

# SEREP

SOUTHEAST EQUINE RESEARCH & EDUCATION PARTNERSHIP

A grayscale architectural rendering of a modern building complex. The scene features a large, multi-story building with a prominent gable roof on the left. In the foreground, a white horse stands on a paved path. Several people are depicted walking and standing in the courtyard area. The background shows more buildings and trees under a cloudy sky. The overall aesthetic is clean and professional.

**Envisioning  
the Future:**

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The Southeast Equine Community  
& Research Center





Work presented in this book was completed by an interdisciplinary research team including faculty and students from NC State University from February 2017 to December 2018. It complements the previous two interim reports presented through the duration of this project. Previous reports can be downloaded from ( <https://serep.wordpress.ncsu.edu/updates/> ).

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# Foreward

Polk County, NC has a rich and dignified history in the equestrian sport dating before its serving as the training ground for the 1956 Olympic Equestrian Team. Venues such as Harmon Field and FENCE have hosted thousands of equestrian competitions in the disciplines of dressage, cross country, show jumping and others. The Block House Steeplechase has been a mainstay of equestrian culture in Polk County for many years and many equestrian farms and businesses dot the landscape of Polk, Rutherford, and surrounding counties in two states.

In 2015, the profile of the equestrian sport was magnified in the area with the advent of Tryon International Equestrian Center (TIEC), an international venue attracting international talent. Some questioned what would happen to existing venues and what would this mean to the amount and nature of growth in Polk County and surrounding areas.

The innovative minds of Polk Countians began to engage. Craig Hilton, a citizen of Polk, opined that TIEC was to equestrian as BMW is to automotive. He observed that Clemson University had created ICARS (Clemson University Center for Automotive Research) in the Greenville- Spartanburg area to conduct comprehensive automotive research and to leverage the presence and reputation of BMW and Michelin. With ICARS only 35 miles away, why couldn't our area propose a comparable research center in equine and animal science?

Bill Miller, former Polk County Superintendent of schools, discussed with an Isothermal Community College (ICC) official his concern for existing venues like Foothills Equine and Nature Center (FENCE) and Harmon Field and questioned their long term viability given the impact of TIEC and its growth in activity and facilities. It was suggested that perhaps part of FENCE could be made into an educational campus. These discussions morphed into the idea that perhaps a multidisciplinary facility could be developed, similar to ICARS or the Kannapolis NC Food Research Center, wherein multiple universities would engage in research in collaboration with private researchers from major companies and with Isothermal Community College having a presence to train in technical fields and assist with the operation of the facility and its ongoing activity.

Libbie Johnson, a leader in Polk County and the Equestrian Community, was supportive and encouraging of the idea, as were others, as long as it was compatible and aesthetically pleasing with the bucolic nature of Polk. It was emphasized by all that it should complement, and not compete with, existing businesses. These discussions and more led to Isothermal seeking a grant to conduct a study to conceptualize such a research center in the area and to hypothesize how such a center would look, how it would interface

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In 2018, the Tryon International Equestrian Center (TIEC) hosted the World Equestrian Games (WEG) which was attended by seventy countries. TIEC is consistently attracting international traffic and the increased activity has grown the equestrian activity in the area. TIEC and the Foothills Equestrian and Nature Center (FENCE), and Green Creek Farm (proposed venues for the SEREP) are 80 miles from Clemson University, 140 miles from the University of Georgia, and 150 miles from the University of Tennessee. These institutions and more have animal science programs which may be potential partners.

and coordinate with existing facilities; how it might attract researchers and academics to the area; while at the same time act as a catalyst for students of Polk and Rutherford and in the surrounding area to further their education and to stay in the area to add to their own quality of life and that of the community.

With that backdrop, ARC graciously and generously gave Isothermal a grant to engage in such a study and Isothermal in accordance with its proposal in the grant application, contracted with NC State to do the study. The contract hypothesizes that the SEREP would have as its primary focus equine research at the university level using a multiple university/collaborative model and also, a component of technical training to be conducted by ICC which would be complementary to the research facilities and the equine economy and related industries in the area. The contract defined a scope of work and established guidelines for the study.

The study would culminate in conceptual drawings and identify, in general terms, financial resources as well as any public/private partnerships which might be formed to take advantage of the SEREP. During the course of the study, it was suggested that such a project be proposed in stages in five year increments over a twenty-year period of time in order to assure all efforts were to scale and sustainable into the future with each phase building upon the other. What follows is the final product from NC State, but not the final work of the committee, which was formed to assist with the grant.

The Committee plans to continue its work to refine proposals and adapt the suggestions of NC State to the original vision and its evolution as dictated by changing circumstances. In the meantime, Isothermal Community College is proceeding with the development of a curriculum in equine studies for an associate of science degree and articulation agreements with four year colleges and universities. Also, Isothermal is proposing a new human services therapy degree based on the horse as a service animal. Physical facilities such as a barn, therapeutic riding rink, and other ancillary facilities are being built, or are proposed to be built, on ICC's main campus. This can fill a void and initiate the process during this deliberative period.

The work of Isothermal in initiating these programs is a step toward the ultimate vision. Time and success, or lack thereof, will dictate whether the scale of the process will be sufficient to support the vision and the timeline for implementation.

These are things the committee will continue to address, assimilating the information derived from the study with its own knowledge and investigation.

**Walter H. Dalton**

President, Isothermal Community College  
January 2019



# Executive Summary

The Southeast Equine Research and Education Partnership (SEREP) arose from an intentional community-university partnership arrangement between North Carolina State University and select organizations in Rutherford/Polk counties in the Isothermal region of Western North Carolina. Pursuant to a subcontract for an Appalachian Regional Commission grant led by the Isothermal Community College, an interdisciplinary research team from NC State University was formed to pursue the scope of work during a period of 18 months. Our team engaged with a number of community stakeholders and collected a variety of data to determine the feasibility of developing an equine research and education center. The primary goal was to determine how to take advantage of the long standing but burgeoning equestrian culture and economy in the region in a way that would serve the needs of existing communities, attract investment, create new businesses and jobs, and stimulate university-level research opportunities. This final report presents our findings from the study and provides a conceptual framework for a center focused on horse, human, and environmental health.

The proposed center would accommodate the equine-related research needs of local horse owners, farms, and businesses; private industry; and North Carolina State University. A business model and physical design scenarios are provided in this report that are community centered, economically viable, and environmentally sustainable. Our research determined that one of the more promising areas of equine-related research, and one for which there are few other centers in the United States, is in equine assisted activities (e.g. riding, learning, psychotherapy). In addition, the agricultural and technology needs of the local areas as well as the state of North Carolina would be well-served by research in the production of premium horse hay and other forages, manure and pasture management, and the development of a variety of agribusiness opportunities. Finally, a center would build on the increased equestrian-related visitors to the region and provide spaces for incubating small businesses and educating local communities and tourists on all aspects of the historical and present day relationship between horses and humans.

Economic and community development in rural areas is always challenging. We have been inspired by many in the region who have long believed that the horse culture and economy there has been underappreciated. Our research affirms the view that local equine culture and economy can be further leveraged to contribute to economic, cultural, and community development that will benefit the local area as well as the entire state of North Carolina, and beyond. We are confident this report can contribute to the next steps in growing the equine culture and economy in Western North Carolina.

**NC State SEREP Research Team**

January 2019







# Introduction and Overview

The Southeast Equine Research and Education Partnership (SEREP) extends from a contract between North Carolina State University (NC State) and Isothermal Community College via a grant the latter received from the Appalachian Regional Commission. In 2016, the office of University Outreach and Engagement at NC State began a community-university partnership initiative in Polk and Rutherford counties to identify opportunities for the university to engage in intentional and collaborative projects that would significantly address community identified needs. Although a number of economic analyses and reports pointed to economic development opportunities in the region related to agriculture, tourism, and industrial activity (NC Isothermal Region C, 2017; Region C Workforce Development Board, 2016), for a number of reasons, many in these two local communities believed there were opportunities to be explored that could take advantage of the equestrian assets in the region. Moreover, given the economic contribution of the horse industry to the economy of North Carolina, which includes \$2 billion per year and 36,000+ jobs (American Horse Council Foundation, 2018), a focused initiative that connects equine activities across the state would provide added value.

*The successful implementation of the future Southeast Equine Community and Research Center and its mission requires a strong and sustainable vision, partnerships, research & educational focus, and physical environment that effectively support and address the equine related needs in the region.*

SEREP arose out of these efforts and was intended to explore the feasibility of a multidisciplinary Equine Community and Research Center. The center would build on the historic strengths of the region embedded within its equestrian culture and economy as reflected in the large per capita number of horse owners and farms, equestrian businesses, and recreation and competition centers such as the Foothills Equestrian and Nature Center (FENCE). Further acknowledgement of these strengths was provided when in 2014 the Tryon International Equestrian Center (TIEC) opened what has become one of the premier horse competition parks in the United States. And more recently, TIEC hosted the 2018 World Equestrian Games, the largest horse event in the world, and the largest sporting event in North Carolina history.

The SEREP research team included a multidisciplinary group of researchers in the social sciences, tourism, design, and natural resources, and, in consultation with faculty in animal science, agriculture and veterinary medicine. The goal of SEREP was to provide a conceptual and physical design for a center where private industries, local organizations and residents, and regional academic institutions could work in partnership to enhance the regional equine-based economy and culture. The broader, and admittedly ambitious long term vision of the local communities, is for a facility and farm that would become a world-class center for innovative equine related research and education. Our NC State team began our work with this vision in mind.

Over an 18 month period beginning in March 2017, the NC State SEREP team consulted with a broad range of local stakeholders across both public and private sectors of the isothermal region; identified and analyzed comparable equine research and education facilities across the country that were connected to research universities or the equestrian industry; surveyed and interviewed regional equine businesses and horse owners; reviewed research, education, and training programs that would fulfill regional and statewide needs; and generated physical design scenarios that would be economically and environmentally sustainable, able to generate local business development and jobs, and have the potential to become a world-class center for equine related research that would be significantly connected to the high technology capacity of NC State University and other higher education institutions in the region.

The following sections provide details in each of these areas.



Figure 1. Stakeholder meeting hosted by Isothermal Community College.



Figure 2. Site visit to CORRAL, Cary NC - Therapeutic Riding





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# The Southeast Equine Community and Research Center (SECRC): Proposed Conceptual Model

*A center enabling the collaboration between academia, private industry and local communities for the enhancement of the local equine-based economy's contribution to equitable and sustainable regional development.*

The findings from our previous reports (Brookins et al., 2017; Morais et al., 2018) point to the viability of an equine community and research center to be connected to and located within the Isothermal region. The proposed Southeast Equine Community and Research Center (SECRC) would include a multidisciplinary *research hub* that would leverage and support the local equine ecosystem and provide opportunities for innovative research, particularly related to the health of horses, humans, and the environment; a *community village* that provides amenities to enable short and long-term stays for researchers and athletes; and a *business hive* that engages with visitors and community members and enables grassroots equine-based economic development.

Research Hub	The Village	Local Business Hive
<ul style="list-style-type: none"> <li>• Equine health and sciences lab</li> <li>• Smart rural communities lab</li> <li>• Equine manufacturing lab</li> <li>• Equine-assisted therapy lab</li> <li>• Equine-based agribusiness lab</li> </ul>	<ul style="list-style-type: none"> <li>• Research and athlete lodging</li> <li>• Horse boarding barns</li> <li>• Food services marketplace</li> <li>• Large group multi-function hall</li> </ul>	<ul style="list-style-type: none"> <li>• Visitor and community concierge</li> <li>• Local farmers and artisans market</li> <li>• Regional business incubator</li> <li>• Equine history and science museum</li> </ul>

Figure 3. Proposed conceptual model for SECRC.

# The Business Case for SECRC

In this section our team drew from findings reported in the previous reports as well as from the team's collective field experience in the study region and on our multi-disciplinary expertise to develop concise business models for each unit. We employed a Business Model Canvas approach to generate and illustrate these business models. Below is an illustration of the content in these Business Model Canvases.

## Business Model Canvases

When developing an organization's business model, it is thought through the following flow of questions and variables:

**1. Customer segments:** The first focus of the business model development process is to identify to whom the organization is creating value. There are likely to be many types of market segments, so in this step it is important to single out the most appealing/important segments.

**2. Unique value proposition:** A crucial next step is to carefully identify the value that the organization is creating and delivering to each customer segment. Value is created when we solve a customer's problem or meet an unsatisfied need. Unique value propositions are best articulated when they identify an unfair advantage of the organization in contrast with its competitors.

**3. Channels:** The following focus should be on identifying which channels will be most effective to communicate with the various customer segments. Additionally, in each phase of the interaction with customers (e.g., awareness, purchase, after sales) different channels may be necessary.

**4. Customer relationships:** Next it is important to characterize the type of relationship that the organization needs to nurture with its customers. Some segments will prefer short transactional exchanges while others will require long-term costly and profitable membership approaches.

**5. Revenue streams:** Calculating the value customers are willing to pay is crucial to the business model. The revenue streams flesh out how and through which pricing mechanisms the organization is capturing value.

**6. Key activities:** The organization then must identify key communication, production and relational activities that support the plan.

**7. Key resources:** In addition to the organization's operations, some resources may be critical to the organization's success. These resources may be physical like facilities, but they may include intellectual property, social capital with partners, and access to human resources.

**8. Key partners:** Success and impact often requires collaboration, so in this step of the business model development it is time to list key partners of the organization. These partners may contribute with resources, or they may be suppliers, or they may help reduce risk or make the organization connect better with the local community or with customer segments.



**9. Cost structure:** Lastly it is necessary to enumerate the most significant costs inherent to the proposed business model. The most expensive resources should be identified, as should costly key activities and customer relationship needs.

In sum, the canvas makes it possible to map out the entire business model in one image, which is useful to both start-up entrepreneurs and the most senior business planners. However, it is not sufficient to just enumerate the nine building blocks, given that it is equally important to map them out on a pre-structured framework, which has been termed business model canvas (Osterwalder et al., 2015). The tool has helped entrepreneurs mapping, discussing, designing and inventing new business models, and is widely taught at entrepreneurship programs at the college level.

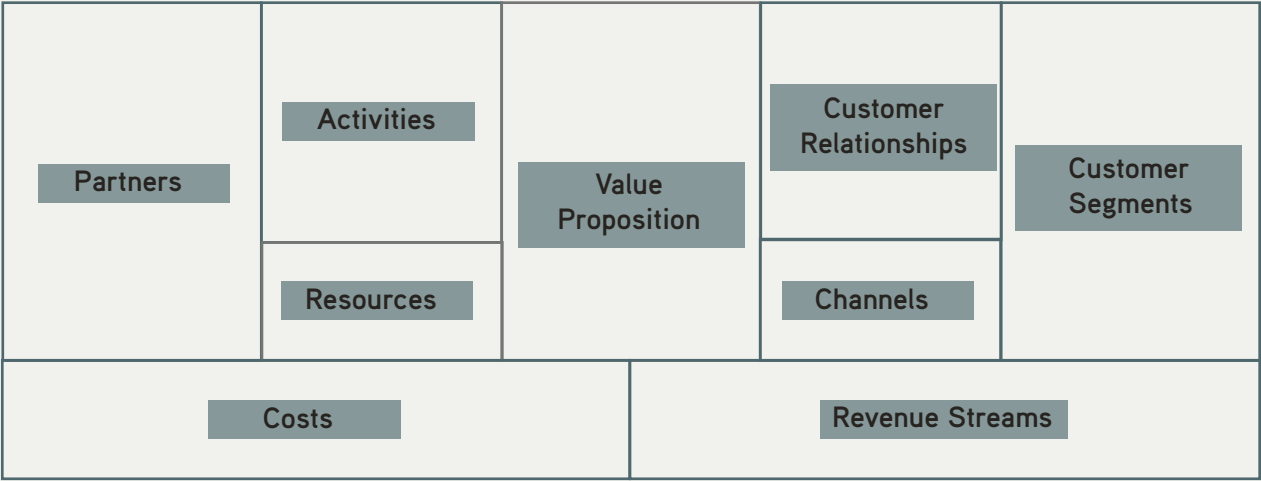
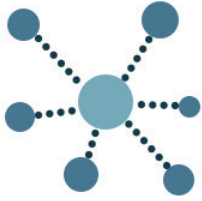


Figure 4. Business Model Canvas.



## Research Hub

The proposed research complex is envisioned as a “hub” that brings together faculty, students, postdocs and research staff from various disciplines and institutions to address major challenges and research questions relevant to areas in equine sciences and equine veterinarian medicine, equitable and sustainable development; equine manufacturing; equine-assisted therapy, and equine-based agribusiness. This hub will aim to foster multidisciplinary research to support the regional and local equine ecosystem; to create innovative and progressive partnerships among universities, industry and community; and to maximize local opportunities by integrating research, teaching, and outreach programs. The physical space will accordingly aim to support interactions among research teams that cycle in and out of the center. Hence, the research facilities will be designed with maximum flexibility accommodating labs, classrooms, workspace and meeting areas to enable interdisciplinary collaboration across research teams.

### Equine Health & Sciences Lab

*A flexible use wet lab facility for equine sciences and veterinary medicine research; with a residential research herd as well as structural access to a large network of private horses in the region; with a small permanent staff, and earning revenue from fees to research grants.*

This facility will include flexible use space for equine sciences, veterinary health, and human health research. It should also include offices, active learning spaces, and wet labs. These spaces will need to have access to horse fields and lodging, and be connected with the Village.

Research teams will pay for facility rental and for the boarding of a research herd. These fees will cover the costs of utilities, building maintenance, and on-demand animal care staffing.

# Equine Health & Sciences Lab

## Business Model Canvas

<h3>Key Partners</h3> <ul style="list-style-type: none"> <li>• NC State University (CVM, CALS)</li> <li>• Isothermal Community College</li> <li>• Private horse owners in the region</li> </ul>	<h3>Key Activities</h3> <ul style="list-style-type: none"> <li>• Rental of space</li> <li>• Rental of research herd</li> <li>• Liaison with private horse owners</li> </ul>	<h3>Value Proposition</h3> <p>For equine sciences and equine veterinarian medicine research teams, who struggle with limited access to experimental units (horses), SECRC's Equine Health &amp; Sciences Lab is a flexible use wet lab facility that offers a residential research herd as well as structural access to a large network of private horses in the region.</p> <p>Unlike traditional equine research labs, the Equine Health &amp; Sciences Lab offers an expandable research herd by utilizing private horses when necessary to meet specific research needs, which leads to increased efficiency and reduction in costs.</p>	<h3>Customer Relationships</h3> <ul style="list-style-type: none"> <li>• Researchers are tenants of the facilities for the duration of the contract</li> <li>• Researchers pay to use horses from the residential herd</li> <li>• Researchers can buy access to private horses owned by network of private residents in the region</li> </ul>	<h3>Customer Segments</h3> <ul style="list-style-type: none"> <li>• Research teams from universities in the Southeastern US</li> <li>• Corporate research teams</li> </ul>
<h3>Key Resources</h3> <ul style="list-style-type: none"> <li>• Lab space</li> <li>• Lab equipment</li> <li>• Boarding of residential research herd</li> <li>• Relationship with a regional network of horse owners</li> <li>• Staff: administrative, research herd caretaker</li> </ul>		<h3>Channels</h3> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Acknowledgement of SECRC in research publications and presentations involving the lab</li> </ul>		<h3>Costs</h3> <ul style="list-style-type: none"> <li>• Employee salaries (administrative staff, maintenance)</li> <li>• Legal</li> <li>• Utilities</li> <li>• Equipment updates</li> </ul>
<h3>Revenue and Benefits</h3> <ul style="list-style-type: none"> <li>• Fees from rental of space for research</li> <li>• Fees from rental of research herd</li> <li>• Fees for access to private horses</li> <li>• Fees for use of facility for Extension and education programs</li> </ul>		<h3>Revenue and Benefits</h3>		

## Smart Rural Communities Lab

*A central hub for a geographically dispersed network of public institutions and community members involved in data collection and the co-creation of solutions for the region's equitable and sustainable development; with office space for a small staff; earning revenue from fees to research grants, and technical services to local governments.*

This lab will provide access to a network of community members involved in data monitoring and available for social science and equine sciences research. The physical facilities' needs are limited to office space but the lab will require significant server and/or cloud space for data storage. An initial set of field equipment (e.g., water quality sensors) will be required and increase over time through externally funded projects.

Research teams will pay fees for access to this geographically dispersed network of participants for their projects. Research teams might pay for access to data collected by this lab. Local government might pay for the provision of dashboard indicators of community health, environmental health and economic development.

Costs will include data management and the staffing of a communities research liaison.

# Smart. Communities

# Smart Rural Communities Lab

## Business Model Canvas

<h3>Key Partners</h3> <ul style="list-style-type: none"> <li>• Region residents</li> <li>• Civic groups</li> <li>• Local public agencies</li> <li>• Isothermal Community College (facilitate connections with community stakeholders and policy-makers)</li> </ul>	<h3>Key Activities</h3> <ul style="list-style-type: none"> <li>• Data collection and management</li> <li>• Coordination of data collection partnerships with residents, civic groups and public agencies</li> </ul>	<h3>Value Proposition</h3> <p>For researchers, who need access to multi-faceted system-wide just-in-time data, SECRC's Smart Rural Communities Lab is a central hub coordinating continuous data collection in cooperation with local residents and agencies that offers access to large longitudinal multi-disciplinary system-wide data sets.</p>	<h3>Customer Relationships</h3> <ul style="list-style-type: none"> <li>• Researchers buy access to data sets</li> <li>• Researchers buy long-term involvement in the lab</li> <li>• Public agencies buy technical reports and advice to inform strategy and policy</li> <li>• Networking between researchers and public agencies will be facilitated</li> </ul>	<h3>Customer Segments</h3> <ul style="list-style-type: none"> <li>• Research teams from universities in the Southeastern US</li> <li>• Public agencies devoted to equitable and sustainable development</li> </ul>
	<h3>Key Resources</h3> <ul style="list-style-type: none"> <li>• Equipment for automated field data collection (e.g., water quality monitoring robots)</li> <li>• Data storage infrastructure</li> <li>• Staff: community partnerships and data science research associate</li> </ul>	<p>Unlike current data sets about rural communities that are time-limited and discipline-specific, the Smart Rural Communities Lab offers large longitudinal multi-disciplinary system-wide data, which enables multi-disciplinary research and policy to effectively address the complex challenges facing rural areas.</p>	<h3>Channels</h3> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Acknowledgement in research publications and presentations involving the lab</li> </ul>	
<h3>Costs</h3> <ul style="list-style-type: none"> <li>• Employee salaries</li> <li>• Compensation of participating residents, civic organizations and local public agencies</li> <li>• Server and/or cloud space for data storage and management</li> <li>• Field equipment update</li> </ul>				<h3>Revenue and Benefits</h3> <ul style="list-style-type: none"> <li>• Sale of data sets</li> <li>• Fees from research fellow memberships</li> <li>• Sale of technical reports</li> </ul>

## Equine Manufacturing Lab

*A multi-purpose facility for materials testing and applied engineering research, serving a regional consortium of equine manufacturing industry members; earning revenue from consortium membership fees, testing services, and fees to research grants.*

This facility will include a multi-purpose lab conducting materials testing and applied engineering research. The facility is envisioned as a large open space adaptable to various types of projects.

Principal Investigators will include facility rental fees in their grants. Equine manufacturing companies in the region (e.g. footing, horse trailer manufacturers) may also outsource R&D projects to this lab with contracts or in the form of a long-term consortium.

Costs will include facility utilities and maintenance, as well as flexible animal care staffing. Basic equipment may be needed and additional specialized equipment may be included in grants.

# Manufacturing.



# Equine Manufacturing Lab

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• NC State (COE)</li> <li>• Isothermal Community College (SBDC) (connections with SMEs; collaboration in grants)</li> <li>• Local equine equipment industry consortium</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Rental of space</li> <li>• Facilitation of partnerships between local equine manufacturing industry and research teams</li> </ul>	<p><b>Value Proposition</b></p> <p>For product research and development teams from local SMEs, who can't afford in-house test facilities, SECRC's Equine Manufacturing Lab is a multi-purpose lab facility for materials testing and applied engineering research that offers a large open space adaptable to various types of projects, access to qualified research teams and a broad spectrum of basic and specialized equipment.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Researchers are tenants of the facilities for the duration of the contract</li> <li>• Networking between researchers and members of the industry consortium will be facilitated</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Research teams from universities in the Southeastern US</li> <li>• Product research and development teams from local SMEs</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Lab space</li> <li>• Lab equipment</li> <li>• Staff: technical equipment operation and maintenance</li> </ul>		<p>Unlike in-house test facilities, the Equine Manufacturing Lab does not require high initial investment and operational costs, which leads to a reduction in R&amp;D expenditures and accelerates business innovation.</p>		<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing</li> </ul>
<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Employee salaries (administrative staff, maintenance)</li> <li>• Legal</li> <li>• Utilities</li> <li>• Equipment updates</li> </ul>		<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Fees from rental of space to research teams working on contracts</li> <li>• SBTDC grants to subsidize R&amp;D services to local industry consortium</li> <li>• Fees for use of facility for education programs</li> </ul>		

## Equine-Assisted Therapy Lab

*An equine-assisted therapy indoor/outdoor facility designed to optimize and observe the structured interaction of humans with horses for the study of their effect on human health; with a small residential research herd as well as collaborations with a network of therapy programs in the region; earning revenue from therapy services to public and private clients as well as fees from research grants.*

Over the last 30 years equine assisted therapy has evolved into a dynamic therapeutic option (Bizub, Joy & Davidson, 2003). Utilizing equines in therapeutic settings has garnered much national and international attention as the application of, and outcomes associated with, horse and human interaction becomes a more common intervention for the treatment of a variety of physical, cognitive, and mental health issues. Although research in this area is emerging, it spans the human experience, including: victims who have experienced sexual violence (Kemp, Signal, Botros, Taylor & Prentice, 2014), veterans (Lanning & Krenek, 2013), children (Lentini & Knox, 2015), individuals with PTSD (McCullough, 2011), at-risk youth (Burgon, 2011; Maujean et al. (2013)), people with autism (Anderson & Meints, 2016), people with cerebral palsy (Zadnikar & Kastrin, 2011), court involved youth (Hemingway, Meek & Hill, 2012), patients with eating disorders (Christian, 2005) and business executives (Kelly, 2014). Research in these areas would be a key component of the SECRC, directly benefit the equine assisted activities in both the region and North Carolina, and has the potential to become a world leader in research on Equine Assisted Activities. See Appendix # for a more thorough review of this research.

This lab will include indoor space for interaction between therapists and their human participants, paddocks specially designed for the participants' interactions with horses, and easy access to horse boarding areas where participants can care for the horses. The facility should also have easy access to the public areas of the Hive so that family, friends and public can observe the programs.

Principle Investigators will include facility rental fees, the boarding of a therapy herd, and perhaps human participant incentives in their grants. The lab can generate programming revenues when providing services to local government institutions (e.g., school system, juvenile penal system), or to other organizations (e.g., wounded warrior program). Additionally, many equine-assisted programs have a strong record of securing philanthropic contributions by donors.

Costs will include facility utilities and maintenance as well as flexible animal care staffing. Specialized/certified equine therapy staff will be needed.

# Equine-Assisted Activities Research Lab

## Business Model Canvas

<h3>Key Partners</h3> <ul style="list-style-type: none"> <li>• Equine Assisted Activities programs in the region and state of North Carolina</li> <li>• Isothermal Community College (collaborations in hands-on education and training)</li> <li>• Foothills Equestrian and Nature Center (FENCE)</li> </ul>	<h3>Key Activities</h3> <ul style="list-style-type: none"> <li>• Therapy programs</li> <li>• Training and certifications of equine-assisted practitioners (Therapists, Equine Specialists, Educators)</li> <li>• Networking of equine assisted activity practitioners</li> <li>• Evidence-based research on equine assisted activities</li> </ul>	<h3>Value Proposition</h3> <p>For organizations requiring equine-assisted therapy for their clients and a valid assessment of its impacts on the patients, SECRC's Equine-assisted Research and Therapy lab offers therapy programs by certified staff and the assessment of outcomes by multi-disciplinary and experienced researchers.</p> <p>Unlike other equine-assisted therapy programs that lack the capacity to monitor the impacts of their programs, this lab offers paid therapy programs with an evaluation process and specialized researchers that monitor impact, which enables clients to document the impact on their clients to justify funding.</p>	<h3>Customer Relationships</h3> <ul style="list-style-type: none"> <li>• Prospective customer organizations are invited to visit the lab to learn about therapy methods and impact evaluation research methods</li> <li>• Customers of therapy services enroll for mid and long-term programs</li> </ul>	<h3>Customer Segments</h3> <ul style="list-style-type: none"> <li>• US Military veterans and wounded warrior programs</li> <li>• Schools systems</li> <li>• Youth at Risk and Adjudicated Youth organizations</li> <li>• Individual families with children or adults in need of therapy</li> <li>• Individuals who have experienced trauma or abuse</li> <li>• Equine-assisted activities/programs</li> </ul>
<h3>Key Resources</h3> <ul style="list-style-type: none"> <li>• In-house therapy herd</li> <li>• Staff: Psychotherapists, Equine Specialists, Therapeutic Riding Instructors, Barn Manager</li> </ul>	<h3>Key Resources</h3> <ul style="list-style-type: none"> <li>• In-house therapy herd</li> <li>• Staff: Psychotherapists, Equine Specialists, Therapeutic Riding Instructors, Barn Manager</li> </ul>	<h3>Channels</h3> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Active participation in academic forums</li> <li>• Organized network of equine-assisted programs in NC</li> </ul>	<h3>Channels</h3> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Active participation in academic forums</li> <li>• Organized network of equine-assisted programs in NC</li> </ul>	<h3>Channels</h3> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Active participation in academic forums</li> <li>• Organized network of equine-assisted programs in NC</li> </ul>
<h3>Costs</h3> <ul style="list-style-type: none"> <li>• Employee salaries (administrative staff, maintenance, therapist)</li> <li>• Veterinarian &amp; Farrier costs for therapy herd</li> <li>• Legal costs- Insurance costs</li> <li>• Utilities</li> <li>• Boarding of residential therapy herd</li> </ul>	<h3>Revenue and Benefits</h3> <ul style="list-style-type: none"> <li>• Fees from therapy programs</li> <li>• Fees from training programs (for practitioners)</li> <li>• Fees from research grants</li> </ul>	<h3>Revenue and Benefits</h3> <ul style="list-style-type: none"> <li>• Fees from therapy programs</li> <li>• Fees from training programs (for practitioners)</li> <li>• Fees from research grants</li> </ul>	<h3>Revenue and Benefits</h3> <ul style="list-style-type: none"> <li>• Fees from therapy programs</li> <li>• Fees from training programs (for practitioners)</li> <li>• Fees from research grants</li> </ul>	<h3>Revenue and Benefits</h3> <ul style="list-style-type: none"> <li>• Fees from therapy programs</li> <li>• Fees from training programs (for practitioners)</li> <li>• Fees from research grants</li> </ul>

## Equine-Based Agribusiness Lab

*A facility for research exploring solutions for leveraging the equine-based economy for local equitable and sustainable development, with office space and structural connections to a regional network of farmers, horse owners, venues and public institutions; earning revenue from fees to research grants, and services provided to local public institutions.*

This lab will facilitate multi-disciplinary research examining and enabling local supply chains of products and services for the equine-based economy. One of the most clear areas is the production and sale of forage for sport horses. In this context, this lab will seek soil and crop science solutions for the production of high-value forages, for the adoption of these crops by local farmers, for the consumer adoption of these local forages, and for their seamless retail to local markets (i.e., private horse owners and equine sports venues). The physical facilities needs are limited to office space, and access to the Village's Large group multi-function barn for workshops, networking events and meetings.

Research teams will pay fees for the lab's role in economic development and ag development grants. Neighboring Extension offices may pay fees to the lab for the organization of training workshops.

Costs will consist mostly of staffing.

# Equine. Economy.

# Equine-Based Agribusiness Lab

## Business Model Canvas

<b>Key Partners</b> <ul style="list-style-type: none"> <li>• NC State University (CALs, CoM, CNR)</li> <li>• Cooperative Extension</li> <li>• TIEC and other equine sports venues and organizations</li> <li>• Isothermal Community College (connections with key stakeholders)</li> </ul>	<b>Key Activities</b> <ul style="list-style-type: none"> <li>• Rental of lab space</li> <li>• Rental of experimental plots</li> <li>• Liaison with local growers, agricultural support organizations, equine supplies retailers, and consumer groups</li> </ul>	<b>Value Proposition</b> <p>For multidisciplinary research teams exploring solutions for leveraging the equine-based economy for equitable and sustainable development, who struggle with limited access to actors across the spectrum of the equine-based agribusiness supply-chain, SECRC's Equine-based Agribusiness Lab offers access to growers, support organizations, retailers and consumers willing to participate in research projects.</p> <p>Unlike traditional agribusiness research initiatives, the Lab is structured as a gateway to the complex equine agribusiness supply-chain in the region, which affords the opportunity to conduct multi-disciplinary research that integrates production, distribution and consumer behavior components.</p>	<b>Customer Relationships</b> <ul style="list-style-type: none"> <li>• Researchers are tenants of the facilities for the duration of the contracts</li> <li>• Researchers pay to use experimental plots</li> <li>• Lab will nurture relationships with growers and consumer groups through networking events and communications</li> </ul>	<b>Customer Segments</b> <ul style="list-style-type: none"> <li>• Research teams from universities in the Southeastern US</li> <li>• Corporate research teams</li> <li>• Forage growers and their support organizations</li> <li>• Horse owners and equine sports venues</li> </ul>
<b>Key Resources</b> <ul style="list-style-type: none"> <li>• Lab space</li> <li>• Lab equipment</li> <li>• Experimental plots</li> <li>• Relationship with a regional network of growers</li> <li>• Staff: administrative, maintenance</li> </ul>	<b>Channels</b> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Acknowledgement in research publications and presentations involving the lab</li> <li>• Direct relationships and contracts with ag product industry and with consumer groups</li> </ul>	<b>Revenue and Benefits</b> <ul style="list-style-type: none"> <li>• Fees from rental of space lab for research</li> <li>• Fees from rental of experimental plots</li> <li>• Fees for use of facility for Extension and education programs</li> </ul>	<b>Costs</b> <ul style="list-style-type: none"> <li>• Employee salaries (administrative staff, maintenance)</li> <li>• Legal</li> <li>• Utilities</li> <li>• Events and communications</li> </ul>	



## The Village

In support of the proposed research hub, the “Village” will incorporate shared facilities, outdoor spaces, and lodging for postdocs, students, faculty, research staff, athletes and visitors; horse boarding barns; a food services marketplace for guests of the village, and multi-functional community hall for large events including conferences and workshops. The village will serve as a place where researchers and visitors can relax and connect with each other. It will also provide stalls designed to host primarily research and therapy horses and herds.

### Researcher, Athlete and Visitor Lodging

*Self-catered lodging operation with multiple short and long-term rental units designed to host researchers, students, equestrian athletes, and tourists; providing convenient access to the center’s facilities and to neighboring venues and communities; earning revenue from rentals.*

The Center will have a cluster of 10 homes lodging between 6 and 10 people, each with two rooms, a living area and a self-catering kitchen. The homes should have a space appropriate for work/office/reading. The cottages should be designed to accommodate long-term tenants (e.g., a researcher during a semester fieldwork) as well as short-term visitors (e.g., team of athletes staying during weekend event). The cottages will be geographically clustered around a common area that has an open group kitchen so that groups staying in various cottages can make and enjoy group meals and meetings. The cottages should have easy access to the public entrance and the research facilities.

The target markets for the Village will be collegiate equine sports teams during their October to March season; equine sports teams competing during the regular April to October season; research teams working in studies in the facility and in the region; other researchers spending extended periods of time conducting research in the facility or region; and groups of visitors participating in conferences and meetings in the facility.

Food catering for the village will be provided by local pre-approved companies on demand - i.e. when cottages are rented the guests can solicit the provision of a variety of food services ranging from provision of breakfast/lunch boxes, locating a breakfast cart in the facility, organize a food truck rodeo for dinner, providing a box of produce for a week, etc.

Costs of this unit will include maintenance, utilities and cleaning. There will be need for a reservations staff, and someone to do check-ins and check-outs - new mobile check-in models should be used.



# Research, Athlete and Visitor Lodging Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• Local cleaning services companies</li> <li>• FENCE</li> <li>• TIEC</li> <li>• Local food services providers</li> <li>• Isothermal Community College (hospitality training programs)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Accomodation</li> <li>• Food services</li> </ul>	<p><b>Value Proposition</b></p> <p>For high-school and collegiate equestrian teams, who struggle to find team-friendly accommodation close to horse boarding establishments, lodging at SECRC is has the capacity to house all members of a large team as well as board the horses in the same site.</p> <p>Unlike regular hotels and inns' double units which cause teams to separate, SECRC offers a mix of contiguous private and bunk bed rooms in the same facility, respectively for coaches and athletes, eliminating the hassle and inconvenience of overnighiting in regular hotels among other guests, often miles apart from the team's horses, which leads both to a reduction in stress and increased supervision over staff, athletes and horses.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Customers are guests of the center</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Resident researchers</li> <li>• Visiting researchers</li> <li>• Equestrian teams</li> <li>• Participants in conferences and workshops</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Proximity to research facilities</li> <li>• Proximity to stables</li> <li>• Large Rooms with Bunk Beds</li> </ul>	<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Proximity to research facilities</li> <li>• Proximity to stables</li> <li>• Large Rooms with Bunk Beds</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Online marketing through the center's website</li> <li>• Lodging metasearch websites</li> <li>• Direct marketing on-site</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Online marketing through the center's website</li> <li>• Lodging metasearch websites</li> <li>• Direct marketing on-site</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Online marketing through the center's website</li> <li>• Lodging metasearch websites</li> <li>• Direct marketing on-site</li> </ul>
<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Employee salaries</li> <li>• Utilities</li> <li>• Outsourced cleaning services</li> <li>• Linen and furniture updates</li> <li>• Food services</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Daily charges by unit/person</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Daily charges by unit/person</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Daily charges by unit/person</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Daily charges by unit/person</li> </ul>

## Horse Boarding Barns

*Horse boarding operation with 100 stalls designed to host research and therapy herds as well as visiting athlete horses; earning revenue from fees to grants and therapy programs.*

The Center will have 100 stalls to accommodate a permanent research herd, a therapy herd and temporary stays. The facility will need a barn for the storage of materials and equipment. Short term boarding will be mainly for horses participating in competitions nearby, as well as for horses being evacuated from extreme weather events. The facility will be structured in semi-independent sections to accommodate regulations and best practices for the biosecurity of the various herds. In addition, the facility will be designed considering sustainability and horse wellbeing best practices to ensure the welfare of horses and the local environment.

Costs of this unit will include maintenance, utilities and cleaning. There will be need for a reservations staff, and someone to do check-ins and check-outs - new mobile check-in models should be used.

# Research. Therapy.

# Horse Boarding Barns

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• TIEC (overflow)</li> <li>• FENCE (overflow)</li> <li>• Isothermal Community College (grooming and ferrier internships)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Horse Boarding</li> </ul>	<p><b>Value Proposition</b></p> <p>For equestrian teams and private horse owners in transit through the region, who struggle to find horse boarding establishments close to their lodging, the SECRC Horse Boarding Barns provide convenient boarding for horses and lodging for their humans in the same site.</p> <p>Unlike regular horse boarding facilities which cause horses and owners/athletes to separate, SECRC offers flexible stables rentals for single and multiple horses near lodging facilities, which enables owners/athletes/teams to remain close to their horses.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Forums</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Research teams</li> <li>• Equestrian teams</li> </ul>
<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Employee salaries</li> <li>• Feed, Wood Chips</li> <li>• Utilities</li> <li>• Maintenance</li> <li>• Manure Disposal</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Boarding fees</li> </ul>				

## Food Services Marketplace

*Online marketplace for local catering companies to list their food services to guests of The Village; with designated indoor and outdoor areas for the provision of food services; earning limited income from membership fees of vetted catering companies.*

Institutional food operations are often costly and they often fail to meet customers' ever-evolving preferences. In addition, such institutional food services often fail to source locally and therefore they yield limited trickle down economic benefits to local farmers and micro-businesses. Accordingly the Center will provide food services to staff, residents and visitors through a coordinated outsourcing with local food businesses. The center will use a web-based application for local food businesses to offer their services and for consumers and the Center to book and rate them. Namely, guests of the Village will be able to specify whether they are interested in local farm produce boxes for their self-catering stay, and whether they would like to buy catered meals or food trucks/carts. Likewise, organizers of events in the Center will be able to shop for catering services provided by local companies.

This model will increase the local socio-economic impact of the Center on the local farms and small businesses and will reduce the costs and risk of operating the Center. Cost will consist on the development and integration of the online marketplace in the information and reservation systems supporting the Center; as well as the maintenance of the Center's cooking facilities. Revenues will consist of a small registration fee by interested local food companies, as well as a small percentage of sales.

# Food. Marketplace.

# Food Services Marketplace

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• Chambers of commerce; Isothermal Community College SBDC (mentor small food companies)</li> <li>• Extension (mentor farmers to provide produce boxes)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Mediate booking of food services</li> <li>• Collect and manage customer reviews of food service companies</li> </ul>	<p><b>Value Proposition</b></p> <p>For local restaurants and catering companies, food trucks and farmers which struggle to focus their commercial efforts in activities with predictable revenue, the SECRC Food Services Marketplace provides an opportunity to make their products and services available to consumers on a by-reservation basis.</p> <p>Unlike other opportunities in which food services companies participate in events with the uncertainty of sales, SECRC customers book food services from their preferred companies ahead of time, which give these companies the assurance of revenue.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Networking with food services companies to clarify expectations</li> <li>• Monitor reviews to ensure service quality</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Restaurants</li> <li>• Catering companies</li> <li>• Food trucks</li> <li>• Farmers</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Village's self-catering kitchen</li> <li>• Convenient food truck and food cart parking locations</li> <li>• Web application integrated with Center's information and reservations system</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing - food services booking integrated into the Center's lodging and events reservation system</li> </ul>	<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Maintenance of web-based application</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Registration fees from interested food services companies and farmers</li> <li>• Small percentage of sales</li> </ul>	

## Large Group Multi-Function Community Hall

*A multi-purpose facility, serving as venue for special events, conferences and workshops; with easy access to lab facilities and to equine sports venues; earning income from rental of space.*

This unit will consist of a facility available to rent for special events, conferences and workshops. The facility will be designed facing the pastures and enclosures so as to make patrons feel embedded in the equine center. Events may include observations and hands-on activities in the various labs of the Research Hub, therefore the venue will be located within convenient access to the labs. Food services to the facility will be provided by local approved catering companies, therefore the venue will have a convenient entry and food prep facility for these companies. The organization of the venue space will be flexible allowing for large group format and small-group working rooms.

These facilities will be available to rent for a fee. A list of local pre-approved event planning companies and catering companies will be allowed to operate in the facility.

# Sharing. Community.

# Large Group Multi-Function Community Hall

## Business Model Canvas

<b>Key Partners</b> <ul style="list-style-type: none"> <li>• TIEC</li> <li>• Fence</li> <li>• Isothermal Community College (vet local event and training companies)</li> </ul>	<b>Key Activities</b> <ul style="list-style-type: none"> <li>• Rental of conference space</li> </ul>	<b>Value Proposition</b> <p>For research, Extension, community and equine sport organizations struggling to find venues for equine-related events, the Large Group Multi-function Hall is a venue suitable for conferences and workshops that is integrated in SECRC's equine complex and offers convenient access to labs, pastures, and the museum.</p> <p>Unlike other event spaces in hotels and institutional venues located in urban areas, SECRC's venue is integrated in the equine research and education campus, which allows customers to engage event participants in experiential components.</p>	<b>Customer Relationships</b> <ul style="list-style-type: none"> <li>• Customers rent the facilities and hire additional support services from local companies (e.g., catering)</li> <li>• Socialization of the facility among select local and regional institutions</li> </ul>	<b>Customer Segments</b> <ul style="list-style-type: none"> <li>• Research, Extension, community and equine sport organizations</li> <li>• Event planners</li> </ul>
<b>Key Resources</b> <ul style="list-style-type: none"> <li>• Facilities</li> <li>• Curated access to other areas of the Center</li> </ul>			<b>Channels</b> <ul style="list-style-type: none"> <li>• Direct marketing</li> </ul>	
<b>Costs</b> <ul style="list-style-type: none"> <li>• Utilities</li> <li>• Facility upgrades</li> </ul>		<b>Revenue and Benefits</b> <ul style="list-style-type: none"> <li>• Fees from rental of space</li> </ul>		



## Local Business Hive

In support of the main mission of this Center the local business “hive” aims to provide dynamic opportunities that will optimize the cultural and entrepreneurial activities enabling grassroots equine-based economic development in the local communities. This area will be designed as the front door to the region and will include community oriented multi-purpose facilities and outdoor spaces, such as a visitor center, local farmers and artisans market, business incubator, and equine history and science museum.

### Visitor and Community Concierge

*A facility welcoming and assisting visitors to the center and to the region with general information, communication with local businesses, and navigation; funded by local government.*

The SECRC must serve as a welcoming point dispersing visitors to the rest of the region so as to avoid an enclave tourism development process that will cluster economic growth within the I-74 corridor and to TIEC. The Visitor & Community Concierge area of the Center will aim to advise visitors to the multitude of services, attractions and experiences available in the region and in this way, the Center will help disperse tourism revenue opportunities among the small companies and tourism coops in the region. Often new and long-time local residents are unaware of the interesting activities available in their regions, so this Concierge service will also help local communities experience the natural, agricultural, cultural and equine-related activities available.

The Visitor and Community Concierge will help raise overnight stays in the region; accordingly, this unit will be funded in partnership with regional Tourism Development Authorities which in turn are funded by occupancy tax. During high-flow periods, the Concierge area will also potentially include booths from local tourism business cooperatives/associations interested in the opportunity to reach out to visitors directly. Participating businesses and business coops and associations may be charged participation fees; which in turn may be subsidized through economic development grants.



# Visitor and Community Concierge

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• County governments (support collaboration)</li> <li>• NC State (monitoring fairness of voice and access)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Rental of space to tenants</li> <li>• Collaborative efforts to make the Concierge space representative of the regional equine destination and culture</li> </ul>	<p><b>Value Proposition</b></p> <p>For regional tourism development authorities, businesses and associations, which struggle to reach visitors with direct marketing efforts, SECRC's Visitor &amp; Community Concierge is a welcoming bottleneck of visitor traffic where visitors can be engaged in in-depth discussions about things to do in the region.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Networking events among regional tourism organizations and businesses</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Regional Tourism Development Authorities</li> <li>• Local tourism businesses and business associations</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Goodwill among regional tourism organizations and businesses</li> </ul>	<p>Unlike other visitors centers that provide information about limited areas and receive scant visits due to their narrow geographic scope, SECRC's Visitor and Community Concierge engages visitors with information about the entire regional equine destination and invites the participation of local businesses, which make it more effective at influencing visitor behaviour and spending.</p>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing</li> </ul>		
<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Maintenance and utilities</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Rental of space paid by local tourism organizations and businesses (fees might be subsidized by grants)</li> </ul>			

## Local Farmers and Artisans Market

*A marketplace where local farmers and artisans can easily offer their products to visitors of the center and the region; earning revenue from small fees paid by participating businesses.*

As a welcoming point receiving and introducing visitors to the broader equine region, the SECRC will have an area in which farmers and artisans be accessible to the high flow of visitors. The market will have small customer-contact units and also larger areas selling through cooperative agreements or as consignment.

Individual and groups of farmers and artisans will pay rent of space to showcase and sell their food products and crafts to visitors. This component of the Center will generate revenue for utilities and maintenance; and it will partially fund programming coordinator that will engage with community groups and hospitality industry in the region to encourage the flow of visitors and community members through the center.

# Farmers. Artisans.

# Local Farmers and Artisan Market

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• Extension offices</li> <li>• Local agriculture organizations</li> <li>• Local arts organizations</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Rental of retail space</li> <li>• Communications and other forms of collaborative engagement with tourism industry and community organizations to generate flow of visitors and residents</li> </ul>	<p><b>Value Proposition</b></p> <p>For farmers and artisans, which struggle to find direct retail space in equine venues or have a difficult time drawing customers to their homes or small retail units spread out through the region, the SECRC market is a high-flow point of visitors and residents that offers a affordable and flexible retail space for rent.</p> <p>Unlike retail units for rent in neighboring equine sports venues that are priced to target high-end brands and large outside retail companies, and unlike small farms and art studios that are scattered, the SECRC Local Farmers and Artisans Market will be affordable to tenants and convenient to visitors, which will enable micro-ventures in the region to afford reaching visitors and residents with effective direct marketing efforts.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Networking opportunities for farmers and artisan tennants</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Individual farmers and artisans</li> <li>• Groups, associations and coops of farmers and artisans</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Flexible, modular retail space</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Rental fees</li> </ul>		
<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Staff salaries</li> <li>• Utilities and maintenance</li> </ul>				

## Regional Business Incubator

*A collaborative work environment with shared meeting space and business services, front stage access to visitors, and structured networking and capitalization opportunities; engaging local startups involved in the equine-based economy; earning revenue from office space rental to startups, from economic development grants, and private/public business development partnerships.*

In accordance with NC State's commitment to translate scholarship into economic innovation, and indeed in accordance with best practices of impactful universities, the SECRC will include a startup incubator with the goal to fuel the incubation and development of companies that leverage the scholarship being developed in the center, and the burgeoning equine-based economy in the region. The business incubator will consist of a collaborative working space for local startups broadly related to the regional equine-based economy. The physical space will be designed following the emerging best practices in this type of initiative with small modular office spaces for rent and large common shared spaces for collaborative work, social events, and to conduct meetings.

The incubator will be supported by membership fees of various levels to meet the needs and capabilities of startups at progressive levels of development, size, and capital. The incubator can also find support through grants, the support of institutions like Isothermal Community College's Small Business Development Center, financial sector private sponsors from Charlotte, and the facilitation of investment capital.

# Collaborative.

# Regional Business Incubator

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• NC State University</li> <li>• Isothermal Community College (nurturing of local innovators)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Organize networking events for startups, customers, investors and companies</li> <li>• Facilitate support services to the startups by local partners</li> </ul>	<p><b>Value Proposition</b></p> <p>For local equine startups, which struggle to find affordable space that enables networking and access to investors and customers, SECRC's Regional Business Incubator is a collaborative work space that offers modular offices and shared facilities and resources at a range of prices, which enables small companies to access work space appropriate to their developing stages.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Networking events</li> <li>• Business pitch competitions and networking events</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Startup companies</li> <li>• Business development organizations</li> <li>• Investment groups</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Modular office space and collaborative working space</li> <li>• Relationships with business development partners</li> <li>• Relationships with investment groups</li> </ul>	<p>Unlike other office spaces in which each tenant must cover all their business functions, SECRC's Regional Business Incubator dilutes the cost of meeting space and business functions among all its tenants and passes those savings to the tenants, with the added advantage of fostering networking, cross-pollination of business innovation and supply-chain collaboration, which leads to increased entrepreneurial success.</p>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing</li> </ul>		
<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Utilities and maintenance</li> <li>• Organization of periodic events and catering</li> <li>• Staffing (external and internal communications; programming)</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Membership fees paid by tenants</li> </ul>			

## Equine History and Science Museum

*An engaging museum with exhibits about the local equine history as well as exhibits educating patrons about discoveries and innovations developed by NC State and other participating institutions; targeting the local population as well as tourists and serving as a learning lab for interpretation and science communication academic teams; earning revenue from industry sponsorships, private philanthropic donations, heritage conservation grants, space rental for events, and visitor fees.*

The SECRC will have a sciences museum where the public will be able to experience first hand the innovations pursued by NC State researchers and other research teams involved with the various labs in the Research Hub. Additionally, the museum will include permanent exhibits on the equine history of the area in partnership with key equine sports partners and with other grassroots equine culture organizations.

The facility will be designed so as to enable the hosting of events, which will help fund its operations. Additionally, the museum can be supported through corporate sponsorships, philanthropy, and small visitor fees. The museum may highlight the role and achievements of key organizations that have fueled the region's rich equine heritage, and those exhibits may be funded by those organizations. The museum is also envisioned as a STEM learning lab in which teams in the Research Hub can interact with the public (i.e. community residents, school groups, equine tourists) to educate them about the scientific advances they have pursued - these efforts may be included in research grants and will help fund the museum operations.

# Culture.

# Learning Lab.

# Equine History and Science Museum

## Business Model Canvas

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• NC State University (development of exhibits)</li> <li>• Isothermal Community College (liaison with community organizations to develop equine heritage exhibits)</li> <li>• Equine sports organizations (contribute with exhibits)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Work with partners to create and host equine science and heritage exhibits</li> <li>• Facilitate networking and collaborations among stakeholders</li> </ul>	<p><b>Value Proposition</b></p> <p>For equine sports enthusiasts visiting the region and interested in engaging activities in addition to spectating events, which struggle with finding things to do, SECRC's Equine History and Science Museum is an attraction that offers fun and engaging opportunities to learn about equine sciences innovations and the rich equine heritage of the region.</p> <p>Unlike other attractions showcasing the history of isolated communities or equine organizations, SECRC's Equine History and Science Museum offers state-of-the-art engaging exhibits that involves its visitors in experiences in fun and educational ways, which leads to more satisfying visitor experiences.</p>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Mobile exhibits to surrounding communities</li> <li>• Newsletter to "friends of the museum"</li> <li>• Invitation events for donors</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• Residents and tourists visiting region</li> <li>• School groups and homeschooling groups</li> <li>• Equine sports events organizations</li> <li>• Research teams</li> <li>• Equine heritage groups</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>• Museum space</li> <li>• Relationships with research and equine sports partners</li> </ul>	<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>• Direct marketing</li> <li>• Event partnerships</li> <li>• Targeted advertising</li> <li>• Packaging deals with tourism and equine events partners</li> </ul>	<p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Staffing salaries (curator, support and visitor services staff)</li> <li>• Utilities and maintenance</li> <li>• Updating exhibits</li> </ul>	<p><b>Revenue and Benefits</b></p> <ul style="list-style-type: none"> <li>• Visitor fees</li> <li>• Industry sponsorships</li> <li>• Private philanthropic donations</li> <li>• Heritage conservation grants</li> <li>• Space rental for events</li> </ul>	

# Synergies Between SECRC Units

In order to grasp the real potential of SECRC as a driver of economic revitalization to the area, it is crucial to not only to have a clear understanding of the individual business models of each one of its thirteen independent units, but also the synergies between them. The conceptual model emerging from our interactions with stakeholders, and later operationalized in the design of this facility, gives life to the center, in the way there are symbiotic relationships between its units that not only contribute to Center's vibrancy but are also instrumental to the sustainability and economic viability of the project.

Accordingly, Figure 5 illustrates that each unit has ties with several other units, which reflects the interdependent nature of the center.

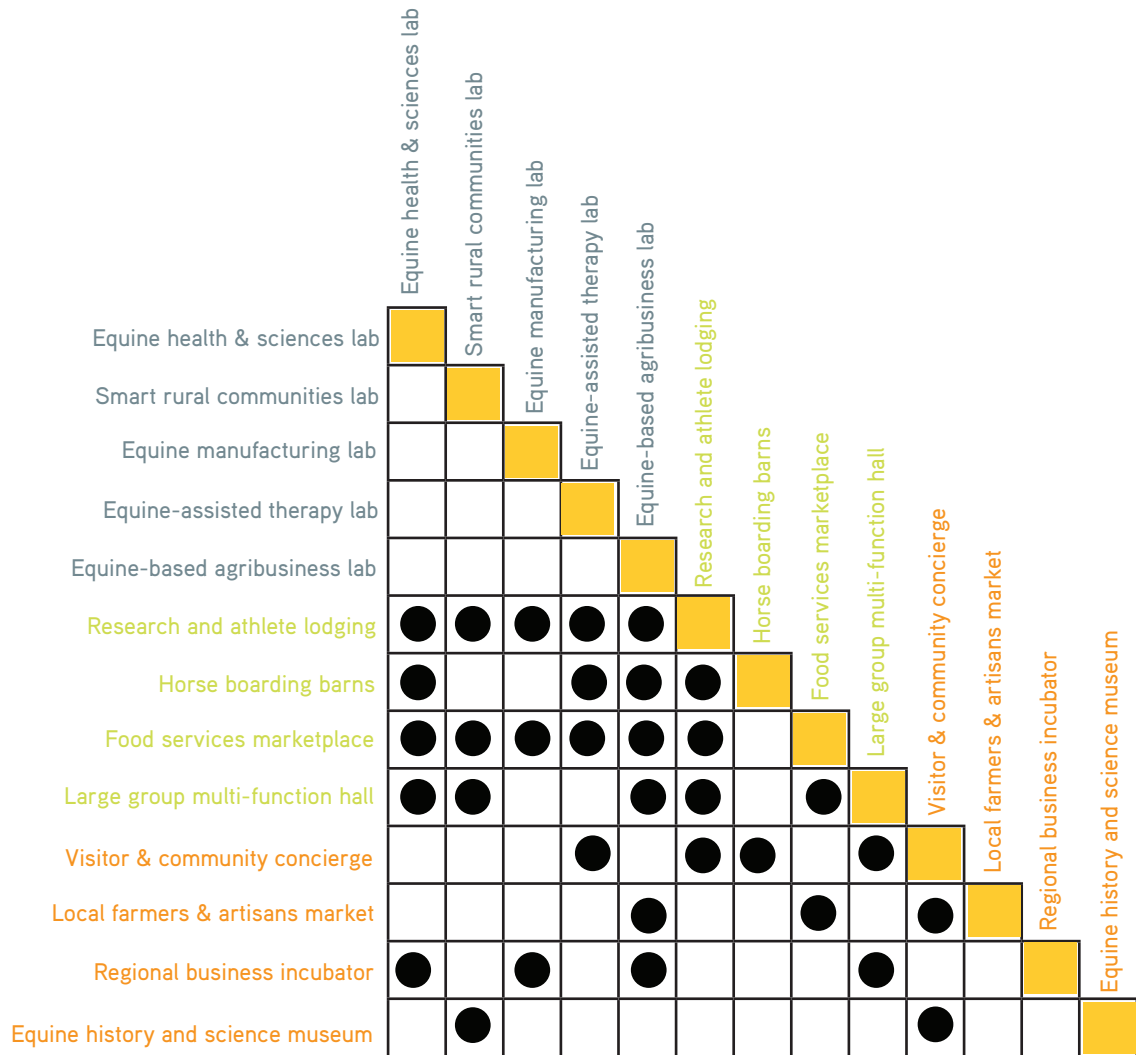


Figure 5. Relationships between units



- Equine health & sciences lab. Relies on the Village for researchers' food and accommodation, horse boarding, and conferences. The business incubator commercializes technology developed at the lab.
- Smart rural communities lab. Relies on the Village for researchers' food and accommodation and conferences. Sophisticated data-driven local management practices are displayed at the museum for visitors to visualize how the equine-based economic system impacts the region's society, ecology and economy.
- Equine manufacturing lab. Relies on the Village for researchers' food and accommodation. The business incubator commercializes solutions developed at the lab.
- Equine-assisted therapy lab. Relies on the Village for researchers' food and accommodation, as well as horse boarding. The visitor & community concierge will market and sell equine-assisted therapeutic solutions available to the general public.
- Equine-based agribusiness lab. Relies on the Village for researchers' food and accommodation, horse boarding, and conferences. The business incubator commercializes technology developed at the lab. The lab will collaborate with farmers at the Village's market in research projects aimed at optimizing the sector's supply chain.
- Research and athlete lodging. Provides accommodation to fellows and teams working in the Research Hub, as well as to owners of private horses boarded at the center. In terms of food, guests are welcome to use the food marketplace or the farmer's market. The visitor & community concierge will market and sell lodging products.
- Horse boarding barns. Provides boarding for the resident research herd as well as therapy horses. It enables teams and horse owners in transit to stay close to their horses.
- Food services marketplace. Provides food services to the research hub and the lodging unit. It has the potential to cater events at the multifunction hall. Some food items can be purchased through the farmer's market.
- Large group multifunction hall. It serves the research hub by being a privileged space for organizing conferences and workshops. Participants from other research centers can stay at the lodging unit. It can use the food services marketplace for catering services. The visitor center will have an important role in marketing the facility as an event venue. Finally, the incubator can use the space for business pitch competitions, shark tank events, or launching products and startups.
- Visitor & community concierge. It will actively promote the center and sell its many services, such as horse therapy, lodging, horse boarding, the multifunction hall, the artisans and farmers market, and the equine museum.
- Local farmers & artisans market. It will supply the food marketplace with ingredients grown locally, and the lodge with boxes of produce in the case of long rentals. It will collaborate with the agribusiness research lab for optimization of the supply chain.
- Regional business incubator. It is going to serve startups that develop and market products based on technologies developed at the research hub, and it will utilize the multifunction hall for its business events.
- Equine history and science museum. Receives people coming through the visitors' center. It will showcase advances in equine based-research achieved at the center.

Analysis of the independent business model of each of the 13 units of the center reveals a fairly balanced portfolio of business activities that range from higher control and lower risk to lower control and higher risk, which means that there are opportunities for different breeds of investors or the ability to provide balanced investment opportunities to single investors who wish to take on more than one product.



# Envisioning the Future SECRC Site

The Southeast Equine Community and Research Center (SECRC) is designed to integrate research, education, and community services in equine related activities and assisted therapies with hands-on experience. This center will create a cutting edge place where communities are served, students can learn, and multi-disciplinary scientists can conduct research on equine health and science, equine-assisted therapy, environmental health, equine manufacturing, agri-business, and smart rural development. This multi-faceted center through its facilities and landscapes will provide cutting edge research opportunities for multi-disciplinary teams in support of region's equine related needs. While supporting regional research endeavors, the Center will also provide spaces to support the Isothermal Community College's equine focused curricular and research activities.

## Conceptual Design Vision

Using the proposed framework, a conceptual master plan that addresses the design vision was developed. This framework and supporting master plan were formulated as a result of the feasibility study and the input received from the key stakeholders, such as the Isothermal Community College (ICC) and the equine community during the duration of the project. The philosophy behind the planning and design of the proposed Southeast Equine Community and Research Center (SECRC) is to create facilities and open spaces that reflect the needs of the equine focused educational and research activities, as well as to create spaces that engage the community. The proposed conceptual master plan and the design program solely reflect a vision that enables the collaboration between academia, private industry and local communities for the enhancement of the local equine-based economy and its contribution to equitable and sustainable regional development. This proposed conceptual plan reinforces the core component of the SECRC mission and its vision – education, research, culture, partnerships, health and wellness – by expressing them in overall site and building design concepts.

This vision together with the proposed conceptual facilities and outdoor spaces will provide a place guiding the future efforts to formalize partnerships among key stakeholders designated through this effort.

Hence, this document proposes a visionary framework, which resulted from a process that helped to identify the equine related needs in the region. These needs were then organized in a systematic way informing the development of a new equine-focused education and research center. Using design thinking process, as well as placemaking principles, the SEREP team developed a spatial program and a conceptual site design scenario that aim to support the future research and education activities in a premier equine education and research center complex that can become a focal place for various community based equine services in the region. The key planning and design principles guiding the future SECRC site include:

- Providing accessible, quality, cutting edge, flexible, and adaptive facilities and outdoor environment that will reflect SECRC's strong and innovative vision for evolving research, education and community based services.
- Prioritizing sustainability that will minimize pollution, energy and water use supporting sustainable land management for research, teaching, farming, natural areas, and other uses.
- Ensuring land, facilities, and activities work together to maximize knowledge transfer and positively impact local equine economy and sustainable development in the region.
- Developing and promoting healthy facility and environment that represent SECRC's health mission in support of well-being of researchers, faculty, students, visitors, staff, and horses.

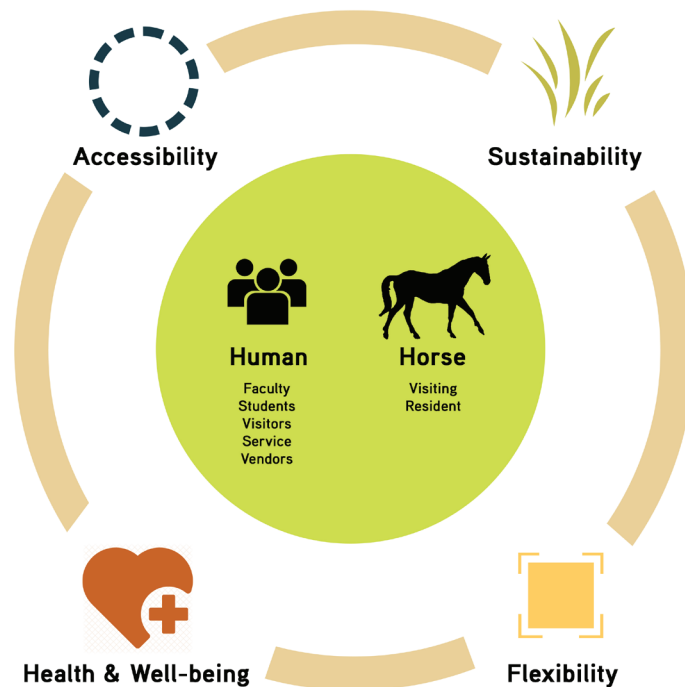


Figure 6. Proposed conceptual design framework for the SECRC site.

Creating a strong sense of place and image is essential to the development of the new equine education and research complex. This image must be responsive to the surrounding community utilizing the architectural characteristics of existing equine facilities and landscapes in the region. Movement of people, animals and vehicles in and around the facilities is equally as important and has been carefully planned to encourage safe and efficient flow and interaction among the future users such as students, visitors, researchers, staff, and horses.

An environmentally sensitive design approach has been taken throughout the design of this master plan. Water conservation and management techniques are considered including rainwater collection, retention ponds, raingardens, waste management and so on.

Facilities have also been designed and positioned on a conceptual site in distinct clusters/zones represented as Research Hub, Business Hive and the Village. However, the master plan thoughtfully connects these zones into one unified complex as a community and research center.

## Process and Stakeholder Input

The initial phases of this effort introduced the SEREP project team to the Foothills region understanding the assets, needs, and the opportunities within the equine community. Through the use of GIS based data and mapping strategies the environmental features unique to the area were identified. Site specific characteristics and requirements were also identified through case studies and an online survey conducted in the earlier phases. This phase helped us to identify and understand the key site characteristics and criteria that will help choose the future site and its location in the region. These criteria were also used to inform the “model” site used to present the proposed conceptual master plan, which will be explained in the next section.

Based on the feedback received from key stakeholders, as well as the consulting equine faculty at NC State University and Isothermal Community College the following principles of sustainable design were adopted as guiding objectives for the proposed vision plan:

- SECRC facilities will have size and scale that will be a good fit to the surrounding context.
- The design concept will be inspiring with cutting edge research and education facilities that will provide unique opportunities for key equine related research and educational activities.
- The site will incorporate well-defined and welcoming private and public open spaces within the facilities, as well as the outdoors.
- The overall site will be utilized as a living laboratory.

- The site will integrate sustainable design strategies that will be sensitive to the environment and help preserve water, as well as prevent environmental pollution through the use of sustainable land management practices.
- The site will provide safe and efficient flow and interaction among future users of the site.
- The design of the outdoors will provide access to a variety of nature experiences for all.
- The design will create a sense of place and image that reflects the character of the region, as well as the equine heritage of the area.
- The new SECRC site and its facilities will be designed and developed as a flexible, dynamic living plan.

The primary user groups anticipated for these facilities as part of the SECRC complex include:

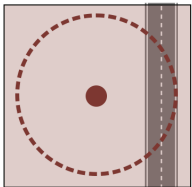
- Faculty, students and administrative personnel engaged in research and/or teaching for all equine based programs at ICC and other institutions from the southeast region (e.g. NC State University etc.). The primary research focus include but not limited to equine-assisted therapy, agri-business, smart rural development etc.;
- NC Cooperative Extension staff from Polk/Rutherford Counties and beyond.
- Researchers from corporates.
- Public agencies dedicated to sustainable and equitable development.
- Visitors/community members from the region and beyond.
- Horse owners/athletes etc.
- Business owners.



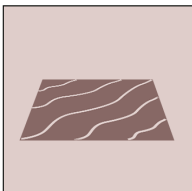
# Proposed Site Model and Its Features

Each project program requires site features that are important for the future project uses and activities to occur. These may include minimum parcel size, proximity to transportation routes and utilities, suitable soils, and many other parameters. Accordingly, the proposed framework and the conceptual master plan will require a site that will be located on a parcel of 100 acres at the minimum. The site will aim to provide a mixture of open pasture land with moderate slopes along with moderate tree coverage and brush vegetation that are unique to the region. Proper drainage strategies would be developed in order to provide rain water run-off management.

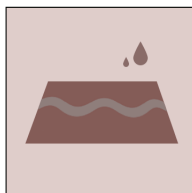
Although a thorough analysis of potential sites from Polk/Rutherford Counties was conducted in the earlier project phases, no specific site has been selected at this point. However, a model site has been developed in order to demonstrate how the proposed master plan for SECRC will be positioned on a future site that will include the following key site features and characteristics. The key site features are:



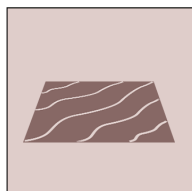
**Accessibility/Transportation** - The site is recommended to be within 30'-50' of an existing road with more than 1 linear mile away from highway/interstate. Accessibility is an important factor to future occupants and visitors of the SECRC complex.



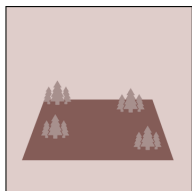
**Slope/Elevation** - The site should have less than 20% slope. Avoiding steep slopes can protect against erosion, provide safe pasture areas, and promote easy access. SECRC complex should have minimal slopes to allow for safe horse movement and limit erosion resulting from both horse traffic on pasture and the future development on site.



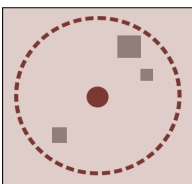
**Watershed/Floodplains** - The site is recommended not to be located within substantially large floodplain areas. The constructed area on the site should be 200ft away from surface waters and 200ft away from floodplain. This is essential in order to protect any substantial property damage during storms and preserve the water quality of streams, rivers and floodplains in the meantime. Therefore, the model site provides space outside of the floodplain where facilities are located. There is also adequate buffer area that separates surface waters from any potential pollution the center's activities might create (e.g. animal waste and eroded sediment).



**Soils** - The site that has prime farmland and well-drained soils are preferred in order to provide ideal pasture conditions for the proposed SECRC complex.



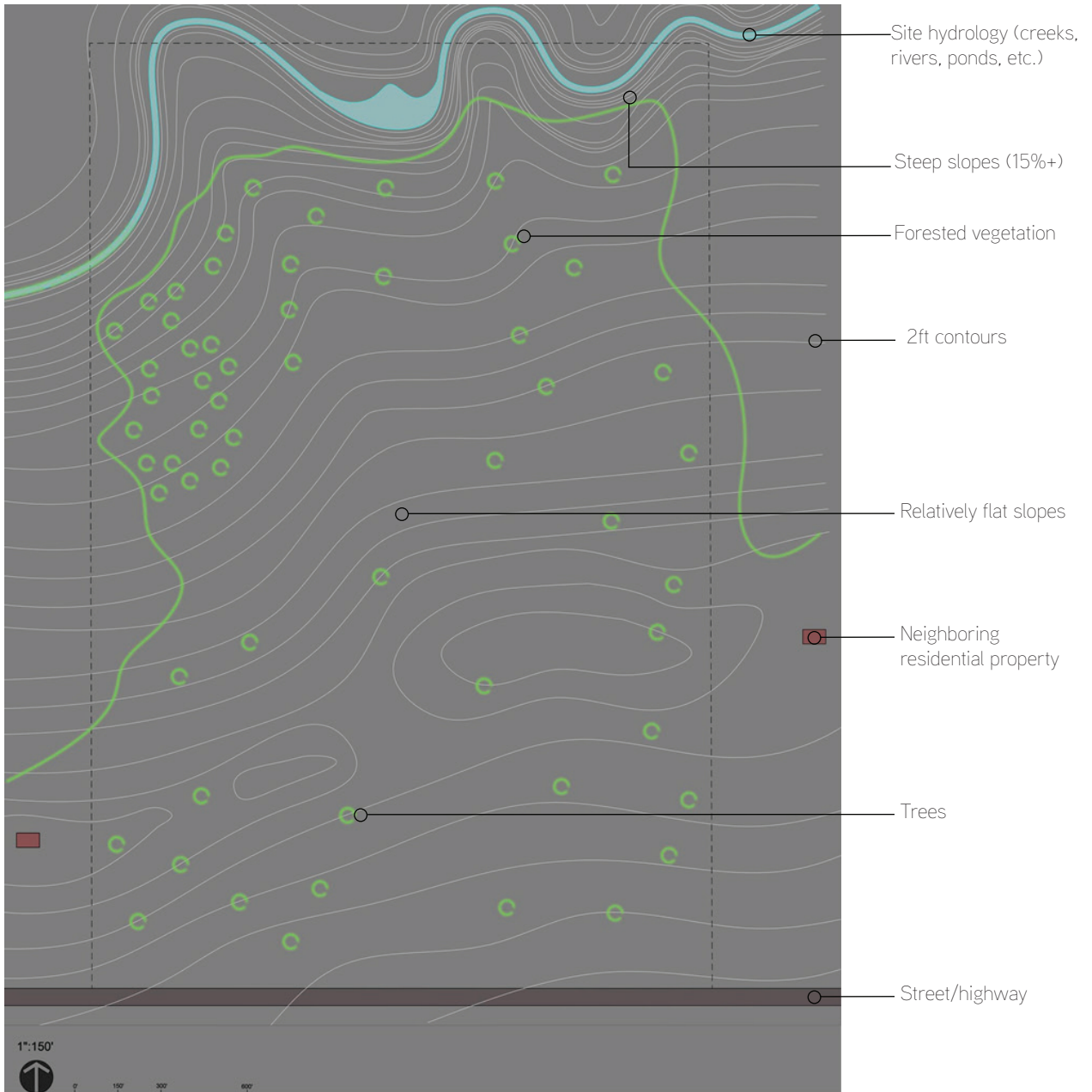
**Canopy/Tree Cover**- It is recommended that the SECRC site will have less than 50% as tree coverage. It is priority that the development of the center will protect against deforestation and damage to natural beauty of the area.



**Location and Proximity** - The future site for SECRC should be 200ft away from residential properties. It is also recommended that the site will be in close proximity to population centers, other equestrian and agricultural lands, programs, and activities available in the area.



The image below provides a diagram of the proposed model site and its conditions highlighting the major site/topography features, potential access to/from the site, relationships to any watershed, and the availability of tree coverage that simulate the ideal site conditions for the future SECRC property.



**Size:** 160 acres

**Ideal soils:** Prime farmland with well drained soils.

Figure 7. The “model” site and its features conceptualized for SECRC.

# Conceptual Master Plan

The proposed master plan implements the conceptual framework introduced earlier. It seeks to provide a functional, efficient, and meaningful conceptual design vision for the Southeast Equine Community and Research Center complex. The master plan was developed as a parallel effort to the programming process initiated in the project's earlier phases and it is based on facility requirements that were presented by the findings of this study. **However, it is important to note that these recommendations are conceptual and visionary aiming to provide some guidance for future conversations and efforts in the establishment of SECRC and its partnerships. The master plan is currently situated on a "model" site of 162 acres, which has been conceptualized for the purposes of this project.**

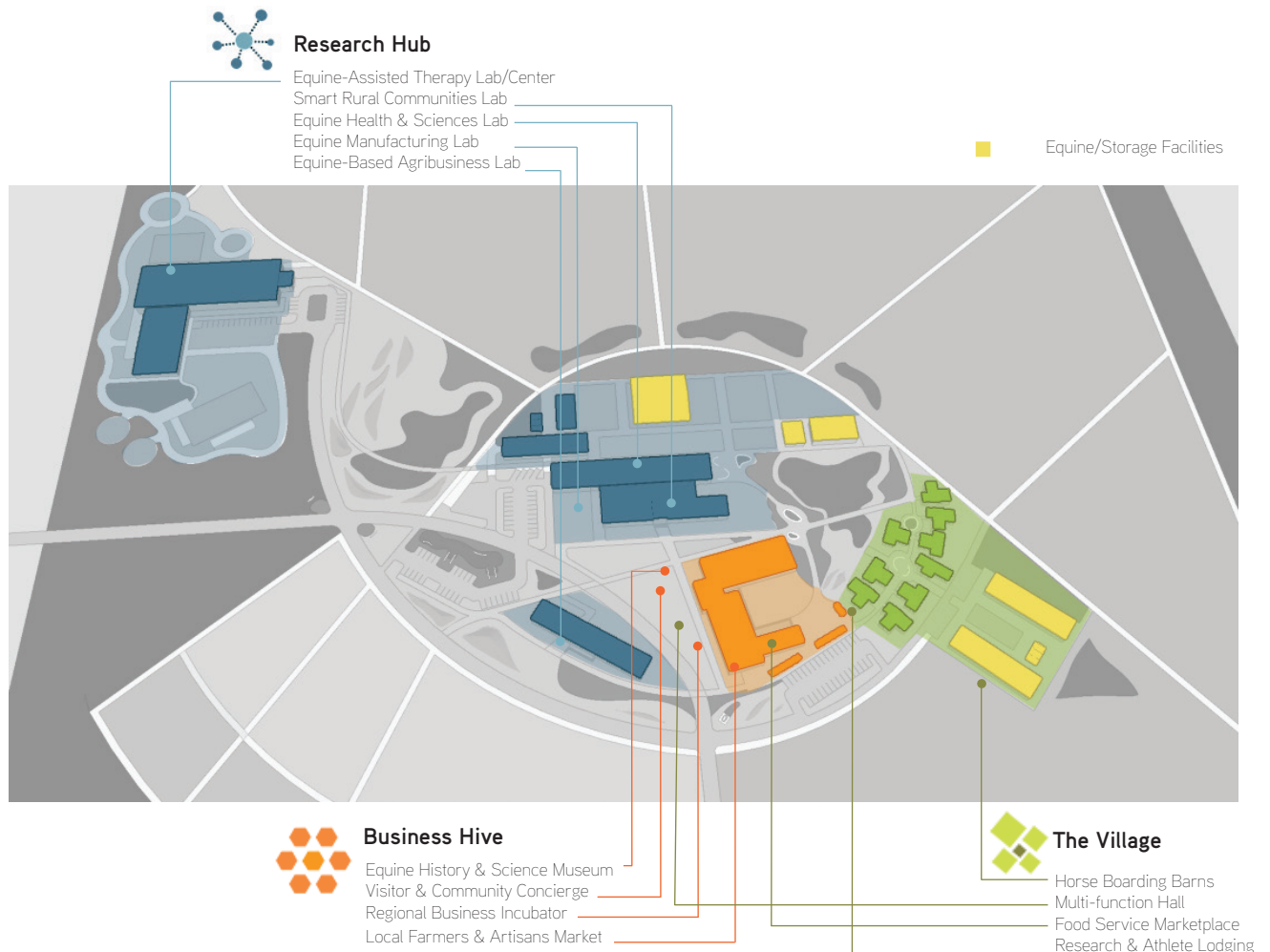


Figure 8. Proposed site program organized around a series of clusters connected by pathways and open spaces.



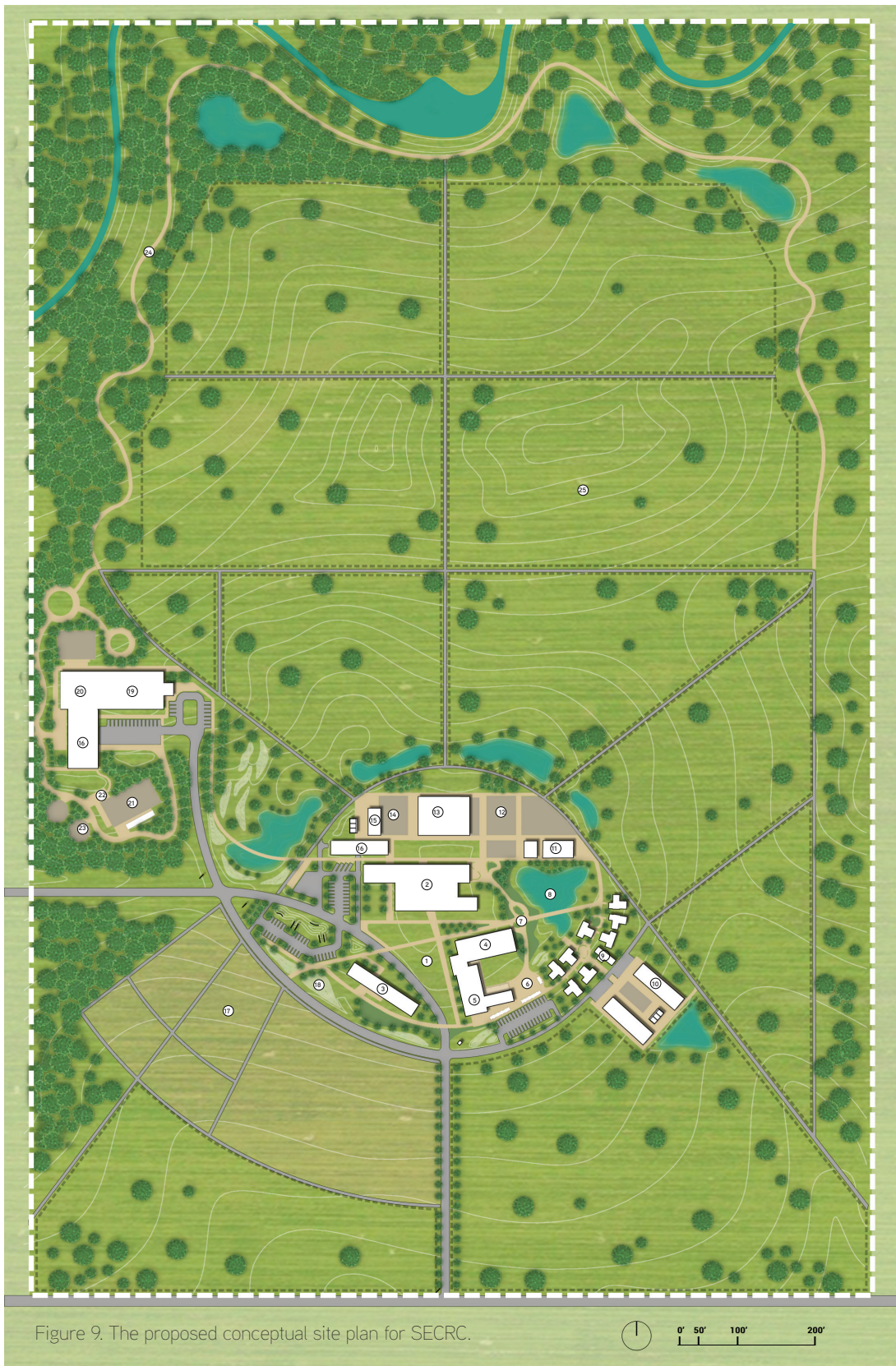


Figure 9. The proposed conceptual site plan for SECR.

- |                               |   |                               |
|-------------------------------|---|-------------------------------|
| 1. Entry Plaza/Axis           | 9. Cottage Buildings with Common Pantry House (Lodging) | 18. Mound Areas               |
| 2. The Core Research Facility | 10. Horse Boarding Barn                                 | 19. Therapeutic Lab/Center    |
| 3. Agribusiness Lab           | 11. Equine Storage Facilities                           | 20. Closed Arena              |
| 4. Equine History Museum      | 12. Horse Paddock                                       | 21. Open Arena                |
| 5. Business Incubator         | 13. Semi-enclosed Arena                                 | 22. Therapeutic Sensory Path  |
| 6. Market Place               | 14. Observation Arena                                   | 23. Therapeutic Round Paddock |
| 7. Thread and Gathering Area  | 15. Waste Management Research Lab                       | 24. Multi-purpose Path        |
| 8. Bio-retention Pond         | 16. Horse Barn/Stalls                                   | 25. Pasture                   |
|                               | 17. Field Testing Research Area (Hay Production)        |                               |

The master plan proposes a collaborative learning and research community that promotes innovative center model through learning and shared research facilities; outdoor spaces, as well as social and community spaces. However, it is highly recommended that the design of the proposed facilities will be reconsidered based on the future site and its existing conditions. The proposed concept of the overall layout of the new Southeast Equine Community and Research Center is comprised of a primary axis along which the primary entrance has been placed, leading up to the Business Hive area that includes a collaborative work space for entrepreneurs, welcome concierge, and an equine museum. The design of this collective incorporates the idea of a community-oriented space that embraces cultural and entrepreneurial activities in an equine-based economy. Both indoor and wrap around outdoor spaces are designed and planned spatially to create unique collaborative environments for both local residents, visitors, faculty, and students alike.

Terminating this axis beyond this Business Hive area are the Research Hub facilities. The research hub incorporates collaborative research team spaces, which accommodate variation of wet and dry labs, as well as meeting and classroom spaces. This area would allow for more privacy and security and would be limited to student, staff, and faculty/researchers. Supporting pasture area for these units wrap around to the North of these facilities. 48% (approximately 77 acres) of the model site is dedicated for pasture fields, 5% (8.3 acres) is considered as outdoor field testing lab area, and 4.2% (6.8 acres) is considered as hay production fields.

Located deeper within the site, on the left section of the site, is the Equine-Assisted Therapy Center /Lab including a building and its outdoor amenities. As an extension of the Research Hub area, the Therapy Lab/Center allows for more privacy and security enabling a perfect environment for therapeutic teaching and research activities. It is also accessible from the secondary road providing vehicular access to the site. Supporting therapeutic outdoor spaces and sensory paths wrap around the facility connecting to both multi-purpose paths and horse trails in proximity.

The village incorporating the housing units and the communal kitchen/community building for the visiting researchers and athletes is located to the right end of the site including a stable surrounded with open pastures.

Outside vehicular access will be provided from a main road to all necessary service areas, central shared parking, and facilities included on the site. All other on-site circulation for the SECRC is to be committed exclusively to horse lanes, small service transportation and pedestrian paths.

# Site Systems

## Stormwater Management

When it comes to agricultural landscapes that support horse farms and other equine-related operations, it is important to identify potential impacts these types of site programs have on the health of the landscape and the quality of local water systems. Establishing an effective stormwater plan will help reduce the impact horse farms have on water sources such as streams, rivers, groundwater etc. A proposed SECRC should introduce Best Management Practices (BMPs) wherever possible on the site in order to avoid contaminating clean runoff and reduce the amount of contamination produced from on-site agricultural operations by designing landscape systems that can capture runoff and treat it before it reaches nearby water systems.

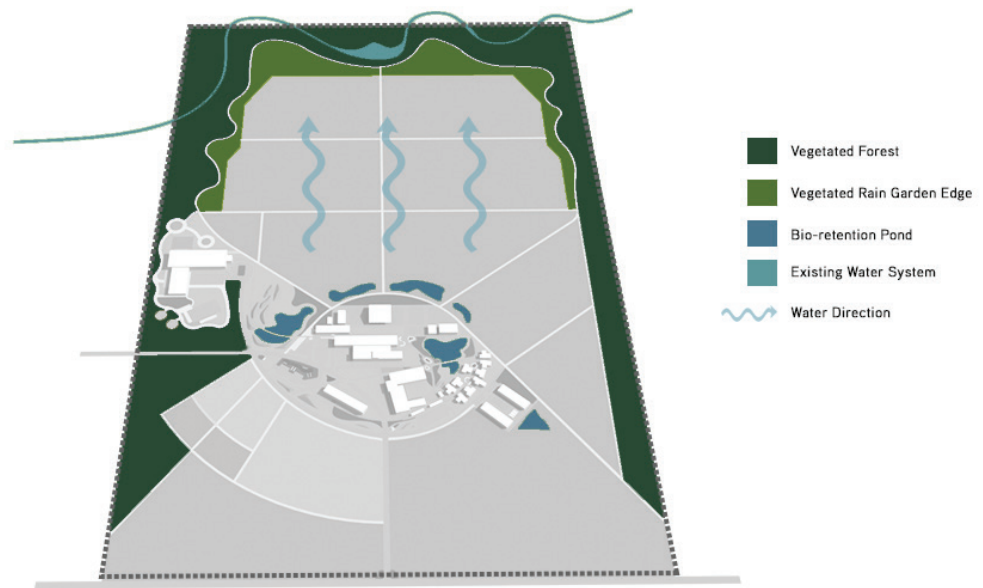


Figure 10. Proposed stormwater management system and site ecosystem on SECRC.



Water Harvesting

Pasture Irrigation

Stormwater Treatment  
from Horse Pastures

Stream Restoration

Figure 11. Best management practices for sustainable landscapes.



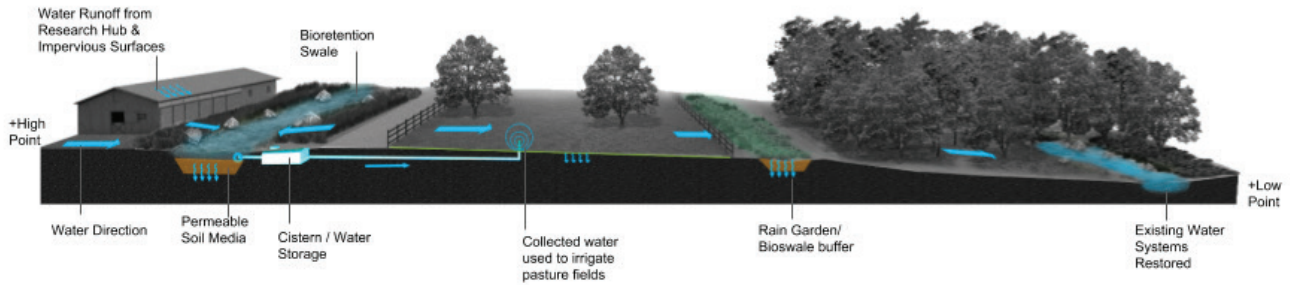


Figure 12. Proposed stormwater management system on SECRC site.

There are several components of an effective stormwater management system that can be implemented to not only improve the health and conditions of proposed and existing natural systems, but it can also benefit proposed equine-related programs economically. Outlined are some of the BMPs that can be established as part of the site planning and design process:

**Water Harvesting:** Agricultural and equine-related programs in the landscape will require a source of water for site irrigation, especially when it comes to hay production and pasture management. By collecting and harvesting rainwater, it will reduce the need and costs to obtain water from external water resources. Whether it is through above surface cisterns collecting water from building roof runoff or underground cisterns connected to designed water bodies, the water harvested can be utilized for site irrigation.

**Bioretention Basin:** This component of the landscape is defined as a shallow planted depression that is designed to provide treatment and filtration of surface water for a short period of time before it's discharged to nearby swales and local environments. Bioretention Basins can be engineered at various scales which will determine the volume of runoff it can store or be reduced. Vegetation in retention areas is utilized to reduce nutrient export through plant uptake, filtration, and absorption. This method can also be a component of a water harvesting system that collects and stores water.

**Biofiltration Swale/ Rain Garden:** Bioswales & rain gardens are designed as shallow channels of graded soils that contains vegetation that removes silt and pollutants from surface runoff water. They can be used along the sides of horse paddocks & pastures and serve as filter strips to filter out pollutants produced in equine programed areas. They can also be constructed in pastures and graded in a way to direct water into vegetated filtration areas.

Sources - Water Quality Management:  
 Rutgers, New Jersey Agricultural Experiment Station, Ryders Lane Farm: Equine Science Center,  
<https://esc.rutgers.edu/research/ryders-lane-farm/water-quality-management/>



# Waste Management

Properties that have horses on site will require an effective strategy for manure disposal to prevent health and environmental issues. Establishing composting methods as part of a manure management plan will provide sufficient amount of nutrients to the pasture fields and help with manure disposal on site. Development of a successful site manure management plan depends on the following components and practices:

- Placement of the composting area & manure storage pit.
- Proper manure disposal & composting methods.
- Preventing water pollutants from contaminating existing water systems on site & surrounding ecosystems.

The placement of the pit on the proposed model site should include ideal landscape conditions that includes a slight slope on site for proper rainwater runoff with buffer vegetation of native plants around it. Establishing a vegetation buffer around the storage pit and composting site will help clean and filter stormwater runoff from the waste source and prevent any potential waste pollutants from entering into existing water systems.

There are also research and educational opportunities that can explore and study manure as both a management practice and an energy resource on the site. Recent events in the scientific community and equine industry have been exploring horse manure as a renewable energy resource and be utilized for biofuel production. The proposed design and planning for SECRC includes a both a composting station, as well as a lab facility where faculty and students can conduct research and educational activities related to waste management education and biofuel research.

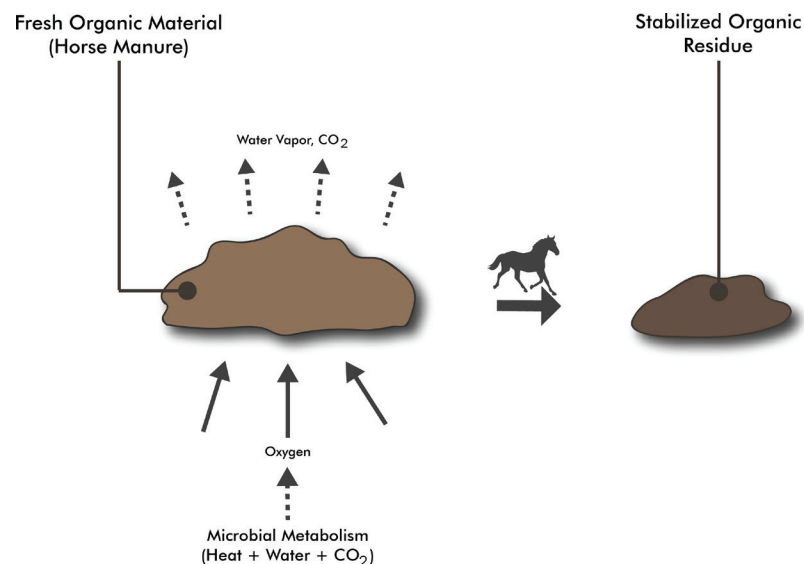


Figure 13. Best manure management practices.

Sources - Waste Management:

Rutgers, New Jersey Agricultural Experiment Station, Ryders Lane Farm: Equine Science Center

<https://esc.rutgers.edu/research/ryders-lane-farm/water-quality-management/>

# Pasture Management

Some of the proposed research programs will require resident horses on site in order to efficiently manage research-related activities that involve horses. A proposed SECRC with resident horses will require both a calculated amount of pasture land availability based on the number of horses on site and an effective management system in place that addresses both rotational grazing and forage management. According to the NC Cooperative Extension Service report, it is generally recommended that there should be 2 acres of pasture per mature 1,100-pound horse, which can produce 6 - 8 tons of forage annually to meet the feed requirements for the horse.

It is also known that horses have different behavioral patterns when it comes to grazing on the pasture fields. That is why it is important to establish an effective rotational grazing system to be able to maximize the use of each pasture. Through rotational grazing, horses are rotated from one pasture to another to maintain sufficient forage availability and reducing spot grazing. Pastures can be divided into a number of different sections as seen in the graphic below. The more divided the pasture can be, the less prone each pasture is to spot grazing. Each pasture should have access to shelter and a water source for horses.

In the proposed site design, there are a total of ten horse pastures that equate to 77 acres, which makes up roughly 48% of the total site. Each of these pastures are flexible when it comes to fence arrangement and grazing schedules. While each pasture should include shelter/shade and a water source, some pastures have water features, which horses can take advantage of to cool down.

Source: North Carolina Cooperative Extension Service

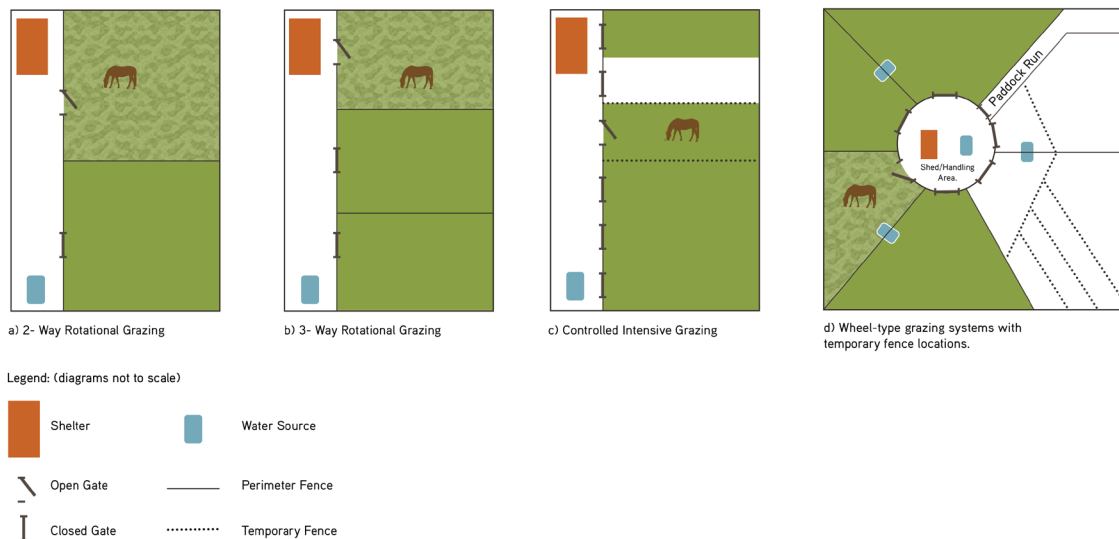


Figure 14. Best practices in rotational grazing.



Figure 15. Proposed pasture management practices on the SECRC site.

Sources - Pasture Management:  
 North Carolina Cooperative Extension Service  
<https://content.ces.ncsu.edu/managing-pastures-to-feed-your-horse>

## Circulation System

The proposed conceptual master plan recommends organizing the future SECRC around a series of clusters connected via vehicular paths, multi-purpose paths, horse trails, and localized tertiary pedestrian paths. The proposed circulation system aims to provide efficient and accessible paths that are safe for both people and horses, while providing connections to facilities and open spaces, as well as access to main entries of buildings on the site. Each distinct zone represented as Research Hub, Business Hive and the Village is connected via a hierarchy system of pathways supporting the use and activity flow between them.

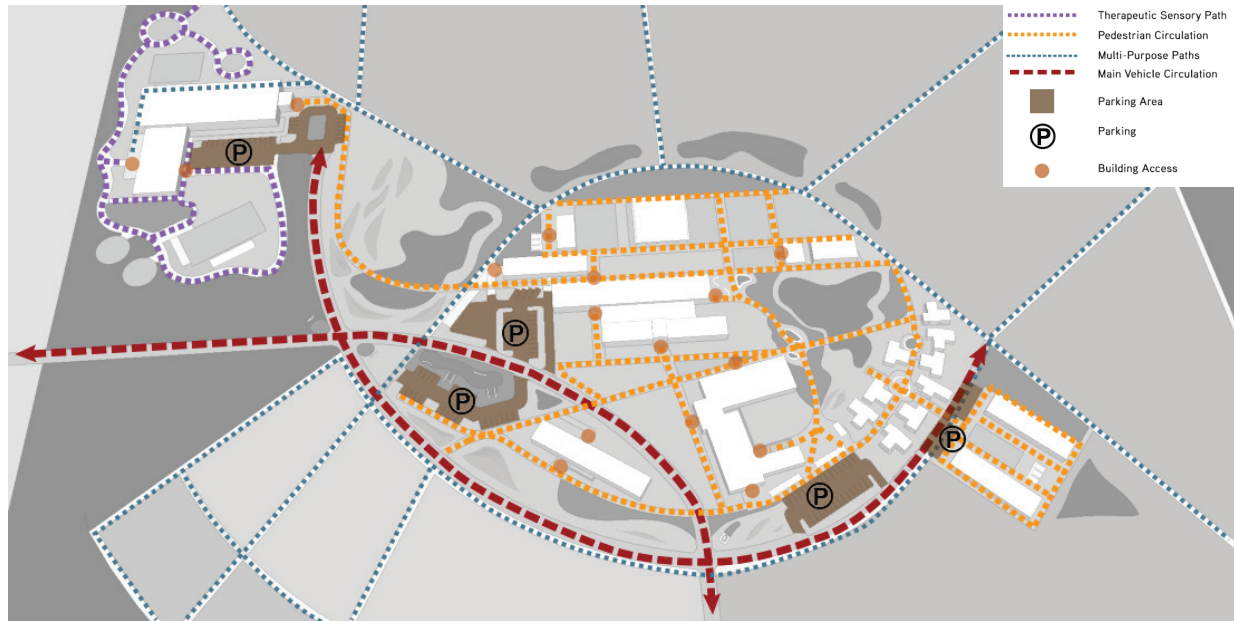


Figure 16. Proposed circulation system on the SECRC site.

**Main Vehicular Circulation:** Along the site there are two access points into the property for vehicular traffic. The first entry point located along the existing highway serves as a main entrance into the site. The second entry point on the west side of the property connects to existing minor roads and serves as a secondary entrance into the site. While driving along the driveway at the main entrance, visitors are taken through a pastoral landscape with rows of trees on each side of the driveway. Along the main driveway, visitors are directed towards views of the horse statue at the intersection and the main Research Hub facility. The main driveway provides parking options for both cars, trucks, and horse trailers adjacent to the main research facilities.

At the intersection, another driveway path is introduced, which serves as an inner driveway between major facilities on the site. The east wing of the inner driveway takes drivers to both the Village and the Business Hive facilities. This section of the driveway includes parking for cars at the Business Hive and horse trailer parking at the horse stable facilities within the Village. Continuing the inner driveway heading towards the Equine-Assisted Therapy Lab/Center, drivers are introduced to both the hay production/experiment fields on the left, and the Agribusiness Lab/Center on the right that includes parking for vehicles. The inner driveway then ends at the Equine-Assisted Therapy Lab/Center, which provides both parking and loading for cars, trucks, and horse trailers.

**Multi-Purpose Paths:** These paths include horse paths, as well as vehicular access for cars, trucks, and tractors. Most of the horse pastures/ experiment fields are also accessible from the defined multipurpose paths.

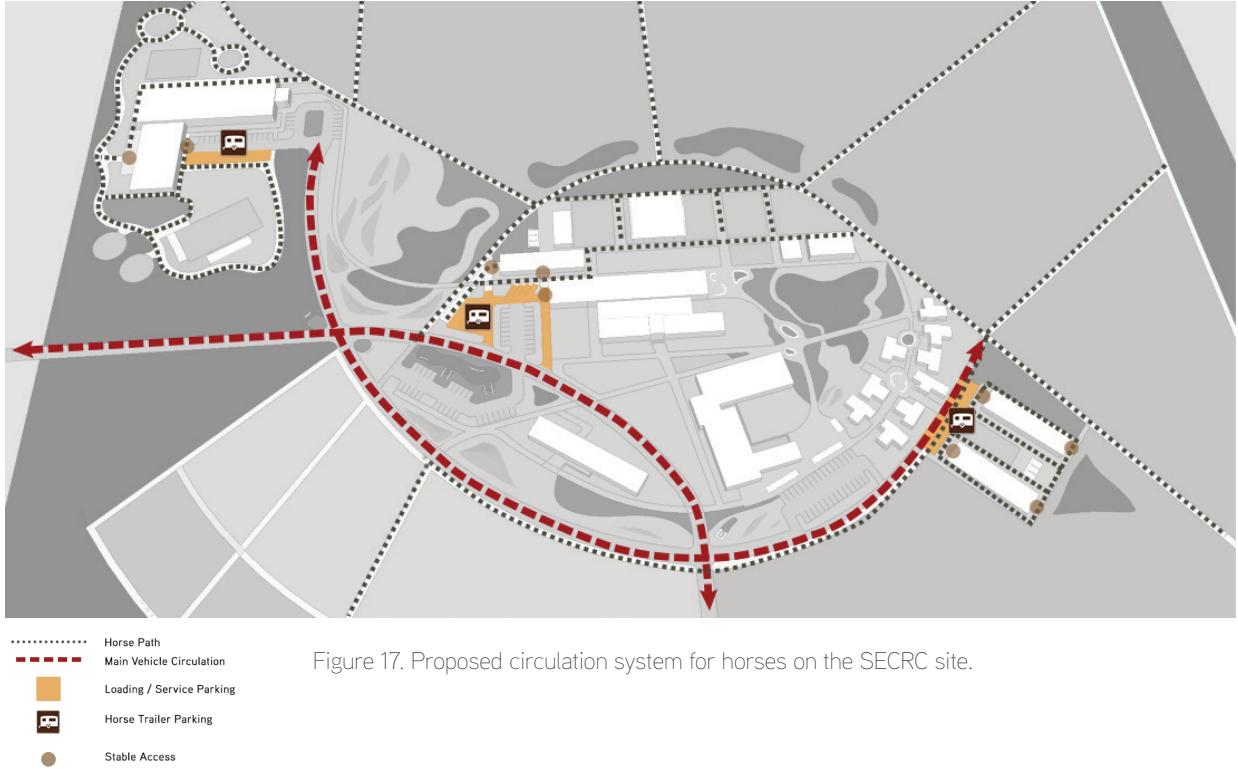


Figure 17. Proposed circulation system for horses on the SECRC site.



Figure 18. Multi-purpose path on the SECRC site.



**Nature/Horse Trail:** Along the edge of the property, north of the Research complex, is a nature trail that is roughly 0.8 miles long for both people and horses. The trail itself could be used for both research and therapeutic activities.



Figure 19. Horse trail in the wooded area of the SECRC site.

**Pedestrian Circulation:** The majority of pedestrian paths are centralized within the research complex and connects people to all of the major facilities on the site. One path towards the south end of the complex flows parallel with the inner driveway connecting the Agribusiness Lab/Center to both the Business Hive and the Village. Another pedestrian path that flows from the Agribusiness Center to the Research Hub intersects with the two other paths from both Business Hive and the Research Hub area converging at the axis which as a result creates opportunities for open space activities. A grid-like system is established for pedestrian movement behind the main Research Hub facilities and engages faculty and students with paddocks and observation spaces. There is also another pedestrian path that connects the main Research Hub and the Equine-Assisted Therapy Lab/Center, exposing users to rain garden and other natural landscape elements along the way.



## Access and Edges

Along the edges the property mainly consists of forest vegetation, water systems entering in and out of the property, and pasture land. To filter out potential pollutants, rain gardens are established to serve as an edge along the fenced horse pastures.

All of the major facilities on the site are within walking distance to parking. At the Therapeutic Lab/Center, there is parking for both cars and horse trailers adjacent to the stable entrance. At the west wing of the Research Hub facilities, parking is established for both vehicles, as well as a parking/loading area for horse trailers. The Business Hive includes parking for both cars and trucks and can be utilized for market-based events adjacent to the plaza. Within the Village is a loading area for horse trailers adjacent to two horse stables.

Throughout the places designed on the site, it will be important to identify what areas are accessible for both public and private uses. The multi-purpose paths will only be accessible for private uses for faculty, staff, students, and other service-related activities. For an inclusive and controlled environment, the sensory paths within the Therapeutic Lab/Center will also be private. One area that is designated for public and visitor access is the Business Hive, which includes both the plaza and the lawn areas enclosed by the Business Hive facility. Spaces created around the main Research Hub facilities and the Village would be defined as semi-private spaces, meaning that these areas are flexible for both public and private uses.

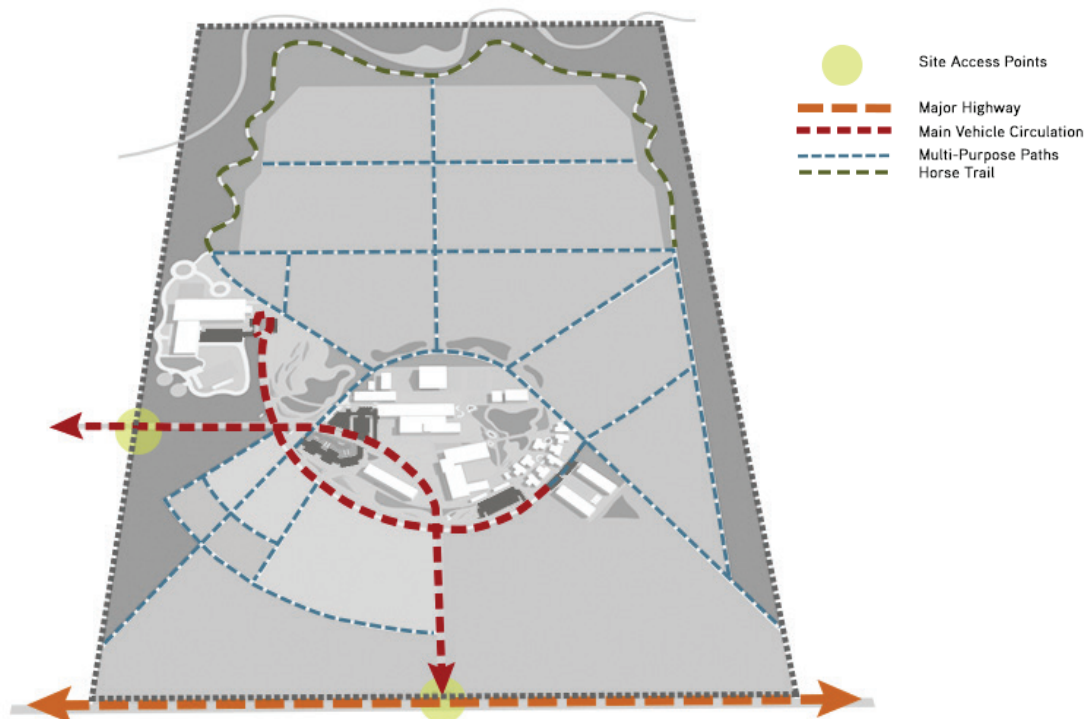


Figure 20. Proposed site access and main circulation paths for the SECRC site.

## Open Space System and Key Landscape Elements

The proposed conceptual master plan presents an open space system and landscape elements that provide access to the buildings and extends the indoor activities into outdoors. Various open space types were created including informal gathering spaces such as courtyards, open lawn spaces, as well as more programmed activity spaces such as horse paddocks, semi-covered arena, observation arenas, therapeutic sensory areas etc.

From the Business Hive, to the back of the main Research Hub facility, an open space corridor or a “thread” is proposed connecting these two entities together which include open space components along the way. At the lower end of the thread next to the Business Hive is a plaza space, which includes canopy structures for shade and a seating area. Along the thread there is an open green space that is enclosed by the U-shaped Business Hive facility. The mid-point of the thread expands into an open gathering/resting space between the main Research Hub facility and the Business Hive, creating opportunities for seating and resting near the adjacent bioretention pond area. The end of the thread opens up at the rear end of the main Research Hub facility where spaces are created for outdoor learning activities for students and faculty.



- Thread and Gathering Spaces
- Open Lawn Space
- Spaces for Equine Activities
  - 1 Horse Paddock
  - 2 Covered Arena
  - 3 Multi-purpose Space
  - 4 Observation Arena
  - 5/6 Therapeutic Round Paddock and Sensory Paths

Figure 21. Proposed open space types for the SECRC site.

Key landscape elements such as bio-retention ponds, rain gardens, elevated mounds, and specific vegetated spaces are also proposed to create unstructured fun, engaging, and pleasant spaces. These landscapes also aim to mitigate stormwater run-off on site, as well as remove the pollutants from soil and water.

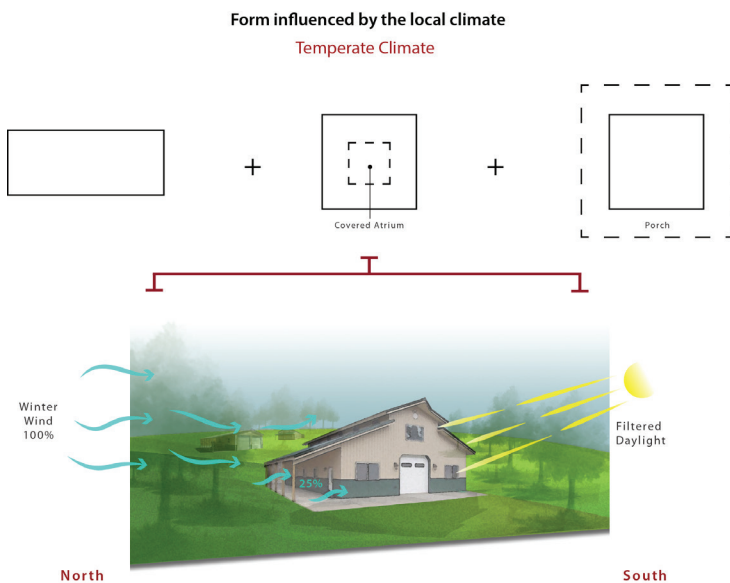


- Bio-Retention Pond
- Rain Garden / Vegetation
- Elevated Mound Topography

Figure 22. Proposed functional landscape elements on the SECRC site.

## Building Systems

The proposed buildings on the site will be designed incorporating passive sustainable design principles including day lighting and natural ventilation.



**Day lighting** – building and window placement should maximize the beneficial aspects of day light in the spaces and buffer against the negative aspects of sun exposures via the use of shading structures specifically on the south side of the buildings. These strategies will also help minimize glare, as well as heat gain that could stress the mechanical units in the buildings.

**Natural ventilation** – building orientation, window placement and landscape design should capture cooling summer breezes, while controlling the cooler winter breezes.

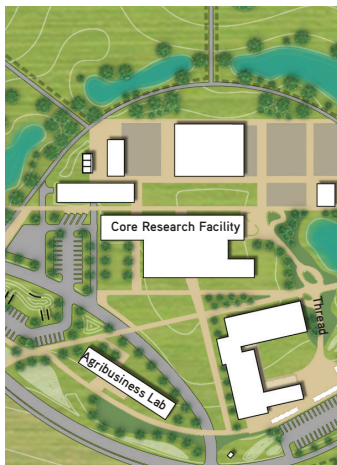
Figure 23. Proposed sustainable building design principles on the SECRC site.

# Proposed Research and Education Facilities: Building, Spatial Program and Outdoor Components

## Research Hub

The Research Hub contains four facilities: The Main Research Building, Agribusiness Research Center, the Waste Management Research Lab, and the Therapeutic Lab/Center. Each of these facilities have different research focus areas and activities but include similar or relevant spatial program and design strategies.

### a) The Main Research Facility



This core research facility has been proposed as part of the SECRC conceptual master plan to provide an efficient and cutting edge facility for conducting equine related transdisciplinary research projects for scientific advancement that will also benefit the needs of the equine community in the region. The design of the main research facility creates the focal point on the site. It is placed between Business Hive facility and the observation arenas that are also connected via a “thread”, which is part of an open space system created on the model site. This thread connects the Research Hub, Business Hive, observation arenas, and the Village as an iconic pathway and a working landscape.



Figure 24. A view from the “thread” - the Core Research Facility and the Semi-Covered Arena





Figure 25. An aerial view of the “thread”, the main Research Hub Facility and the Business Hive to the left.

A straight view of the main Research Hub building can be seen as visitors enter the complex from the main entry to the site. This commanding view of the facility helps create strong physical and visual connections for visitors entering the complex. A field of grass in front of the building creates a unique threshold effect and also minimizes the amount of maintenance required. A brick seating wall in front of the facility helps maximize outdoor activities. Open gathering lawn spaces adjacent and behind the main facility serve as a gathering spaces for expanded activities that are adjacent to the observation arenas and paddocks. Located behind the main Research Facility lies five horse paddock spaces, which include four observation paddocks, a semi-covered arena, and a flex area. These spaces can be utilized for multiple outdoor research & equine-related activities. Parking areas for both cars, trucks, and trailers are established with access to the main Research Facility, as well as the horse stable facilities.



Figure 26. The front entry of the core Research Facility.



Figure 27. An aerial view of the main Research Facility.

The proposed research facility (approximately 25,000 sq ft) will incorporate both research lab and educational spaces in support of focus areas related to equine health and science, equine manufacturing, and smart rural development. This building will include a welcoming, large atrium/gallery space, which can be utilized to exhibit information and products on the ongoing research efforts. This atrium will also serve as the main “indoor tread”, which connects various research lab wings in the building. It overlooks to two indoor enclosed courtyard spaces, which are part of the idea of “research yard” enabling researchers in residence to congregate and share their work among each other or with public. These inner courtyards also aim to provide a pleasant atmosphere with views toward the adjoining outdoor spaces and the rain garden.

# Openness.

# Linkages.

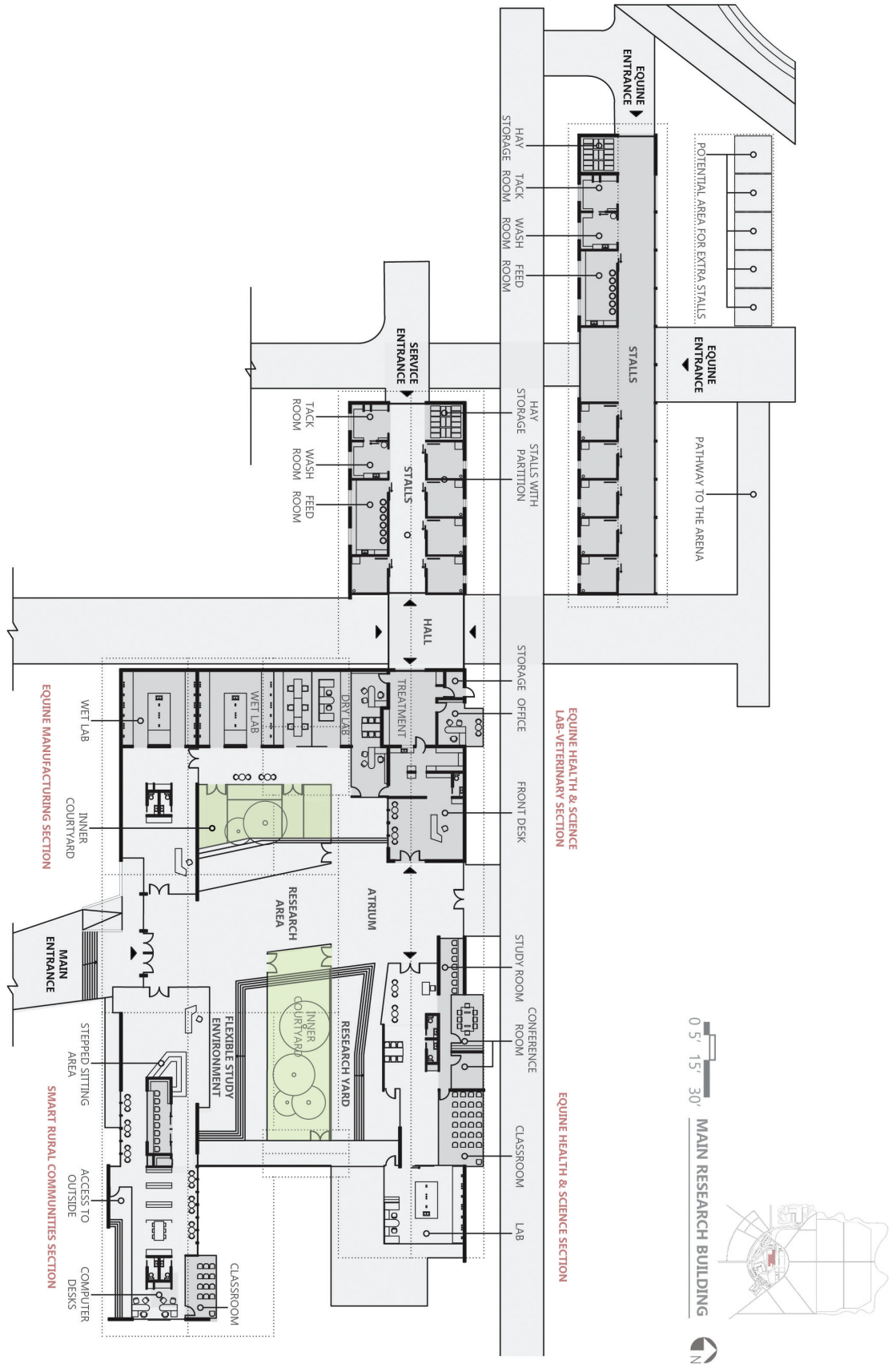


Figure 28: Plan view of the main Research Facility.





Figure 29. A view from the interior of the main Research Facility - Research Yard.

There is increasing demand for researchers and disciplines to team up and collaborate to address many of the challenges and research inquiries rather than working in siloes and independently. Many of these transdisciplinary and collaborative research efforts require flexible, open, and more connected lab spaces that also include spaces for meeting, brainstorming, ideation, co-sharing, testing, and teaching. Hence, this proposed research facility includes research lab wings, which incorporate collaborative team spaces including wet/dry labs, meeting/conference rooms, office/computer workstations, informal gathering areas, and classrooms. Each wing incorporates an entry space, which also provides privacy and security to each research area as needed. These research wings are designed to provide spaces with flexibility to change or adapt to the changing nature of research activities by researchers who will cycle in and out of the building as projects evolve. A model for physical space is outlined that is focused on this dynamic research team model that will aim to create networks, catalyze interactions, and spur multiple contacts rather than the creation of traditional individual lab spaces, which siloes the researchers. Hence, this facility is designed to provide more open, visually connected, and integrated research and educational spaces that can accommodate team and/or collaborative activities among researchers as needed.

# Flexibility.



Figure 30. A view from the interiors of the main Research Facility - Typical dry lab area.



Figure 31. A view from the interiors of the main Research Facility - Flexible study/work area in a research-lab wing.





Figure 32. A view from the interiors of the main Research Facility - Typical wet-lab area.

The proposed research building is single story envisioned as a steel frame, wood building with a gabled roof. It will have a rustic equine vocabulary, with wood siding and large windows for daylighting the indoor work spaces and the atrium/gallery space.

Behind the main Research building is the Waste Management Research Lab that includes an outdoor composting station, as well as an indoor lab space for activities related to manure management and biofuel research. Across the driveway from the main Research building is also the Agribusiness Lab, with access to hay production fields and field testing/research areas located in the front part of the property.

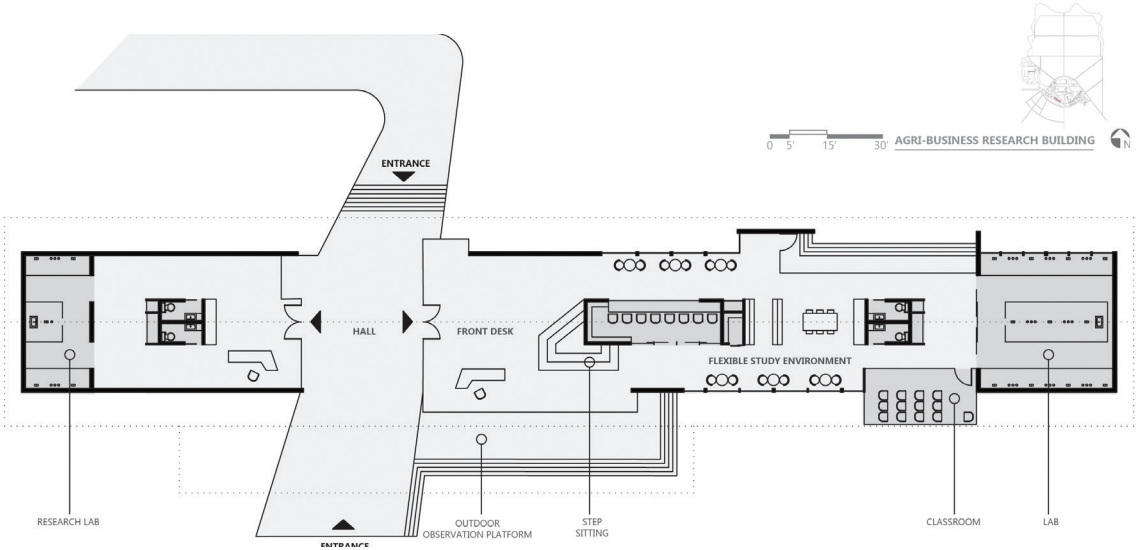


Figure 33. Plan view of the Agribusiness Research Lab area.

## b) Equine-Assisted Therapy Lab/Center



Establishing both a stress-free and controlled environment will be a key component for the proposed therapeutic center. That is why this master plan recommends that the location of the therapeutic center on the site to be isolated and separated from other programs.

The Equine-Assisted Therapy Lab/Center will aim to integrate research and education in equine-assisted activities and therapies. The building and its outdoors will be a place where people with physical, emotional, and development challenges can receive treatment from specialists. It also provides opportunities for students to be involved in hands-on educational activities, as well as enable researchers to be involved in collaborative efforts.

The proposed building will require approximately 32,181 square feet facility. This L-shaped building will include a welcoming, large atrium/gallery space displaying digital and interactive screen surfaces. The proposed plan of the building is ideal for both hands-on instructional and research activities making it a strong asset for ICC students and faculty. Number of classrooms, offices, and various meeting spaces are arranged along the main atrium/gallery space. The facility also includes two indoor and outdoor arenas, dry-lab areas, and therapy spaces along with public areas for clients and their families. Additionally, a 10-stall barn for therapy horses, round pens, an outdoor sensory path, as well as outdoor runs have been proposed.



Figure 34. A view from the atrium of the Equine-Assisted Therapy Lab/Center.



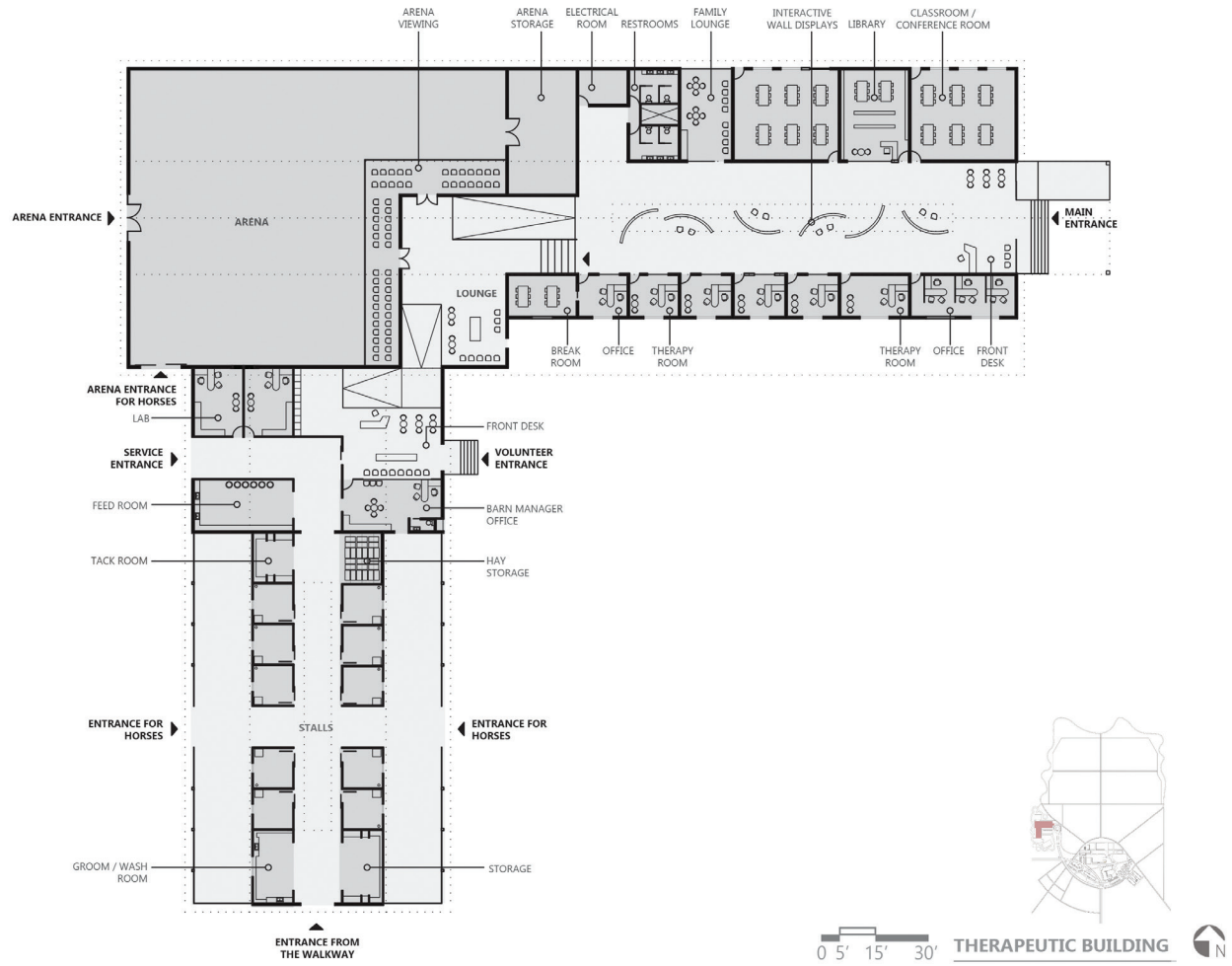


Figure 35. Plan view of the Equine-Assisted Therapy Lab/Center Facility.



Figure 36. A view from the Covered Arena of the Equine-Assisted Therapy Lab/Center Facility.



Figure 37. A view of stalls in the Equine-Assisted Therapy Lab/Center.



Figure 38. A view of the entry area of the Equine-Assisted Therapy Lab/Center site.

The building is single story envisioned as a steel frame, wood building with a gabled roof. It will have a rustic equine vocabulary, with wood siding and clerestory windows for daylighting the arena and the atrium/gallery space.

The Equine-Assisted Therapy Lab/Center has both indoor and outdoor arenas to serve for a variety of different activities and different user groups. The outdoor arena can be utilized for group riding activities, while separate round pens can be used for personalized therapeutic activities. These arenas can also provide an observation space for researchers to understand equine based therapeutic activities and human behavior.



As part of the outdoor amenities, a sensory path has also been proposed in order to help people, particularly kids with autism who often struggle in directions and communication. Professional equine assisted riding helps these individuals balance, focus, coordinate and interact with the environment through their senses during the ride or walk. Hence, it is proposed that this sensory path will include landscaping and different riding surfaces that will help engage kids with matching colors, stepping, counting as part of the types of different activities throughout the path which can engage their attention to observe and make decisions.



Figure 39. An aerial view of the Equine-Assisted Therapy Lab/Center facility and Its outdoors.



Figure 40. An aerial view of the Equine-Assisted Therapy Lab/Center Outdoors - sensory paths, open arenas, paddocks.





Figure 41. A view of the sensory paths around the Equine-Assisted Therapy Lab/Center facility.

## Business Hive Facility



The proposed Business Hive facility is first introduced with a statue of a horse (similar to other existing equine-statues within the region) that functions as a gateway entry into the overall SECRC site. The design of this collective facility incorporates the idea of a community-oriented space that embraces cultural and entrepreneurial activities in an equine-based economy. Both indoor and outdoor spaces are designed and planned spatially to create unique experiences and collaborative environments for both local residents, visitors, faculty, and students alike.



Figure 42. A view of the gateway entry to the SECRC site.

The 17,000 square foot U-shaped building offers community oriented spaces and activities that sets the pulse for the entire site. The main entry to the building is a visitor center, which also serves as the main entry space for both Equine Museum and the Business Incubator spaces. This main entry area includes a souvenir shop, as well as a small coffee kiosk. The museum and business incubator offices are located on separate wings. The museum incorporates combination of open, flexible, and semi-fixed exhibition spaces with visual and physical access to the outdoor courtyard area. This courtyard provides an opportunity for extending the exhibition opportunities into the outdoors, which can also serve as event space as needed. The business incubator, on the other hand, incorporates both indoor and outdoor group/team work spaces, conference/meeting rooms, a multi-functional space for events/workshops, as well as individual enclosed office spaces. The workspaces primarily are designed using the open space concept to trigger collaboration and sharing among entrepreneurs, small business owners etc. The business incubator section also has a separate entrance toward the front, as well as the open spaces created for activities such as local farmers and artisan market.

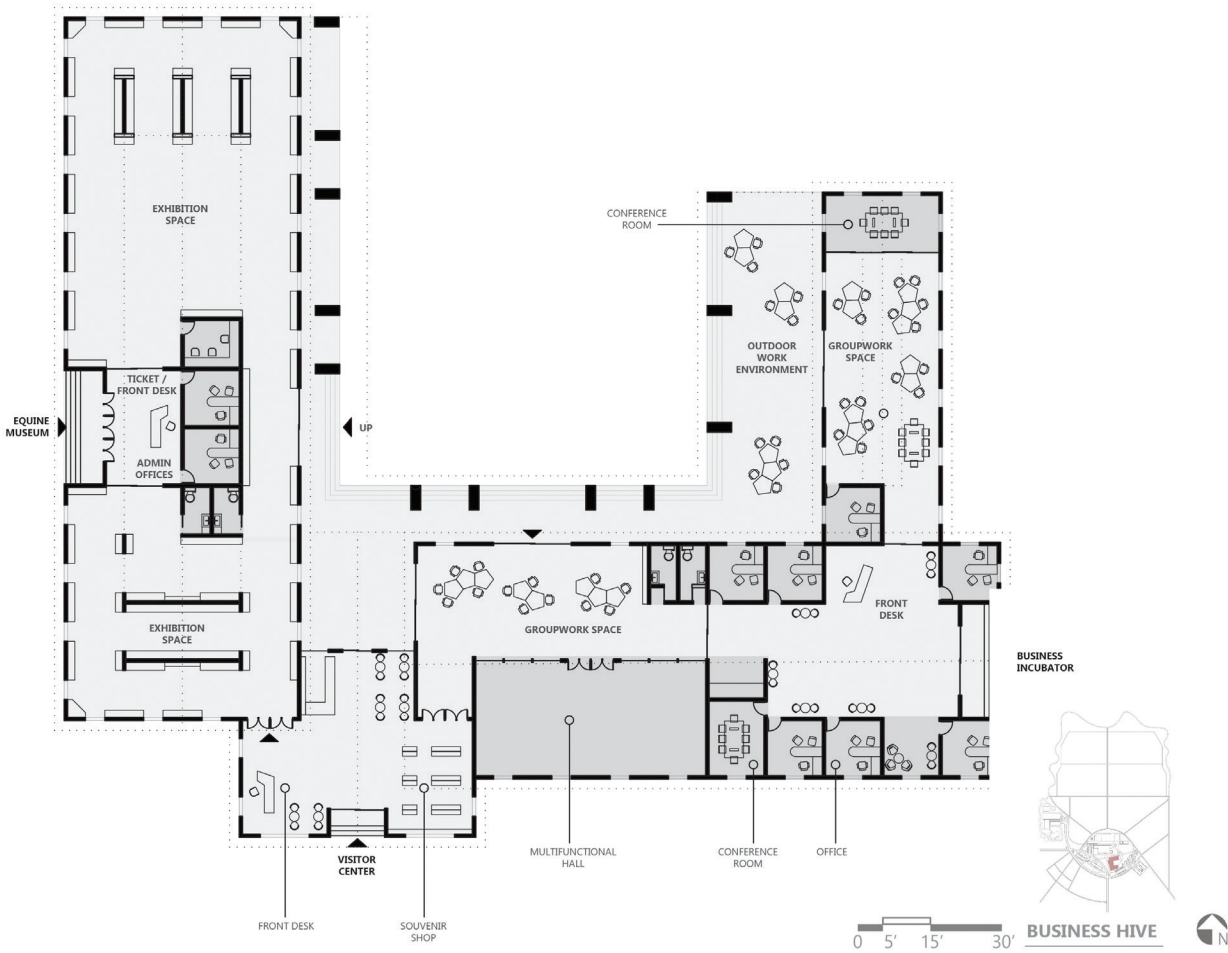


Figure 43. A plan view of the Business Hive facility.





Figure 44. A view of the entry area toward the Business Hive facility.



Figure 45. An aerial view of the Business Hive facility and its outdoors.

The open space next to the second entry of Business Incubator facility includes the canopy structures that help create a “farmers market” environment, where local farmers and artisans can offer their products to visitors in these spaces. Adjacent to the designed canopy structures is a plaza space that includes seating areas to help maximize and complement activities within a market environment. Enclosed within the Business Hive facility is a lawn space (internal courtyard) that can maximize the outdoor activities for special outdoor events. All of these outdoor spaces are designated for public activities and are separated from other nearby private research functions on the site. Overall, this area presents visible, civic, and welcoming spaces to the surrounding community. All of these uses, supported by well-designed spaces, can help encourage community interaction on the site.



Figure 46. A view of the outdoor gathering space - the Market Area.

## The Village Facilities



The village is a cluster of different cottage buildings and common pantry house that can house faculty, students, and athletes for overnight stay. The cottages have close walking access to a main common pantry house, two horse stables, and an exercise paddock that can be utilized by guests, athletes, etc. The horse stables and cottages are connected by a pedestrian axis corridor, which includes views of the rain garden from the horse stable complex.



Plots of small-scale courtyard spaces are scattered between cottages along the main pedestrian corridor. These small spaces are created to encourage passive outdoor activities and gathering spaces for residents. These small-scale courtyards connect the blocks in a way that the design creates a spatial collaborative environment. At the center of the Village lies a gathering space where people can explore a variety of different outdoor and engagement activities.



Figure 47. An aerial view of the Village area.



Figure 48. A view of the outdoor gathering space - the Village area.

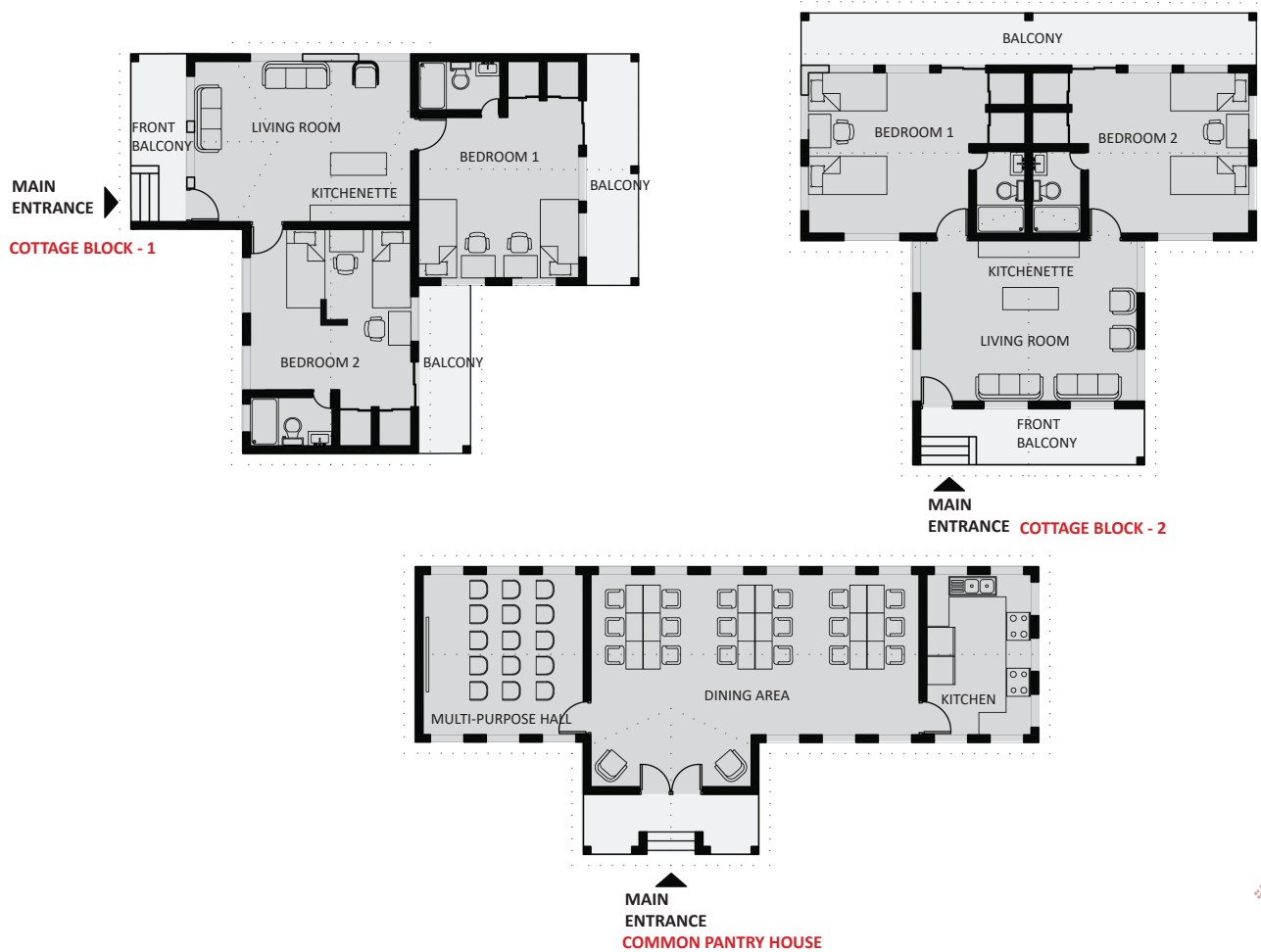


Figure 49. A plan view of the Village cottage buildings and common pantry house.

## Expected Impacts of the Proposed Master Plan

It was the goal of this planning and design process to conceptualize how the future site could best support the holistic vision created for the new Southeast Equine Community and Research Center (SECRC). The site planning and design process helped to investigate ways in which new structures, open spaces, fields, and surrounding areas could facilitate opportunities to support that vision of the future center. It is our hope that the key stakeholders can use the proposed concepts in this report to assist in cultivating partnerships with diverse stakeholders able to contribute to the realization of the proposed vision. It is also our hope that this vision inspires and guides the future efforts and help securing funding for site selection and the refinement of the proposed design concepts.





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# Appendix

## Equine Assisted Activities: A Proposed Strategic Plan for Harnessing the Power of Equines in Human Health

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Over the last 30 years equine assisted therapy has evolved into a dynamic therapeutic option (Bizub, Joy & Davidson, 2003). Utilizing equines in therapeutic settings has garnered much attention as the application of, and outcomes associated with, horse and human interaction becomes a more common intervention for the treatment of a variety of physical, cognitive, and mental health issues. Although research in this area is emerging, it spans the human experience, including: victims who have experienced sexual violence (Kemp, Signal, Botros, Taylor & Prentice, 2014), veterans (Lanning & Krenek, 2013), children (Lentini & Knox, 2015), individuals with PTSD (McCullough, 2011), at-risk youth (Burgon, 2011; Maujean et al. (2013)), people with autism (Anderson & Meints, 2016), people with cerebral palsy (Zadnikar & Kastrin, 2011), court involved youth (Hemingway, Meek & Hill, 2012), patients with eating disorders (Christian, 2005) and business executives (Kelly, 2014).

As activities utilizing equines in therapeutic contexts increases worldwide, what we “know” about an equine’s influence on human health becomes increasingly complex. To date, there are numerous approaches to utilizing equines in human care. These modalities have been categorized into the following areas: equine-assisted physical therapy, equine assisted occupational therapy, equine assisted speech therapy, equine assisted mental health, equine assisted learning and therapeutic riding (Hallberg, 2018; See Table 1). These approaches assess and treat a number of physical, cognitive, language development, and mental health disorders, yet these applications are not governed by one overarching body. The most common and reputable organized bodies that train practitioners include: Professional Association of Therapeutic Horsemanship (PATH), Equine Assisted Growth and Learning Association (EAGALA), Natural Lifemanship (TF-EAP), Eponaquest, OK CORRAL, Human-Equine Alliances for Learning (HEAL), Human-Equine Relational Development Institute (HERD). Ultimately, these modalities, and the people who lead them, encompass differing viewpoints on the process of the therapy and the role of the horse. Often times, implementation in practice depends on the training a therapist or facility has encountered. This varies from person to person, farm to farm, facility to facility. (i.e., professional organizations with curricula and certifications, nonprofit organizations serving a particular population that might draw from a combination of modalities, and/or individual therapists with training in clinical work, but who have limited knowledge about using equines in therapy).

Although decades of research indicate meaningful benefits for humans, in 2001 we begin to see the first published studies that focus on human mental health. Equine facilitated mental health, also known as Equine

Assisted Psychotherapy (EAP) is one of the fastest growing components in today's animal assisted therapy industry (Professional Association of Therapeutic Horsemanship, 2017). The consensus is that that therapeutic work with horses improves self-confidence and self-esteem (Chandler, 2005), cultivates conflict resolution skills and relationship skills (Kersten & Thomas, 2004). Equine and human pairings also help to reduce distress (Klontz, Bivens, Leinart & Klontz, 2007) and mitigates maladaptive behaviors (Anderson & Meints, 2016). Interestingly, engaging in EAP has been shown to sustain higher retention and engagement rates than traditional talk therapy (Lentini & Knox, 2015). However, there is little agreement that equine assisted psychotherapy is an evidenced based treatment or on the best practices associated with this treatment (Letini & Knox, 2015; Anestis et al., 2014). Given this framework, there is much to be accomplished in the research and education of equine assisted therapies. In alignment with the literature on equine assisted therapies, we outline five comprehensive areas of focus that guide a 3-year strategic plan for equine therapy research and education with the Southeast Equine Research and Education Partnership.

There are opportunities for the Center to:

- Engage in evidence based studies to organize knowledge and legitimize treatment and practice (Anestis et al., 2014). Many of the published articles have small sample sizes, heterogeneity across populations (e.g., lack of diversity in the sample's demographics) and anecdotal data (i.e.,g lack of rigorous qualitative and quantitative research design and implementation) (Pauw, 2000).
- Investigate the role of the horse, as it varies in different therapeutic modalities. Some practitioners view the horse as a machine or a tool giving a specific movement (Uchiyama, Ohtani & Ohta, 2011), where others view the horse as an equal sentient being on the therapy team (Frewin & Gardiner, 2005).
- Provide space for practitioners, leaders, and organizations that provide equine assisted interventions to collaborate and organize working knowledge on the industries best practices. Currently, there is disorganized and contradictory knowledge on best practices (Letini & Knox, 2015).
- Engage in equine facilitated activities that serve different people groups, in varied contexts, through diverse modalities. From Hippotherapy where licensed health professionals work with clients on movement and balance (Zadnikar & Kastrin, 2011) to equine assisted psychotherapy where psychotherapists work one-on-one with traumatized clients on healthy relationship building and communication skills (Kersten & Thomas, 2004; Chandler, 2005), to equine assisted learning where educators teach conflict resolution to business executives and employees (Kelly, 2014).
- Identify and engage populations of people that could benefit from equine assisted activities that might typically self-select out of interacting with equines. For example, how might the Center be a place where individuals with allergies to equines, or immunocompromised individuals, be able to benefit from interactions with equines. Or, how might we provide guidance and education for individuals that have a history of animal mistreatment (Morrison, 2007).

The national and international conversation around equines and human mental health is ongoing and vitally important to the health and well-being of both humans and equines. The SEREP Center has the potential to not only join this conversation, but to be a world leader in research on Equine Assisted Activities. Below we outline a general strategic plan for continuing these efforts at the local, state, and national level.

## Equine Assisted Activities for Research and Education Center Three - Year Strategic Plan Overview

	Year #1	Year #2	Year #3
<b>Goal #1- Local Focus</b>	<ul style="list-style-type: none"> <li>- Host an “Open House” event for the local community.</li> <li>- Identify potential partnerships with FENCE, TROT, and Isothermal Community College (e.g., possibly a co-sponsorship for the open house event)</li> </ul>	<ul style="list-style-type: none"> <li>- Plan for a pilot program with local participants, partnering with local agencies</li> <li>- Continue to development partnerships with FENCE, TROT, ICC</li> </ul>	<ul style="list-style-type: none"> <li>- Begin “normal operations” at the center.</li> <li>- Sustain partnerships with FENCE, TROT, ICC</li> </ul>
<b>Goal #2- State Focus</b>	<ul style="list-style-type: none"> <li>- Develop a database of all programs and individuals that are practicing EAP/EAL/TR across the state of North Carolina.</li> <li>- Begin Research efforts (e.g., recruiting EAP/EAL/TR facilities for program assessment).</li> <li>- Locate and apply for state funding for continued research.</li> </ul>	<ul style="list-style-type: none"> <li>- Host an EAP/EAL/EAA/TR conference at the center inviting all the programs across the state.</li> <li>- Share research findings at conference. Highlight leading practitioners in the state, provide opportunities for networking.</li> <li>- Locate and apply for state funding for continued research.</li> </ul>	<ul style="list-style-type: none"> <li>- Begin “normal operations” at the center.</li> <li>- Implement evidence-based findings into practice at the Center with an EAA/EAP pilot program serving community members; new research efforts at the Center (e.g., experimental design, control groups).</li> <li>- Locate and apply for state funding for continued research.</li> </ul>
<b>Goal #3- National Focus</b>	<ul style="list-style-type: none"> <li>- Begin communication efforts spreading the knowledge that SEREP exists, its goals and future opportunities.</li> <li>- Locate and apply for funding through national grants (e.g., NIH, Horse and Human Research Foundation, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>- Develop a database of all programs that are practicing EAP/EAL/TR across the United States.</li> <li>- Locate and apply for funding through national grants (e.g., NIH, Horse and Human Research Foundation, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>- Host an EAP/EAL/EAA/TR conference at the Center inviting leading researchers and practitioners from across the country.</li> <li>- Locate and apply for funding through national grants (e.g., NIH, Horse and Human Research Foundation, etc.).</li> </ul>

## YEAR 1:

### “Open House” Event

- Invite stakeholders and members of the community to attend and to present
  - Local trainers, veterinarians, trimmers/farriers, etc.
  - Co-sponsorship with FENCE, TROT, ICC, and/or other local organizations
- Demonstrations of multiple types of EAA/T
- Classroom style presentations on multiple aspects of EAA/T

### Develop a database of all programs and individuals that are practicing EAP/EAL/TR across the state of North Carolina.

- Internet Search with different key terms (Equine therapy in NC, Horse therapy in NC, Equine Facilitated Psychotherapy in NC, Equine Assisted Learning in NC, etc.)
- Search “Find a Practitioner” Databases in the major modalities (EAGALA, PATH, OK Corral, HEAL, HERD, etc.)
- Post in active Equestrian Facebook groups (Triangle Area Equestrians, Triad Area Equestrians, NC Horse Council, etc.) to ask if they know of or are anyone practicing EAA/T
- Create a master list of all centers/programs in the state along with the contact info, the type of program/services provided and the modality that they use
  - After list is created, reach out to all organizations to ensure information is correct and to let them know that SEREP exists

### Begin communication efforts, branding the EAA component of the Center, communicating goals and future opportunities.

- Reach out to the programs and centers across the state (as outlined above)
- Visit horse events across the state (shows, events, vet school open house, clinics, etc.)
- Make connections with potential community partners (therapists, court counselors, police departments, local law enforcement, etc.)
- Develop communication plan for EAA and the Center (branding, social media presence, promotion)

### Begin research efforts, recruiting state facilities for program assessment, and locating and applying for research funding.



## YEAR 2:

Plan for a pilot program with local participants, partnering with local agencies

- Determine program most needed in the local community
  - What population should be served?
  - What modality should be explored first?
- Determine staffing and facility needs (horse and human) for the particular program
- Develop a plan to run said program in Year 3

Host an EAP/EAL/EAA/TR conference at the center inviting all the programs across the state.

- Round table discussions
- Panel Discussions
- Question and Answer with key leaders in the industry
- Invite practitioners to present their models in mini lecture series

Develop a database of all programs that are practicing EAP/EAL/TR across the United States.

- Internet Search with different key terms (Equine therapy, Horse therapy, Equine Facilitated Psychotherapy, Equine Assisted Learning, etc.)
- Search “Find a Practitioner” Databases in the major modalities (EAGALA, PATH, OK Corral, HEAL, HERD, etc.)
- Post in active Equestrian Facebook groups to ask if they know of or are anyone practicing EAA/T
- Create a master list of all centers/programs in the state along with the contact info, the type of program/services provided and the modality that they use
  - After list is created, reach out to all organizations to ensure information is correct and to let them know that SEREP exists
- Create an interactive space (online group, forum, database, website etc.) to house all of the information and to encourage connection and collaboration from all

Continue research efforts, recruiting state facilities for program assessment, developing the EAA program at the Center for potential research samples (e.g., experimental and control groups) and locating and applying for state and federal research funding.

## YEAR 3: Defining “normal operations” at the center

For the first 6-months of year 3, the center will analyze the work thus far. By thoroughly considering the effectiveness of the databases created, networks attained and pilot program completed, the center will be able to propose how it best fits into the community. The following plan outlines potential options for “normal operations.”

1. The center will act as a research lab for equine assisted activities.
2. The center will provide EAA/T services to the local community.
3. The center will be a network hub for those practicing EAA/T across the state and nation.

**Potential Organizational Staffing** (if offering a full range of equine assisted activities to the public):

1. Executive Director
  - a. Business Director
  - b. Communication Director
  - c. Health Director
    - i. Licensed Mental Health Professional
    - ii. Licensed Occupational Therapist
    - iii. Licensed Physical Therapist
2. Equine Director
  - a. Barn Manager
  - b. Facilities Manager
  - c. Equine Specialists
  - d. Therapeutic Riding Instructors

**Potential Horse Needs:**

- 2 Resident Herds- 12 horses total
  - 6 horses best fit for Therapeutic Riding Curriculum
    - Partner with local community to take horses that are entering retirement and/or not able to do their jobs anymore
    - Very well trained
  - 6 horses best fit for Equine Facilitated Activities
    - 3 rescues from difficult situations
    - 3 horses with a known history
    - Training not necessary
  - If additional horses are needed, the center could partner with local farms and horse owners for access and use of their horses.

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**Table 1 - Common definitions for Equine Assisted Activities and Therapies**

Term	Definition
Equine Assisted Physical Therapy	“This term describes the inclusion of horses in a physical therapy service. Physical therapy uses treatment techniques to promote the ability to move, reduce pain, restore function and prevent disability” (p.7).
Equine Assisted Occupational Therapy	“This term describes the inclusion of horses in an occupational therapy service. Occupational therapy addresses physical, psychological, and cognitive aspects of well-being” (p.7).
Equine Assisted Speech Therapy	“This term describes the inclusion of horses in a speech, language or hearing therapy service. Speech language pathologists treat speech, language, social communication, cognitive communication and swallowing disorders” (p.7).
Equine Assisted Mental Health (aka- Equine Assisted Psychotherapy)	“A term that is used to describe any type of mental health service that includes horses or the farm milieu. Mental health services are provided by professionals who have graduated from an accredited education program and are allowed by law to include mental health treatment as part of their scope of practice” (p.7).
Equine Assisted Learning	“A type of equine assisted activity that broadly refers to non-therapy, skills-based services that focus on teaching life skills, social skills, communication skills, relationship skills, or leadership skills while facilitating personal growth and increased self-awareness through both mounted and unmounted interactions with horses” (p.7).
Therapeutic Riding (aka adaptive riding)	“Non-therapy skills based service in which specially trained instructors teach horseback riding and horsemanship skills to students with disabilities or special needs” (p.4).

*Note: All definitions found in Hallberg (2018).*

# Acknowledgements

NC State University is committed to research and scholarship efforts of its faculty and students toward the enhancement of communities in the State of North Carolina. Community development and design projects are conceived to empower the communities with the tools necessary to craft a vision and direct their own futures – as well as to develop and maintain a pride of place!

A community exists as a manifestation of its cultural, social, economic and physical attributes. Conceptual design projects and visioning processes assist a community in orchestrating the specific interests and activities of groups or individuals in the community within a shared vision of the community's character, its present and future.

This effort provides a conceptual framework for establishing a new Southeast Equine Community and Research Center (SECR) focused on horse, human, and environmental health. Creating new economic opportunities, building on the existing equine culture, and enhancing the character of the built environment are the main focal points of this project. The project aims to help the Isothermal Community College (ICC) engage in organized and proactive discussions about the future of the new SECR.

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The Southeast Equine Research and Education Partnership was a reflection of the dreams and aspirations of many people who are devoted to improve the Isothermal community and its assets. NC State University remains committed to working in partnership on the next steps in turning this vision into a reality.



