# Hill Country Urbanism—A case study of Jacob Well

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# Introduction

# What is Hill Country, where it is located? Why it is an interesting place?

The Texas Hill Country is comprised of 17 counties in central Texas, covering 11 million acres.



Austin and San Antonio lie at its eastern and southern edges respectively, the plateaus of the Balcones Escarpment rising dramatically at the edges of each city. I-35 loosely marks this boundary, while I-10 cuts "Maps | Hill Country Alliance." Accessed October 28, 2017. http://www.hillcountryalliance.org/maps/. directly through. As the former dean of The University of Texas School Architecture, Dean Steiner, once said, if the Hill Country were located anywhere else in the United States, it would be a national park<sup>1</sup>.

The namesake hills of the Hill Country are not hills but the top of a deeply incised limestone plateau. Several notable rivers and innumerable small creeks cut through the plateau, creating deep canyons, some now forming large artificial lakes. The porous nature of limestone allows for the Trinity and Edwards aquifer to exist, feeding springs across the Hill Country. Some, like Barton Springs and Jacob's Well, have vbecome world-famous tourist attractions and essential components of the character of the Hill Country.

The Hill Country's ecology is comparably unique, due to both its geology and its location between multiple ecoregions. The western edge transitions to the Chihuahuan Desert near Fort Stockton. The northern edge flattens out to the high plains which stretch into Canada. The eastern edge slopes down to the East Texas Plains, and the southern edge borders the South Texas Plains, a region stretching into Mexico. Such an intersection and overlap of ecoregions means the Hill Country is home to many plants at the very edge of their native habitat range, where they take on novel phenotypes to adapt. Some species, such as the Blanco crabapple *Malus ioensis* var. *texana* and Plateau Live Oak *Quercus fusiformis*, are found nowhere else, having adapted to the thin, alkaline soils of the region. Similarly, the hydrology of the region supports many endemic aquatic species. The World Wildlife Fund specifically identifies the Edwards Plateau for its high conservation value and endemism<sup>2</sup>.

The Hill Country has evidence of human habitation dating back at least 12,000 years, making it home to some of the first people to inhabit the continent. Surely the abundant water, sheltered valleys, and rolling plains rich with game animals made the area very desirable for early settlers. Early Mexicans and Texians favoured the area for ranching, though the Hill Country was until recently fairly out of the way and isolated. The road to Wimberley was not paved until 1928. Electricity didn't arrive for another ten years. It wasn't until the postwar Texas building boom that development arrived in Wimberley, attracting vacationers from Austin and San Antonio<sup>3</sup>. While the first surge in growth happened in the 1950s and 60s, the urban growth of the 2000s and 2010s is truly unprecedented and threatens to change the character of the Hill Country forever.

<sup>1</sup> Allen, Letha, Meghan Bock, Annie Boggs, Britin Bostick, Rebecca Fleisher, Ian Johnston, Laura Keating, et al. "Towards a Regional Plan for the Texas Hill Country." The University of Texas at Austin, 2015.

<sup>2 &</sup>quot;Edwards Plateau Savanna | Ecoregions | WWF." World Wildlife Fund. Accessed October 16, 2017. https://www.worldwildlife.org/ecoregions/na0806.

<sup>3 &</sup>quot;Village of Wimberley Comprehensive Plan." City of Wimberley, February 4, 2016.

# Context of the Study

# Towards a Regional Plan for the Texas Hill Country

In the fall of 2015, The University of Texas School of Architecture produced "Towards a Regional Plan for the Texas Hill Country," the result of the Hill Country Studio. The studio was developed in partnership with the Hill Country Alliance, and sought to map a way forward for the region of central Texas we call the Hill Country. Robert Yaro, former president of New York's Regional Plan Association, was recruited by Dean Frederick Steiner to lead the studio, bringing his expertise in planning for large, complex landscapes<sup>4</sup>.

"Towards a Regional Plan for the Texas Hill Country" sought to address the chronic weakness of regulation in the Hill Country when confronted with the unprecedented economic growth of the I-35 corridor. What small regulatory apparatuses exist are small and are not able to coordinate sufficiently. City limits are quite small, and counties in Texas lack authority over land use. Culture plays no small part in this issue: in the words of the studio, "the blind adherence to individual property rights means that everyone's property is at risk due to unregulated land development and abuse of groundwater." The irony of the situation is that the allure of the Hill Country, its rural character, is rapidly disappearing under subdivisions while its groundwater is being rapidly depleted.

The Hill Country Studio recommends the creation of a "Hill Country Endowment," funded by taxes "and other sources," and spent on purchasing conservation easements, protecting recharge features, and financing infrastructure. A clear benefit for the communities on the I-35 corridor is a reliable groundwater supply, while communities further west would preserve their historic rural character, rather than be transformed into suburban bedroom communities for Austin and San Antonio.

The Hill Country Endowment is intended to further shape growth in the area by setting utility limits and defining growth boundaries, and concentrating development around transit, including a proposed Lone Star rail line that would parallel I-35. Rather than small towns like Wimberley extending low-density development into the rolling hills that surround it, they would be given greater resources to encourage infill and higher-density development and discourage suburban sprawl.

## In Practice: the Jacob's Well Studio

In the fall of 2017, the Jacob's Well Studio seeks to continue the mission of the Hill Country Studio in imagining a sustainable future for the Hill Country, one that preserves the region's natural resources, especially water, as well as the rich blend of cultures that make the region distinctively Texan. In partnership with the Wimberley Valley Watershed Association (WVWA), the Jacob's Well Studio produced

<sup>4</sup> Allen, Letha, Meghan Bock, Annie Boggs, Britin Bostick, Rebecca Fleisher, Ian Johnston, Laura Keating, et al. "Towards a Regional Plan for the Texas Hill Country." The University of Texas at Austin, 2015.

three proposals for a site near the Village of Wimberley and the Jacob's Well spring. WVWA was the imagined client of a development team. Each proposal is intended to show a feasible alternative pattern of development while considering today's context.

The studio's objectives are:

- To understand the roles and potential of each discipline in the urban built environment through physical planning and urban design
- To be able to develop critical strategies that address economic, social and environmental implications in the urban context through the process of analysis, case study evaluation and collaborative practice
- To be able to graphically and verbally communicate design strategies and complex urban issues to a wide audience including professionals and the general public
- To become comfortable using GIS, Indesign, Photoshop, Sketchup and other graphic related software to present physical planning and urban design content

The proposals seek to test the concepts presented by the proposed Hill Country Regional Plan, creating a high-density, water-neutral development which accommodates population growth while maintaining open space. The project site, part of Woodcreek North, is currently owned by a private developer and platted for quarter-acre parcels and single-family, detached homes. However only a minority of the parcels are sold, and fewer still have homes on them. The project site boundaries are drawn around multiple undeveloped parcels, encompassing both sides of Ranch Road 2325 roughly a mile and a half from downtown Wimberley. The Jacob's Well Elementary School and Wimberley ISD Baseball and Softball complex both border the project site, as does an AquaTex water treatment plant.

The scope of the class is to create a new master plan for the designated site as per the client's goals and programmatic elements listed below to ideally include water neutral, low impact development. The plan will include the following desired features:

- 1. 250- 500 units of housing single-family, multi-family, townhome
- 2. Energy and water efficient commercial/retail space including live/work spaces
- 3. Walkable mixed-use town center, village, or hamlet with green streets
- 4. Community Space including meeting space and non-profit office space
- 5. Affordable housing and community land trust
- 6. Climate appropriate agricultural production (micro-farm, permaculture) and gardens
- 7. Open space network with parkland, trails and diverse natural habitats that promote clean and abundant aquifer recharge

Finally, the students were directed to: "develop a "Hill Country Urbanism" as an alternative to typical suburban development in the Hill Country". This means considering "the conclusions of the Hill Country Studio to propose a high-density, low-impact model of development in the region," and considering "the water, ecology, climate, culture, and genus loci of the Hill Country in design"

The goals for the student proposals are ambitious, and few precedents exist to guide students in their design. New Urbanist developments are more frequently found in existing cities, such as the Mueller development on the site of the former city airport in Austin, TX. Greenfield New Urbanist developments can create vacation enclaves, such as Seaside, FL.

Perhaps the closest contemporary precedent is Serenbe, GA, a sort of 21<sup>st</sup> century garden suburb at the edge of Atlanta. Serenbe created three "hamlets", Selborne, Mado, and Grange, where homes and businesses cluster. The names are evocative of the community's identity: "Mado" is a Creek Indian word for "in balance", "Grange" is agriculture-themed, and "Selborne" is named for an English arts village. In between the hamlets are large pockets of green space, kept relatively intact by exurban standards. Walkability is a high priority, and streets are narrow to calm traffic. In terms of sustainability, Serenbe comes up short compared to the Jacob's Well Studio requirements. Serenbe pursues sustainability "by facilitating geothermal, solar, and net zero homes" and conserving water by "naturally treating our wastewater for ornamental irrigation"<sup>5</sup>. The Jacob's Well Studio is much more ambitious by sustainability metrics.

Indeed, Serenbe recalls a development typology that has been dormant in America for almost a century: the garden city. The American expression of an English ideal were suburbs such as Radburn, N.J. and the New Deal "greenbelt" towns of Greenbelt, MD, Greendale, WI, and Green Hills, OH. These towns designed for the pedestrian experience, preserved continuous green space with moderate housing density, and created an arcadian living experience in the suburbs. Like Serenbe, great emphasis was placed on their "natural" setting<sup>6</sup>

The Jacob's Well Studio is not unlike these case studies in its vision of creating a sort of garden city, but one for the 21<sup>st</sup> century. It differs from developments that have come before it in its strong environmental ethic. Water neutrality is an engineering challenge for an area that suffers from frequent floods and droughts, but the technology is there. This is true of energy neutrality as well. Today, practices of land management are well-documented, from Brad Lancaster's work on water harvesting to the Lady Bird Johnson Wildflower Center's work on prescribed burns in the Hill Country. The land that the development sits on can take on a role of its own in a sort of "regenerative" development that seeks to exceed simple sustainability.

#### Challenges and Opportunities in Area

A primary challenge of development in the Hill Country today is water. Poorly understood but essential to the ecology and culture of the region, the limestone plateau is a region of ephemeral creeks,

<sup>5 &</sup>quot;Serenbe." Serenbe.com. Accessed October 16, 2017. http://serenbe.com.

<sup>6</sup> Gonzalez, David. "New Deal Utopias." Lens Blog, 1330941656. https://lens.blogs.nytimes.com/2012/03/05/new-deal-utopias/.

prolific springs, and thin soils. Fault lines divert water miles between separate watersheds. Naturally susceptible to flash floods, unregulated development has exacerbated the already-quick runoff. Population growth has also drawn down the aquifer significantly, as Wimberley lacks reliable surface water or reservoirs and instead relies on a number of wells with little coordination between them.

The suburbanization of the areas west of I-35 has introduced a separate but related challenge of land management. Native American management regimes maintained an area of vast prairie; these were largely maintained by American ranchers into the 20<sup>th</sup> century. However, over the last few decades ranching has become less economically viable, and increased population density has made burns more infrequent. Thus by the 21<sup>st</sup> century, the Hill Country has become a woodland landscape, colonized by oak, mesquite, and ashe juniper. This shift in plant community has implications for hydrology, soil health, and animal habitats.

A land management strategy is essential on this site of over 300 acres. Because impervious cover targets are closer to 10%, much of the land will remain open space. Research by Texas A&M University<sup>7</sup> show that encroachment of ashe juniper and oak woodlands significantly impacts the water cycle. Increased leaf density and stem flow result in a larger percentage of water intercepted by trees and less making it into the soil. This is especially pronounced in smaller rain events. Therefore there is a strong relationship between land management, land cover, and groundwater recharge. The options for land management are myriad, from dryland agriculture to sculpture parks to managed nature preserves. Incorporating these into the culture of Wimberley and the planned development is essential.

A third challenge/opportunity is the premise of the studio to create in essence a greenfield subdivision without the pitfalls associated with this type of development. The Hill Country is rapidly urbanizing around a historic network of country roads, leading to poorly-connected communities and linear development. Amenities are widely spaced, properties are very large, and the topography itself makes radial or gridded city plans difficult. Is it possible to build a self-contained community of 250-500 households? Can it provide sufficient employment, education, and recreation to avoid adding hundreds more cars to Wimberley's narrow, winding roads? Or can it become part of Wimberley and improve connectivity? In the case of other exurban New Urbanist developments, they often become well-designed suburbs or spur additional development around them<sup>8</sup>. In the case of Serenbe, GA, "roughly half" of

<sup>7</sup> Thurow, Thomas L., and Justin W. Hester. "How an Increase or Reduction in Juniper Cover Alters Rangeland Hydrology | Texas Natural Resources Server." Juniper Ecology and Management. Accessed October 17, 2017. https://texnat.tamu.edu/library/symposia/juniper-ecology-and-management/how-an-increase-or-reduction-injuniper-cover-alters-rangeland-hydrology/.

<sup>8</sup> Skaburskis, Andrejs. "New Urbanism and Sprawl: A Toronto Case Study." Journal of Planning Education and Research 25, no. 3 (March 1, 2006): 233–48. https://doi.org/10.1177/0739456X05278985.

workers commuted to Atlanta, 45 minutes away<sup>9</sup>. Included in this challenge/opportunity is the imperative to retain the culture and character of Wimberley and the Hill Country.

# Case study area



<sup>9</sup> Hickman, Matt. "Serenbe: A down-on-the-Farm Antidote to Suburban Sprawl." MNN - Mother Nature Network, March 19, 2017. https://www.mnn.com/your-home/at-home/blogs/serenbe-down-on-farm-antidote-suburban-sprawl.

Wimberley, Texas is located in Hays County, roughly 38 miles southwest of Austin. Wimberley is home to hydrologic gems that draw thousands of visitors each year: Blue Hole and Jacob's Well.

The economy of Wimberley is largely based on tourism, the region being host to wineries as well as swimming holes. Cypress Creek specifically, home to both Jacob's Well and Blue Hole, is responsible for millions of dollars in tourist spending. The Hill Country has a \$5 billion per year tourist industry, \$20 million from vineyards alone, and \$80 million attributable to Wimberley's aquatic recreation opportunities. Nationally, Texas hosts more hunters and anglers than any other state, two hobbies that require large amounts of land and healthy ecosystems<sup>10</sup>.

Growth projections for Hays County are extreme, though we should not be surprised, as Central Texas in general has experienced extreme growth in the post-war era. From 1950 to 2000, the 17-county Hill Country grew over 300%, from 800,000 to 2,600,000 people. Future projections are grim as well, predicting the area to grow to 4.3 million residents by 2030. Hays County is projected to grow from under 100,000 people in 2000 to over 300,000 in 2030. In every scenario, there will be a deficit between water supply and anticipated demand<sup>11</sup>.

Compounding the issues of population growth, land-use change, and water resources is the lack of jurisdiction counties have over local land use. As mentioned in "Towards a Regional Plan for the Texas Hill Country", this is a core obstacle to sustainable planning for the future. And in "A Look at the Texas Hill Country", it is pointed out that land outside of incorporated municipalities and Extra-Territorial Jurisdictions (ETJs) covers roughly 90% of the Hill Country. There is a very real risk that much of the Hill Country will be covered in sprawling developments of single-family homes.

The site is located 1.2 miles west of Wimberley, TX on Ranch Road 2325. For the purposes of this studio, a boundary was drawn around the southern end of the Woodcreek North subdivision. Currently, the southern end of Woodcreek North is undeveloped, save for a few houses. The intent of the studio was to create a greenfield development proposal, so the property was assumed to be vacant except for existing roads.

<sup>10</sup> Pegasus Planning. "A Look at the Texas Hill Country: Following the Path We Are on Today through 2030." Hill Country Alliance, September 2008.

<sup>11</sup> Pegasus Planning. "A Look at the Texas Hill Country: Following the Path We Are on Today through 2030." Hill Country Alliance, September 2008.



The 323 acre site extends past Ranch Road 2325. It surrounds Jacob's Well Elementary on three sides. It covers the Wimberley ISD Baseball and Softball complex. It borders the Woodcreek North golf course, which now lies fallow and dormant. The site is largely lowland, and slopes north and east to form small drainages that flow to Cypress Creek. Multiple karst features lie within the project area, as well as the Jacob's Well fault line. One well has been drilled to serve Woodcreek North, managed by Aqua Texas. Aqua Texas also operates a wastewater treatment plant just to the southeast of the site.

# The Solutions





#### Description

The Wellspring seeks to redefine Hill Country suburban character by improving on three opportunity areas, named the "three-part vision." These parts are "net-zero water development,

connectivity, and appreciation of local art". Each of these things are generally deficient in status-quo suburban development, and mark The Wellspring's point of departure from the norm.

Net-zero water development begins with a water use estimate, for which the team picked three scenarios: 42, 52, and 80 gallons of water per day (gpd). Rainwater catchment was done on a per-home basis, utilizing a large but not atypical roof area to capture the rain. Additionally, "Communal Catchment" was utilized, gathering rainwater from pavilions, benches, covered parking, the town center, and playground canopies. In their thorough calculations, the team walks you through assumptions and calculations, leading to their conclusion: With ample roof area, 383 homes or 1,026 people can rely on rainwater to meet their potable water needs. This is true at 42 or 52 gpd, though not in the 80 gpd "low sustainability" scenario.

Connectivity is addressed by making a more compact community with a clear transect from dense center to rural edge, a departure from the model of homogenous large houses on large lots typical of the area. Proposed housing stock is diverse, with townhomes, cottages, single-family homes, and estates. In a subtle but effective move to develop a more urban character, garages are on the backs of homes with access to driveways. This creates a larger, more vibrant front yard, with a larger emphasis on the front porch with the garage out of the way. While de-emphasizing the car, this also creates a separate alleyway environment for social connections to be made and different sorts of activities to take place. The small commercial center is connected to homes by walkable streets and a greenbelt trail system. The commercial center, combined with a community center complex, facilitates interaction within the development.

Finally, "appreciation of local art" is foregrounded, justified by its inclusion in the Wimberley Comprehensive Plan and importance to the Wimberley community's identity. This takes the form of a sculpture garden, an artist residency program, and community space available for local artists. Precedents given are Storm King Art Center in New York, Umlauf Sculpture Garden in Austin, Texas, and Gibbs Park outside of Auckland, New Zealand. The proposed sculpture park, they state, will "create a new tourism experience for the region that will conserve land and limit impervious cover while building a source of revenue for the new community.

#### Assessment

The Wellspring team distinguished itself with their thorough pursuit of water neutrality. Water is gathered from diverse sources, including clever communal ones. The three scenarios are illuminating in how they help the audience understand how design, behaviour, and policy each influence what is possible. If only for the thoroughness of this analysis, one wishes for a more developed residential architecture. The potential for breezeways, porches, and other non-conditioned home spaces to be used for living as well as rainwater catchment is intriguing and exciting. Does Texas develop a rain-catchment vernacular, with new spaces defined under wide eaves?

Intra-community connectivity is strong, with alleyways, small, walkable streets, and a radial layout centered on the commercial community center. But in their stated goal of connectivity past the

site boundary, the team had less success. The team stayed largely within the given boundaries, limiting opportunities to make innovative connections outward. The Jacob's Well Elementary School and Wimberley ISD Baseball and Softball complex is largely buffered by the development and not engaged. Similarly, the dormant golf course presented an opportunity to continue the trail and greenbelt system, though this opportunity was not taken.

The design process was sound, including a thorough suitability analysis which helped the team protect karst features, riparian areas, and steep slopes. This led to an elegant site plan, the steeper slopes allowing for voids in the housing areas which became greenbelts. The question of what to do on most of the site, once there is enough housing, presented a compelling opportunity for The Wellspring to propose the sculpture park. This clever move simultaneously tapped into Wimberley's art culture, the need for an attractor and an identity for the community, and the need to fund land management on the property. This proposal was often undersold, as the work on water neutrality and the design of the rest of the community took precedent. But other towns such as Marfa, Texas, those in the Hudson Valley, New York and Taos, New Mexico can develop strong reputations and cultures based in the arts. A sculpture garden has the potential to elevate Wimberley to national significance in the arts, while giving art a role in land conservation.



Solution 2: The Ripple. Jake Greenfield, Aicha Lakhssass, Michael Simmons, and Joey Valenzuela

Description



The Ripple is named for the "ripple effect" that this proposal will have across the Hill Country, suggesting a paradigm shift driven by example. The Ripple is a "community growth model" that could be replicated near any Hill Country town. The concept is a new community based around "three key values: water consciousness, Hill Country Urbanism, and environmental protection." With a site plan evocative of the New Deal Greenbelt Town's logo, The Ripple is a decentralized, moderate-density proposal with a strong emphasis on the rural Texas lifestyle. The key value of water consciousness is expressed both in the architecture as well as in the landscape. Rainwater is captured for potable use by cisterns adjacent to residences. Rainwater from commercial areas is stored in a landmark water tower at the town center. Grey and blackwater are treated at the Aqua Texas wastewater treatment plant next door before being returned for irrigation. In the landscape, a system of drainages is overlaid on the site plan. This establishes a greenbelt system that operates independently from the street network as an amenity and piece of green infrastructure.

Hill Country Urbanism, as expressed in The Ripple, means small building footprints, minimum impervious cover, shared amenities, and innovative water infrastructure. A central corridor concentrates high-density housing, live-work units, a farmers' market and grocery store, in a triangle block surrounding a community garden. Adjacent are shared stables for horses, an amenity typically only available for the wealthy or those with multi-acre properties. Here, 487 housing units accommodate 1325 people in mostly attached units. 4% of the housing is single-family, the rest being townhomes, duplexes, triplexes, and multifamily homes.

Environmental protection is intertwined throughout the plan and inherent in the design. Primarily, "the key objective is to protect open land." The proposal sits lightly on the land, leaving large expanses of open space free of development. Aforementioned green stormwater infrastructure mitigates the impervious cover that is proposed.

#### Assessment

The Ripple fits more units than any other team on minimal land by pursuing density. This is unusual by 21<sup>st</sup> century standards, but early Hill Country towns were often developed at higher density, with residences above stores. The perspectives drawn by the team show a Hill Country vernacular a resident of Wimberley, Fredericksburg or Llano would recognize.

The key value of water consciousness is not tested with rigor, and The Ripple is not water neutral. However it still catches nearly half of its potable water from rainfall, a large improvement from the status quo. The high density of the housing increases population without increasing roof surface area, which is partly responsible for falling far short of water neutrality.

The Ripple is a very marketable concept for Hill Country development that minimizes its footprint and maximizes shared spaces. The case for Hill Country Urbanism is made strongly with the integration of horses and agriculture with high-density development. Open land is valued for its use as a shared amenity, and this is shown in the desire to leave much of it open, though framed neatly by the built environment. It's an intriguing model, showing an intensification of land use that could be replicated within and near Hill Country towns. The desire to live in the Hill Country is related to the quality of open space, though this is incrementally lost when land is broken into ¼ acre parcels. The Ripple shows us an alternative. Solution 3: Arroyo Crossing. Daniel Alvarado, Sarthak Gupta, and Windel Desir



#### Description

Arroyo Crossing takes a bold a regenerative approach to Hill Country Urbanism, framing the proposal as a hub of innovation in technology and lifestyles. The site is organized along five programmatic axes: education, commercial, multifamily, housing, and conservation.

Site design is responsive to the biophysical context of the site. The northern half of the site, above Jacob's Well fault, is conservation. The natural drainages are enhanced and rebranded as "arroyos," including Arroyo Madre, running through the core of the development. Framing the arroyos is the residential and commercial development.

An assortment of multifamily, attached single family, and detached single-family housing types make up 357 total units, housing 1200 residents. Notably, the housing is atypically small for Texan standards, ranging from 500 sf apartments to 1800 sf single-family homes. This decision is consistent with the team's desire to take on the resource-inefficient large homes typical of suburban development.

Net-zero water use is achieved through a closed-loop system that begins with rainwater harvesting on residential and commercial roofs, covered walkways, and gazebos and underground storage. The daily water use average is 50 gallons per person per day. All buildings reuse greywater. Blackwater is treated at the Aqua Texas Waste Water Treatment plant and returned in a purple pipe system for irrigation and establishing a base flow in Arroyo Madre.

The technologies used in water and ecosystem management are researched and showcased at the Hill Country Living Center. Inspired by the Lady Bird Johnson Wildflower Center, this is imagined as a "nerve center" of the community, providing expertise and knowledge on:

- Regenerative land management staff and volunteers
- Rainwater harvesting system management staff
- Integrated with Jacob's Well Elementary for environmental education
- A permaculture farm irrigated by recycled wastewater and maintained by students
- Ecotourism opportunities in the conservation zone to learn regenerative land mgmt practices
- Retail opportunities for rainwater harvesting and native plant purveyors
- Creates jobs restoring and managing the environmental systems

Forming a corridor of activity is commercial space and low-cost "art barns" for use by local artists to work and showcase their art. Located strategically on Ranch Road 2325, these art barns structure the community's shared vocation and engage more directly with Wimberley.

#### Assessment

Arroyo Crossing took an unapologetic approach to redefining Hill Country living, from proposing small living units to creating a communal, shared goal in the Hill Country Living Center. The inclusion of a research center indicates the team's knowledge that designing communities in the Hill Country will be a regenerative and open-ended process, and that Arroyo Crossing may be the first iteration of many. This proposal is probably the most radical, and might be the most self-selecting in terms of those who choose to reside there. Then again, the team may have hit upon a niche in the housing market that thus far no developer has been bold enough to fill.

The size of the residential units is perhaps the most thought-provoking, because it is the biggest threat to this proposal's hypothetical economic viability. Who would buy these tiny houses? Could you get any return on investment from micro-apartments in Wimberley? But it forces a conversation about how much conditioned space is actually needed, and if sheer square footage is the most important metric of residential development. It also opens the possibility of creating more outdoor covered spaces, alluded to in mentions of porches and covered walkways.

Finally, Arroyo Crossing displays a sensitivity to the existing community and its context. Issues like connectivity are deftly addressed by engaging fully with Rach Road 2325 and appropriating it as a main artery, and connecting directly to the Jacob's Well Elementary School. Wimberley culture is given a place to thrive in the art barns and commercial area. And issues such as affordability are reconciled by eschewing large houses and offering a range of economical options for those on a budget who might not need a large home.

#### Discussion

#### 250- 500 units of housing - single-family, multi-family, townhome

Each of the proposals met this requirement, from a high of 487 in The Ripple to 383 in The Wellspring, and a low of 357 in Arroyo Crossing. Sizes and typologies varied, with The Wellspring being most generous and Arroyo Crossing being the most minimal.

#### Energy and water efficient commercial/retail space including live/work spaces

Water efficiency was a hallmark of each proposal. Each team designed a variation on a rainwater capture system. The Wellspring supported their claim of water neutrality with rigorous calculations. Both Arroyo Crossing and The Ripple engaged the nearby Aqua Texas WWTP to return treated water for non-potable uses.

Energy efficiency was infrequently mentioned, and took a backseat to water efficiency. There were opportunities for solar and wind energy being integrated into the designs of the proposals, but none was. This is more an indication of the focus of the studio rather than any negligence of the students. Walkable mixed-use town center, village, or hamlet with green streets

Each team developed a core to their new communities with some commercial space, higherdensity residential, and civic amenities. These took different forms in each proposal. The Ripple established a linear town center, drawing inspiration from historic Hill Country towns with dense, linear development along regional market roads. The Wellspring proposed a widely-spaced radial grid with the town center at the core, set back some distance from Ranch Road 2325. Similarly, Arroyo Crossing pursued a more deliberate radial arrangement, though the town center occupied one of the radial spokes along the Ranch Road. The radial arrangement seemed to be informed by topography, which had drainages and ridges arranged in a loose radial pattern. Whether to engage or set back from the Ranch Road was a continual discussion in the studio, though engaging the busier roads is a stronger step towards Hill Country Urbanism.

#### Community Space including meeting space and non-profit office space

Community space became an opportunity for differentiation between the proposals. The Wellspring featured a community center within a central district, near art galleries and studios. The Ripple did not feature a community center and took a more commercial approach to developing a town center, though it did include an equestrian hub at the core of the development, pairing shared recreation and rural Texas culture with community space. Arroyo Crossing made the strongest case for the community center, not adding it in as a requirement but making it a core element of the community. Art is further

#### Affordable housing and community land trust

Affordable or subsidized housing was not addressed directly. However, in diversifying housing stock and introducing denser and smaller units, each group provided more affordable options. All groups proposed attached units and higher density. The Wellspring stopped at 2400 sf townhomes, while The Ripple and Arroyo Crossing pursued more density in the form of multifamily development.

No group developed the northern half of the property, and thus had to invent a way to maintain it. While community land trusts were not specifically utilized, more creative ideas emerged. The Wellspring proposed the sculpture garden, which would provide revenue for the maintenance of the land. The Ripple engaged equestrians, users of open space with an interest in their sustainability. And Arroyo Crossing utilized the Hill Country Learning Center to turn the whole site into a research station. Importantly, neither The Wellspring nor Arroyo Crossing proposed a land management scheme that can be scaled up or replicated easily in the Hill Country. Sculpture gardens and research stations are programs that operate on regional, not local scales. The Ripple's engagement of a specific lifestyle demographic is much more replicable, because it allows residents to participate in a more recreational and habitual way. Equestrians across the United States have proven to be a powerful lobby group when it comes to preserving land for horseback riding.

#### Climate appropriate agricultural production (micro-farm, permaculture) and gardens

Agriculture was mentioned by all proposals, and a community garden featured more prominently in The Ripple. However, pursuing this with any conviction was discouraged by the environmental realities of the site. The Hill Country offers marginal agricultural land, and agriculture is in direct conflict with water neutrality. That said, The Ripple placed their community garden in the center of the development, mitigating its small area with a big presence.

# Open space network with parkland, trails and diverse natural habitats that promote clean and abundant aquifer recharge

The studio was blessed with ample open space from the beginning, the site being 323 acres for a required 250-500 units of housing. All groups concentrated development at higher-than-average densities, leaving the large northern area largely untouched and incorporating generous green spaces into the communities. Green stormwater infrastructure was utilized by each group to handle runoff from impervious surfaces and improve water quality. All groups included a secondary active transportation network, often paired with the greenbelts and overlaid on the road network.

#### Conclusions

The first Jacob's Well studio produced three significant proposals, each testing variations on suburban development while setting an example for future developments to follow. Even the moves considered more conservative by designers and planners are bold by developer standards.

Significantly, water neutrality proved to be a difficult challenge for each team. The goal was a highly technical one, requiring planning as well as architecture sensibilities, combined with the uncooperative Texas climate. Furthermore, as student Jake Greenfield pointed out, Hays County can get

as little as 11" of rain in a year. Texas' yearly rainfall totals can vary widely, though the class often relied on averages, not a worst-case-scenario model. Were the calculations performed for a drought year, water neutrality would prove to be impossible.

Is this a problem? No community is truly water-neutral, all rely on some degree of upstream catchment area for surface water resources. Cities in the arid southwestern United States pipe their water hundreds of miles from source to faucet. Future studios may want to frame the problem differently; the main challenge was the direct link between Woodcreek North's water use and the decrease in Jacob's Well's flow. Alternative sources of water could mitigate this, water-neutral or not. Ultimately solving the issues relies on a policy approach on the watershed or aquifer scale, not a design approach on a subdivision scale.

While the students in the studio were all in the Community and Regional Planning program at UTSOA, the studio was very much design-based. There were few policy-based proposals. This hindered each team, confining them to landscape architecture, urban planning and architecture, disciplines which the students had less familiarity with. When it came down to specific issues in each, such as residence time of runoff in detention ponds or how to design dense housing with wide roofs, the students were less adept at finding solutions.

Early in the development of this studio, there was discussion of it being a more policy-based retrofit proposal for the suburban development already planned or built in Woodcreek North. This could be a fascinating studio with wide-ranging implications as well. A deployable model could be generated for retrofitting single lots or cul-de-sacs with rainwater catchment. Infrastructure improvements could improve runoff quality and water re-use. The golf course would be a central target for regenerative development and landscape infrastructure. The entire development could institute policies for water conservation to limit the effects on Jacob's Well. And this could be a scalable proposal, applicable to subdivisions across the Hill Country.