each additional acre of protected open space provided in the Open Space Development, one (1) additional building lot or dwelling unit is permitted

2. In lieu of providing additional open space in the Open Space Development, the applicant may purchase in fee simple or less than fee (e.g., development rights) land separate from the Open Space Development which comprises Primary and/or Secondary Conservation Areas as defined in Section 2. Land purchased in fee may be dedicated to the County, another unit of local government, the State of Texas, or a private non-profit land conservancy.

3. For land purchased in less than fee, a conservation easement shall be recorded which restricts the development potential of the land. The conservation easement shall be dedicated to the County, another unit of local government, the State of Texas, or a private non-profit land conservancy.

6.2 To Encourage Public Access

Dedication of land for public use (including trails, active recreation, municipal spray irrigation fields, etc.), in addition to any public land dedication authorized under the state enabling statutes, may be encouraged by the County, which is herein authorized to offer a density bonus for this express purpose. This density bonus, for open space that would be in addition to the basic public land dedication mentioned above, shall be computed on the basis of one dwelling unit per three acres of publicly accessible open space. The decision whether to accept an applicant's offer to dedicate open space for public access shall be at the discretion of the County, which shall be guided by recommendations contained in existing and future recreation plans, particularly those sections dealing with trail connections, greenway networks, and/or recreational facilities.

6.3 To Encourage Maintenance Endowments

The County may allow a density bonus to generate additional income to the applicant for the express purpose of endowing a permanent fund to offset continuing open space maintenance costs. Spending from this fund would be restricted to expenditure of interest, in order that the principal may be preserved. Assuming an average interest rate of five (5) percent, the amount designated for the Endowment Fund should be twenty (20) times the amount estimated to be needed on a yearly basis to maintain the open space. On the assumption that additional dwellings, over and above the maximum that would ordinarily be permitted on the site, are net of development costs and represent true profit, 75 percent of the net selling price of the lots should be donated to the Open Space Endowment Fund for the conservation lands within the subdivision. Such estimates should be prepared by an agency or organization with experience in open space management acceptable to the County. This fund shall be transferred by the developer to the designated entity with ownership and maintenance responsibilities, such as a homeowners' association, a land trust, or a unit of local government.

6.4 To Encourage Affordable Housing

A. A density increase is permitted where the Open Space Development provides on-site or off-site housing opportunities for low or moderate-income families. The amount of the density increase shall be based on the following standard:

For each affordable housing unit provided in the Open Space Development, one (1) additional building lot or dwelling unit is permitted Affordable housing is defined as units to be sold or rented to families earning 70 to 120 percent of the County median income, adjusted for family size, as determined by the U.S. Department of Housing and Urban Development.

B. In lieu of providing affordable housing units in the Open Space Development, the applicant may donate to the County land separate from the Open Space Development with suitable soils or access to public water and sewer for the purpose of developing affordable housing. The donated land shall contain at a minimum the land area needed to develop the total number of bonus units in accordance with the zoning requirements of the district in which the donated land is located, together with a minimum of twenty (20) percent open space land, at least half of which is suitable for active recreation.

Section 7. Procedures for Application and Approval

7.1 Concept Plan

A. Pre-Application Review: To promote better communication and avoid unnecessary expense in the design of acceptable subdivision proposals, each subdivider is encouraged to meet with the Planning Department prior to filing an application for Concept Plan approval. The purpose of this informal meeting is to introduce the applicant to the provisions of this Ordinance and discuss his/her objectives in relation thereto.

B. On-Site Visit: Prior to the submission of a Concept Plan, the applicant shall schedule a mutually convenient time to walk the property with the Planning Department staff. The purpose of this visit is to familiarize the Planning Department staff with the property's special features, and to provide them an informal opportunity to offer guidance to the applicant regarding the tentative location of Secondary Conservation Areas, and potential house locations and street alignments.

Prior to scheduling the on-site visit, the applicant shall have prepared the Existing Features/Site Analysis Map as required in Section 8.3 below. If the on-site visit is not scheduled before the Concept Plan submission; it should occur prior to the Public Information Meeting described below.

C. Application Requirements: Applications for Concept Plan approval shall be submitted to the Planning Department prior to the submission of a Preliminary Plat and shall contain the following information:

- A County Tax Map showing the location of the parcel to be subdivided.
- Fifteen (15) copies of a Concept Plan of the proposed major subdivision prepared in accordance with the specifications for Concept Plan drawings as contained in Section 8 of this Ordinance. A Concept Plan shall consist of three parts, including:

An Existing Features/Site Analysis Map;
A Yield Plan; and
An Open Space Development Plan.

- Concept Plan application form as prescribed by the Planning Department in a form which provides a checklist identifying consistency with applicable design guidelines, the goals of the County's Comprehensive Plan, and the stated purposes of the zoning district within which the development is to be located.
- Stamped envelopes addressed to each owner of property within 500 feet of the property proposed to be subdivided. The names and addresses of property owners shall be based on the current listing as shown in the County Tax Office or Land Records System.

D. Public Information Meeting: Upon receipt and acceptance of the Concept Plan application, the Planning Department shall schedule a Public Information Meeting and mail notices of the meeting to each owner of property within 500 feet of the property proposed to be subdivided. The Public Information Meeting shall be held within 15 days of acceptance of the application, and notices shall be mailed by first class mail at least ten (10) days prior to the date of the meeting.

At the meeting, the Planning Department staff will explain the County's subdivision approval process, and the applicant will be available to answer questions about the proposed subdivision.

E. Planning Department Review Procedures: Within thirty (30) days of the date of the Public Information Meeting or within such further time consented to in writing by the applicant, the Planning Department shall submit to the Planning Board its recommendation, including a written analysis of the Concept Plan; its general compliance with the requirements of this Ordinance, the Comprehensive Plan, and other applicable codes and ordinances; and the concerns of citizens expressed at the Public Information Meeting. If the Planning Department fails to prepare a report to the Planning Board within the specified time period, or extension thereof, the Concept Plan is recommended without conditions.

F. Planning Board Review and Approval Procedures: After receiving the Planning Department's report or, if applicable, the expiration of the time period prescribed in Section III-D-I-b, the Planning Board shall consider the Concept Plan and take action on the proposals. The Planning Board shall base its action on its findings as to the conformity of the proposals with all applicable regulations and shall:

- Approve the Concept Plan;
- Approve the Concept Plan subject to conditions; or
- Deny the Concept Plan.

If the Planning Board approves the Concept Plan subject to conditions, such conditions shall be reasonable and shall seek to insure compliance with applicable regulations. If the Planning Board denies the Concept Plan, the reasons for such decision shall be stated in writing to the applicant and entered into the minutes of the meeting at which such action was taken.

The Planning Board shall take action within forty-five (45) days of the meeting at which the Planning Department's report is submitted to it or within such further time consented to in writing by the applicant. If the Planning Board fails to take action within the specified time period, or extension thereof, the Planning Board shall be deemed to recommend approval of the Concept Plan without conditions.

G. Action Subsequent to Approval: If the Concept Plan is approved or approved with conditions, the Planning Board Chair shall endorse his/her approval on two (2) copies of the Concept Plan. One (1) copy of the Concept Plan shall be retained by the Planning Department, and one (1) copy shall be returned to the subdivider or his/her authorized agent.

From the date of approval of the Concept Plan by the Planning Board, the applicant shall have one (1) year in which to prepare and file an application for Preliminary Plat approval. If a Preliminary Plat for the subdivision has not been submitted within the specified time limit, the Concept Plan shall become null and void.

H. Appeal Procedures: The decision of the Planning Board regarding the Concept Plan may be appealed to the Board of Commissioners. If appealed, the Concept Plan shall be placed on the next regular meeting agenda of the Board of Commissioners. The Board of Commissioners shall have final approval authority, and, where applicable, all Concept Plans shall contain information and/or conditions approved by the Board of Commissioners.

The Board of Commissioners in all such appeals shall make findings of fact in support of its decision. The applicant shall be notified, in writing, of the Board of Commissioners' decision within ten (10) days after said decision is made.

Section 8. Specifications for Concept Plans

8.1 Components of Concept Plans

The Concept Plan required by Section 7 shall consist of three parts:

- An Existing Features/Site Analysis Map;
- A Yield Plan; and
- An Open Space Development Plan.

The Concept Plan shall be prepared according to the "four-step" process for designing open space subdivisions described in Section 3.3 above. In addition, the Concept Plan shall be prepared by a team including at least a civil engineer or registered land surveyor, plus either a landscape architect or a land use planner experienced in open space design.

Each map or plan shall be drawn in black ink or pencil to a scale of not less than two hundred (200) feet to the inch. The scale chosen shall be large enough to show all required detail clearly and legibly.

8.2 General Information

Each map or plan required in Section 8.1 above shall contain the following general information:

a. A sketch vicinity map showing the location of the subdivision in relation to the existing street or highway system;

b. The plotted boundaries of the tract from deeds or maps of record and the portion of the tract to be subdivided;

c. The total acreage to be subdivided, including tax map, block and lot number reference;

d. The name, address and telephone number of the subdivider or owner and the person responsible for the subdivision design;

e. Scale, approximate north arrow and date of plat preparation; and

f. Name of subdivision.

8.3 Existing Features/Site Analysis Map

As determined from readily identifiable on-site inventories, aerial photographs, maps of record, State/Federal resource maps, and local planning documents and inventories, the

Existing Features/Site Analysis Map shall contain the following information:

a. Primary Conservation Areas: Identification of physical resources associated with the site which restrict its development potential or contain significant natural and/or cultural resources, including:

- Topographic contours at ten-foot intervals, showing rock outcrops and slopes of seven and one-half percent (7½%) to fifteen percent (15%), and more than fifteen percent (15%).
- Soil type locations and characteristics relating to seasonal high water table and depth to bedrock.
- Hydrologic characteristics of the site, including drainage tributaries, surface water bodies, floodplains, and wetlands.

b. Secondary Conservation Areas: Identification of significant site elements on buildable portions of the site, including:

- Vegetation of the site, defining approximate location and boundaries of woodland areas, and, wherever

possible, vegetative association in terms of species and size. Information from aerial photographs shall be acceptable at the Concept Plan stage.

• Current land use and land cover (cultivated areas, pastures, etc.), existing buildings and structures, and burial grounds.

• Natural areas, and wildlife habitats and corridors.

• Historic and archaeological sites, especially those listed on the National Register of Historic Places or included on the State's National Register study list, designated as a local historic landmark, and/or located in a local historic district.

• Scenic views onto the site from surrounding roads as well as views of scenic features from within the site.

c. Transportation and Utility Systems: Identification of facilities associated with the movement of people and goods, or the provision of public services, including:

• Railroad and street rights-of-way.

• Easements for vehicular access, electric and gas transmission lines, and similar uses.

• Public and private water and sewer lines, and storm drainage facilities.

8.4 Yield Plan

The Yield Plan shall contain the following information:

a. In addition to basic topography, the location of areas unsuited for development, including wetland locations, 100-year floodplains, and slopes exceeding 25 percent;

b. the proposed arrangement of lots, including size and number, and streets within the subdivision, including right-of-way widths; and

c. The location of soils suitable for individual septic systems as determined by:

• A map based on the medium-intensity soil survey for the County, published by the USDA Natural Resources Conservation Service, showing the location of soil types suited for septic systems. This map shall be prepared in consultation with the Soil Scientist of the Environmental Health Division of the County Health Department.

• In reviewing the soils data in relation to the layout of the proposed lots, the County Planning Department may require the applicant to present the results of the preliminary soil suitability analyses conducted on a 10% to 15% sample of the proposed lots as required in Section 3.1.

8.5 Open Space Development Sketch Plan

1. A Sketch Plan shall be submitted by the applicant as a diagrammatic basis for informal discussion with the County Planning Commission regarding the design of a proposed subdivision or land development. it shall be drawn by a landscape architect, or by a physical planner experienced in conservation subdivision design. One of the purposes of the Sketch Plans is to help applicants and officials develop a better understanding of the property and to help establish an overall design approach that respects its special or noteworthy features, while providing for the density permitted under the zoning ordinance.

2. To provide a full understanding of the site's potential and to facilitate the most effective exchange with the Planning Commission, the Sketch Plan should include the information listed below. Many of these items can be taken from the Site Analysis Map, a document that must in any case be prepared and submitted no later than the date of the Site Inspection, which precedes the Preliminary Plan. The diagrammatic Sketch Plan shall be prepared as an overlay sheet placed on top of the Site Analysis Map, both maps therefore being drawn to the same scale.

3. Sketch Plans shall be prepared by a landscape architect or by a physical planner with experience designing Open Space Subdivisions. Civil engineers and surveyors may also be added to the design team at this stage. However, their role does not become pre-eminent until the Preliminary Plan stage.

4. The Open Space Development Sketch Plan shall contain the following information:

a. The proposed arrangement of lots within the subdivision, including size and number.

b. The proposed street layout within the subdivision, including travelway and right-of-way widths, and connection to existing streets.

c. The location, type, and area of the open space proposed in the subdivision, including open space to be

preserved:

• In a separate lot or lots under the ownership of a homeowners' association.

• As part of individually owned lots through a conservation easement applicable to multiple lots.

• In a separate lot or lots through dedication for public use, such as a park site, to a unit of local government, state government or a private land conservancy.

d. The location of proposed water supply and sewage disposal facilities, including:

• Well sites for individual and community water systems.

• Nitrification fields and land application areas for community sewage disposal systems employing subsurface disposal and spray irrigation, respectively.

• Nitrification fields and land application areas for individual on- and off-lot sewage disposal systems employing subsurface disposal and spray irrigation, respectively.

Public water and sewer lines, where such facilities are available or capable of being extended.

8.6. Sketch Plan Submission and Review

Copies of a diagrammatic Sketch Plan, meeting the requirements described above, shall be submitted to the Commission's Secretary during business hours for distribution to the Planning Commission, the County Planner, the County Engineer and applicable advisory boards at least seven (7) days prior to the Planning Commission meeting at which the Sketch Plan is to be discussed. The Sketch Plan diagrammatically illustrates initial thoughts about a conceptual layout for Open Space lands, house sites, and street alignments, and shall be based closely upon the information contained in the Site Analysis Map. The Sketch Plan shall also be designed in accordance with the four-step design process herein.

1. The Planning Commission shall review the Sketch Plan in accordance with the criteria contained in this ordinance and with other applicable ordinances of the County. Their review shall informally advise the Applicant of the extent to which the proposed subdivision conforms to the relevant standards of this Ordinance, and may suggest possible plan modifications that would increase its degree of conformance. Their review shall include but is not limited to:

a. the location of all areas proposed for land disturbance (streets, foundations, yards, septic disposal systems, storm water management areas, etc.) with respect to notable features of natural or cultural significance as identified on the applicant's Site Analysis Map and on the County's Map of Potential Conservation Land, in its Comprehensive Plan;

b. the potential for street connections with existing streets, other proposed streets, or potential developments on adjoining parcels;

c. the location of proposed access points along the existing road network;

d. the proposed building density and impervious coverage;

e. the compatibility of the proposal with respect to the objectives and policy recommendations of the County Comprehensive Plan and

f. consistency with the zoning ordinance.

The Commission shall submit its written comments to the applicant and the Board. The diagrammatic Sketch Plan may also be submitted by the Board to the County Planning Commission for review and comment.

8.7 Management Plan

1. Applicants shall submit a Plan for Management of Open Space and Common Facilities ("Plan") that:

a. allocates responsibility and guidelines for the maintenance and operation of the Open Space and any facilities located thereon, including provisions for the frequency of specific ongoing maintenance activities and for long-term capital improvements;

b. estimates the costs and staffing requirements needed for maintenance and operation of, and insurance for, the Open Space and outlines the means by which such funding will be obtained or provided;

c. provides that any changes to the Plan be approved by the Commission; and

d. provides for enforcement of the Plan.

2. In the event the party responsible for maintenance of the Open Space fails to maintain all or any portion in reasonable order and condition, [the jurisdiction] may assume responsibility for its maintenance and may

enter the premises and take corrective action, including the provision of extended maintenance. The costs of such maintenance may be charged to the Homeowner's Association, or to the individual property owners that make up the Homeowner's Association, and may include administrative costs and penalties. Such costs shall become a lien on all subdivision properties.

8.8 Legal Instrument for Permanent Protection

1. The Open Space shall be protected in perpetuity by a binding legal instrument that is recorded with the deed. The instrument shall be a permanent conservation easement in favor of either:

• a land trust or similar conservation-oriented non-profit organization with legal authority to accept such easements. The organization shall be bona fide and in perpetual existence and the conveyance instruments shall contain an appropriate provision for retransfer in the event the organization becomes unable to carry out its functions; or

• a governmental entity with an interest in pursuing goals compatible with the purposes of this ordinance. If the entity accepting the easement is not the County, then a third right of enforcement favoring the County shall be included in the easement.

2. The instrument for permanent protection shall include clear restrictions on the use of the Open Space. These restrictions shall include all restrictions contained in this article, as well as any further restrictions the Applicant chooses to place on the use of the Open Space.

8.9. Tax Assessment of Open Space

Once a legal instrument for permanent protection has been placed upon the Open Space, the County tax assessment office shall be directed to reassess the Open Space at a lower value to reflect its more limited use. If the Open Space is used purely for passive recreational purposes and the terms of the instrument for permanent protection effectively prohibit any type of significant

economic activity, then the assessment shall be at a value of zero.

APPENDIX F

COST COMPARISONS

As a part of the design charrette, the team collected data from two real-world sites, the Michaelis Tract and the Pecan Woods Tract, and created a mockup to look at the potential infrastructure costs for a conventional subdivision, a "context-sensitive" subdivision, and different versions of full conservation subdivisions. These comparisons also show the total lots yielded in each version and the amount of land conserved. See the graphic on the next page for the full cost comparisons.

CHARRETTE RESULTS: MICHAELIS TRACT

	CONVENTIONAL SUBDIVISION	CONTEXT-SENSITIVE SUBDIVISION	CONSERVATION SUBDIVISION 1	CONSERVATION SUBDIVISION 2
TOTAL LOT YIELD	182*	276	194	87
CONSERVATION LAND**	5%	53%	62%	65%
TOTAL INFRASTRUCTURE CONSTRUCTION COST	$13M	$17M	$15M	$8M
INFRASTRUCTURE COST PER LOT	$63,500	$55,800	$67,500	$95,300

*If a sustainable, public water supply had not been available on this site, then lot yield would have been n
**Percentage of gross property that is dedicated to Conservation Land. Open Space does not include floodp

CHARRETTE RESULTS: PECAN WOODS TRACT

	CONVENTIONAL SUBDIVISION	CONTEXT-SENSITIVE SUBDIVISION	CONSERVATION SUBDIVISION
TOTAL UNIT YIELD	2,129	2,156	2,162
CONSERVATION LAND**	21%	53%*	59%*
TOTAL INFRASTRUCTURE CONSTRUCTION COST	$59M	$38M	$36M
INFRASTRUCTURE COST PER PLATTED LOT***	$40,320	$32,000	$30,000

*Open space conservation land includes 100% of floodplain land.
**Percentage of gross property that is dedicated to Conservation Land. Open Space does not include floodplain land, unless explicitly stated.
***Some Multi-Family lots may have multiple units.

APPENDIX G

MENU-OF-OPTIONS MATRIX AND STANDARDS - SAMPLE

On the following pages you will find a sample of the menu-of-options matrix and standards. This is a sample of the online interactive spreadsheet created by the team to allow developers to easily see what conservation elements they need to include in their subdivision in order to get different levels of incentives. Scores for varying levels of conservation efforts allow users to pick and choose which elements to include depending on cost and the natural restrictions/opportunities of the land. The levels of incentives are silver, gold, and platinum. The team recommends that these incentive levels and the point system be revisited in 1-3 years to refine the system after real-world application. The spreadsheet is intended to provide structure to the county process as a starting point for negotiations and the creation of a development agreement.

Hays County Conservation Development Guidelines: A Sustainable Future			
Must-have Prerequisites:			
Minimum Tract Size	**100 Acres**		
Maximum Impervious Cover – Gross Site	**20% across the gross site**		
Minimum Open Space Conservation	**50% of gross tract size, including no more than 50% of on-site floodplain land**		
No Direct Wastewater Discharge Into Streams	**No direct wastewater discharge into streams of any kind**		
Reduce Impervious Cover – *A development must not exceed a maximum of 20% impervious cover across the gross site in order to be designated as a conservation development.*			
Examples to consider to reduce on-site impervious cover: Narrow roads, permeable pavers/ open-cell grids, porous asphalt, sidewalks on one side only (based on traffic counts), grasscrete/ permeable driveways			
Amount of Impervious Cover	**Percentage Selection**	**Incentive Point Total**	
	<5%	**15**	
Open Space Conservation - *A development must meet a minimum of 50% open space conservation across the gross site in order to be designated as a conservation development. No more than 50% of on-site floodplain can be counted towards the open space minimum.*			
Examples of open space conservation to consider: Preserve on-site open space, farm and ranch land, viewsheds, wildlife corridors, critical habitat, floodplain land			
Amount of Open Space Conservation	**Percentage Selection**	**Incentive Point Total**	
	>75%	**10**	
***Additional Points:* Adjacency to Other Existing Conservation Lands**	**Acreage of Adjacent Lands**	**Incentive Point Total**	
	Greater than 100 acres with adequate adjacency for connectivity	**3**	
***Additional Points:* Written Land Stewardship Plan**	**Percentage Selection**	**Incentive Point Total**	
	Yes	**6**	
Water Recapture and Reuse	**For each option, please select from the dropdown menu.**		**Incentive Point Total**
Rainwater harvesting as a primary source for potability or irrigation	Yes	6	**15**
Purple pipe and water re-use	Yes	3	
Xeriscaping / Turf Management Plan that matches City of San Marcos, City of Austin, or another recognized source	Yes	3	
Temporary irrigation on landscape with no more than three years use / Supplemental irrigation based on rainwater harvesting	Yes	2	
HVAC condensate recovery	Yes	1	
Water Quality and Conservation - *A development must agree to not discharge wastewater directly into streams of any kind on- and off-site in order to be designated as a conservation development.*	**ect from the dropdown menu.**		**Incentive Point Total**
Low Impact Design (LID) – promote overland flow through lay down curbs, and implement other LID features such as: rain garden, bioswale, bioretention area, infiltration structure, filter strip implementation, dispersion (roof runoff), etc.	Yes	6	**22**
Demonstrated design to target max. use of surface and ground water to 120 gallons/person/day	Yes	6	
High-level, approved innovative collective wastewater treatment and disposal / Implementation of high-end drip irrigation systems or other innovative septic	Yes	6	
Add.itional well spacing, or surface water source that is at least 60% from a source other than a local groundwater supply per County lot-sizing rules	Yes	2	
Demonstrated preservation of slopes greater than 15%	Yes	2	
Floodplain and Stream Buffer Protection - *A developer must agree to not develop and apply impervious surfaces to areas within floodplains, except for approved trails and road/stream crossings.*	**For each option, please select from the dropdown menu.**		**Incentive Point Total**
Floodplain Management (additional setbacks from 100-year floodplain and limited I.C. in trails and road crossings, demonstrating minimal impact within the floodplain)	Yes	3	**11**
Raised grading / finished floor to exceed local government floodplain regulations	Yes	3	
Bridge design and construction significantly exceeds county event standard	Yes	3	
Reforestation to an established riparian restoration program	Yes	1	
Wayfinding / education about on-site floodplain and riparian areas	Yes	1	
Habitat Protection	**For each option, please select from the dropdown menu.**		**Incentive Point Total**
Protection of critical environmental features, exemplified by buffers around CEFs, including springs, seeps, wetlands, and point recharge features such as caves, rim rock, and cliffs	Yes	4	**14**
Habitat protection, including buffers, for species listed in the Hays County Habitat Conservation Plan and/or listed by TWPD as species of conservation interest	Yes	2	
Riparian restoration within 100 feet of areas draining greater than 5 acres	Yes	2	
Protection / restoration of wildlife corridors	Yes	1	
Dark sky-friendly outdoor lighting	Yes	1	

Conservation / restoration of on-site native plant communities	Yes	1	
Invasive species management	Yes	1	
Native tree canopy enhancement and protection	Yes	1	
Pesticide restrictions / Management plan	Yes	1	
Cultural and Historical Preservation	**For each option, please select from the dropdown menu.**		**Incentive Point Total**
Preservation of active farm or ranch land	Yes	2	
Protection of prime farmland soils	Yes	2	
Preservation of known and recorded historical Texas landmarks and Texas Historic Commission (THC) sites on property	Yes	1	**8**
Preservation off recognized areas of cultural signifficance Restoration / wayffinding of historical area	Yes	1	
Restoration / wayfinding and/or public education for historic or cultural area	Yes	1	
Documentation / New studies	Yes	1	
General Health and Recreation Enhancement	**For each option, please select from the dropdown menu.**		**Incentive Point Total**
LEED Certification	Yes	2	
SITES Certification	Yes	2	
Clean energy (deed restrictions for solar panels, use of wind, natural gas, etc.)	Yes	1	
Trail or multimodal connectivity to other adjacent developments and/or region	Yes	1	
Dedicated trails / Recreation areas	Yes	1	
Vegetated roofs and/or other sustainable building materials and strategies to minimize either roof runoff or heat island effect	Yes	1	**12**
Implement passive solar orientation	Yes	1	
Community garden(s)	Yes	1	
Wider sidewalks or multi-use paths	Yes	1	
Active recreation: Sports fields, playgrounds, etc.	Yes	1	
Fiscal and Community Responsibility	**For each option, please select from the dropdown menu.**		**Incentive Point Total**
Dedication of parkland and/or rights-of-way and land for schools, public buildings or community services	Yes	6	
Public access to open space	Yes	3	
Demonstrate long-term savings for county VS. traditional design (road maintenance, cost of services, etc.)	Yes	1	**12**
Community standpipes, ponds, or storage for fire protection	Yes	1	
Other community benefit (to be proven by developer)	Yes	1	

Cumulative Score
104

Potential Incentives	
Silver	
Minimum of 35-49 points required	
County issued certification that developers can use in marketing and can be advertised on the County's website	**Available**
Possible reduced or waived parkland dedication fees	
Reduction in street pavement width requirements	
Alternative surfacing for rural road	
Unified reviews and inspections through interlocal agreements	
Gold	
Minimum of 50-70 points required	
Density bonuses	**Available**
Reduced or delayed review/permit fees for development review process	
Consider mitigation credits offered at a discounted rate	
Platinum	
Minimum of 70+ points	
Performance incentive by means of Local Government Code Ch. 381 Agreements	**Available**
Public Improvement District (PID) funding	
County could facilitate with Hays County Appraisal District (HCAD) and assist Developer with 1-D-1 Open Space valuation	
County could purchase Conservation Easements (CEs) on dedicated open space	
County could assist with developing a land management plan and implementation for acreage under Conservation Easement	

APPENDIX H

CHECKLIST

HAYS COUNTY

Hays County Development Services-2171 Yarrington Rd #100, Kyle, TX 78640

Staff Contact: Marcus Pacheco, Development Services Director
Phone: (512) 393-2150
Email: marcus.pacheco@co.hays.tx.us

PRELIMINARY CHECKLIST

Keep in mind that typically a property must be about 100 acres or more in total size to qualify for conservation subdivision development.

_____ 1. Answer the following three questions:

1. Will more than 50% of the property's developable land (not including floodplain or steep slopes) be devoted to conservation?
2. Will the development have less than 20% impervious cover overall?
3. Can you ensure no direct discharge of sewage into on-site and adjacent creeks/ streams?

Note – If you have answered yes to all of the above, then you may be eligible for development incentives through the County's conservation development program. Follow the steps below to move forward in the conservation development process.

If you have answered no to all or some of the above, but believe you have a good conservation case to make, schedule a meeting with Development Services to discuss modified incentives.

_____ 2. Set up a meeting with Development Services and/or your County Commissioner to discuss your plan and the County's guidelines. Other County departments, such as the Natural Resources and Transportation departments, will also be working closely with you throughout the broader entitlement and development process.

_____ 3. Review the County's conservation guidelines, requirements, and incentive matrix. Determine what points you think you might qualify for, and what incentives you wish to pursue.

Follow the link below to access the County's interactive matrix and incentives table.
[insert link]

_____ 4. Use the interactive goals/ incentives matrix to calculate your points.

_____ 5. Submit your concept plan, conservation initiatives, and the associated point calculation to Development Services for County review. The more detailed the plan, the better. County staff can work through details with you.

_____ 6. Formalize your obligations and the County incentives you qualify for through a Development Agreement with Hays County.

APPENDIX I
SOURCES

GIS maps:
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5. Waterfront Parks – Naturally Resilient Communities. http://nrcsolutions.org/waterfront-parks/.
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