Project Name:
Innovation Partnership Building, Technology Quadrant Phase III
Master Plan for Tech Park "MP" Report

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The University of Connecticut

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INTRODUCTION
Executive Summary

This Master Plan report for the University of Connecticut Tech Park is part of a three-pronged effort to create a framework for future development of the North Campus and a foundation for the Phase 1 Innovation Partnership Building. The three components of the study’s scope of work are: Master Plan, Programming for the Phase 1 Building and Site Evaluation and Selection for Phase 1.

The Tech Park is an important initiative for both UConn and the State of Connecticut. Through collaboration with industry partners and entrepreneurs, the Tech Park will spur advances in manufacturing and advanced product development. It is expected to lead to the creation of thousands of new jobs and will also improve the State’s global competitiveness.

Through a highly interactive process involving representatives of UConn, the Town of Mansfield and the design consultant team, the North Campus has been analyzed and evaluated within the context of the University, the Town and the requirements and goals for the Tech Park. The ideas and recommendations put forth here are the product of collaboration between experts and stakeholders. The result is a framework for the Tech Park and the Phase 1 Innovation Partnership Building that will serve as the first step in creating a bridge between the Town and the University, University and Industry, Industry and Science, and Science and Engineering. The Tech Park will be a place of investigation, cross-disciplinary interaction and discovery - a place that, through its facilities and synergies, will bolster UConn’s role as a leader in technology and manufacturing innovation.

The framework of the Tech Park is based on the following goals and objectives:

- Develop a comprehensive and flexible developmental framework
- Allow for multiple scenarios
- Create a new campus center
- Create a campus plan that fosters interaction, collaboration and synergies
- Engage UConn’s central campus and the town of Mansfield
- Accommodate vehicular, pedestrian and bicycle circulation
- Verify capacity of systems and infrastructure
- Establish a clear organizational concept
- Develop a hierarchy of spaces and paths
- Articulate a plan of conservation and development

The Master Plan is based on the idea of creating a “community of innovation.” This idea is supported by both organizational and development strategies. The organizational strategy is based upon the idea of forming “neighborhoods” that create enough density to support interaction, collaboration and a vibrant sense of community. The 900,000sf of program is distributed into three distinct clusters that are arranged along North Hillside Road. These three neighborhoods are organized around central green spaces and connected and unified by an experiential pedestrian network that will weave through the varied landscapes of the North Campus.
The development strategy is founded on the idea of flexibility – utilizing the facilities, adjacencies, accessibility and the size of the Tech Park to attract a broad range of partners with different foci, needs and business models.

Along with the tremendous opportunities that are implicit in the Tech Park Master Plan, there are also challenges that will need to be addressed. An example is the need to provide adequate infrastructure for the 900,000sf development. An important aspect of this will be water supply – an issue that the University is actively exploring. Another challenge will be that of providing necessary parking without compromising the natural beauty of the North Campus.

Ultimately, the UConn Tech Park will be a dynamic and unique new center that celebrates both the power and possibilities of science and engineering as well as that of nature. The Master Plan will optimize:

- A critical mass of scientists, engineers, faculty and students
- Adjacencies to the University and Town of Mansfield
- The natural beauty of the site

The result is a unique community of innovation that positions UConn and the State of Connecticut to contribute to and benefit from exciting advances in science and advanced manufacturing.

It should be noted that this Master Plan is intended to be a “living document.” As the Tech Park Business Plan and governance crystalize, as industry partners emerge and as further progress is made on major infrastructure issues, this document will be updated and refined. Informed by these and other relevant developments, the flexible framework of the UConn Tech Park Master Plan will continue to evolve with further expansion of design guidelines and standards for the Tech Park and North Campus Master Plan.
North Campus Aerial

The North Campus covers 514 total acres bounded by North Eagleville Road to the South, Route 44 to the North, 195 to the East and wetlands and residential properties to the West. Largely undeveloped, the area is comprised primarily of woodlands, wetlands and farm lands with a rolling topography. The total land area in parcels A-L is 233 acres. Between area slated for conservation and required setbacks from wetlands, the total buildable area is approximately 129 acres.
North Campus Plan

The Tech Park Master Plan considers previous reports and studies for the North Campus including:

- Feasibility Study For a Research and Technology Park at the University of Connecticut
- Executive Summary of NEPA FEIS prepared by Fuss and O’Neill
- North Campus/Depot Campus Outlying Parcels Master Plan – June 2000

The Fuss + O’Neill Master Plan divided the 233 acre North Campus into nine parcels with a new road (North Hillside Road) connecting the main campus to Route 44.
Master Plan Guiding Principles

- Establish a clear organizational concept
- Develop an articulated hierarchy of spaces and paths
- Create a humane campus in scale, function and materials
- Provide a flexible framework to accommodate future university needs
- Articulate a plan of conservation and development
- Create a bridge between the Tech Park and the community of Mansfield
North Campus Plan

The Tech Park Master Plan organizes the 900,000 GSF program into 3 distinct “neighborhoods” or building development clusters.
Project Goals and Objectives

• Develop a comprehensive and flexible developmental framework
• Allow for multiple implementation scenarios
• Create a new campus center
• Create a campus plan that fosters interaction, collaboration and synergies
• Engage UConn’s central campus and the Town of Mansfield
• Accommodate vehicular, pedestrian and bicycle circulation
• Verify the capacity of systems and infrastructure
• Establish a clear organizational concept
• Develop a hierarchy of spaces and paths
• Articulate a plan of conservation and development
• Establish the location of the Phase 1 Innovation Partnership Building
• Define the program for the Phase 1 building
• Establish a conceptual organization for the Phase 1 building
Research Goals and Objectives

• Enable scientists and engineers to create advanced materials
• Accelerate innovation in industry, from startups to mid-size and large corporations
• Leverage key research and development advances into commercial products
• Support collaborative research and development activities among university, industrial and entrepreneurial partners
• Provide agile and flexible-use tenant laboratories for a spectrum of industry partners
• Create a unique collaborative specialty core facility that is a complementary yet competitive regional resource
• Enhance Connecticut’s global competitiveness and the state’s future economic growth
• Secure UConn’s position as a leader in high-tech innovation and as a key R&D partner to key industries
• Create a modern platform for collaborative research, a living laboratory, and a showcase for breakthroughs
ANALYSIS + KEY FINDINGS
Key Findings & Analysis

The analysis for the Tech Park Master Plan began with an understanding of the site within the larger context of the State of Connecticut and the region. With 800 related companies within a 120-mile radius, the Tech Park has a large pool of potential partners from which to pull.

Further analysis focused on the town of Mansfield— from an overview of the town’s character, open space network and natural habitat to development projects that are planned or on-going. Dialogue with town representatives furthered an awareness of local interests with respect to general issues of development and that of the UConn Tech Park in particular. The context of the Uconn Stors Campus was also analyzed as well as the immediate context of the North Campus itself.

Through discussions with the University, Town and the consultant team, the following issues emerged as key findings. They have served to impact the Master Plan design and will continue to shape the Tech Park development over many years to come:

- **Natural Setting**- The North Campus is comprised of some 300 largely undeveloped acres. The heavily wooded site is characterized by a rolling topography, some farmland and extensive wetlands which impact the development area and the size and shape of the building parcels. The natural beauty of the North Campus is one of its greatest assets. Accommodating significant development without compromising its character will be an important challenge.

- **Infrastructure**- For this development of 900,000sf, there are numerous infrastructure issues that will need to be addressed as the planning and development of the North Campus progress. From the extension of North Hillside Road to considerations regarding Utilities, Storm Water and a potential central plant, near and long-term strategies must be considered. However, the primary and immediate concern for the Tech Park (and UConn) is the limited water supply. The University is aware of this issue and is actively weighing strategies to address it.

- **Density, Connectivity and Community**- In contrast to the Master Plan by Fuss and O’Neil which presented a collection of buildings in relative isolation from each other, a strategy of creating greater density and connectivity will foster more interaction and a real sense of vibrancy. In addition, creating connections with the Central Campus and the Town of Mansfield will be important opportunities to integrate the Park with its larger context. Through density and connectivity, the Tech Park will have a sense of place and community where ideas are the currency of exchange.

- **Parking** - The impact of parking on the Master Plan and the character of the North Campus should not be underestimated. Balancing the convenience of Tech Park users with the preservation of the site’s natural beauty will be a challenge in this heavily wooded area. While multi-story parking structures would ease the demand of land for parking, their additional cost must be factored into the overall cost model strategy to determine its impacts on the Tech Park’s ability to attract tenants and developers. In the long-term, a solution that involves some remote parking with shuttle bus service may also be considered as the Tech Park begins to reach a critical mass.

- **Flexibility** – The ability of the Tech Park to attract and accommodate a wide range of industry partners and facilitate a wide range of science and manufacturing will be crucial to its success. Furthermore, the ability of the Master Plan to accommodate various development scenarios will better encourage developers and potential anchor tenants to become a part of this dynamic community.
Livability Principles
The town of Mansfield and the University of Connecticut will collaborate together using the HUD Partnership for Sustainable Communities six livability principles in order to ensure that long term development of both the Tech Park and the town are supported. The principles used to integrate the Tech Park and the town are as follows:

- Provide More Transportation Choices. Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our Nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

- Promote equitable, affordable housing. Expand location - and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility, improve access to jobs, expand educational opportunities, and lower the combined cost of housing and transportation.

- Enhance Economic Competitiveness. Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs of workers, as well as expanded business access to markets.

- Support Existing Communities. Target federal funding toward existing communities—through strategies like transit-oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and to safeguard rural landscapes.

- Coordinate Policies and Leverage Investment. Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices, such as locally generated renewable energy.

- Value Communities and Neighborhoods. Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.
Regional Context

UConn North Campus as the heart of the Primary Technology Center:

- Hartford
- New Haven
- Worcester
The state of Connecticut is home to the University of Connecticut Storrs’s campus in addition to UConn’s five regional campuses. Storrs is located in Tolland County within the town of Mansfield.
Mansfield, CT

- Population of 26,453 (according to 2010 census)
- Town of Mansfield contains the historic village of Storrs, home to the University of Connecticut.
- Area of 45.5 sq.miles.
Historic Villages or Hamlets
Medium to High-Density Institutional/Mixed-Use
Low Density Residential
Medium to High-Density Age Restricted Residential
Medium to High-Density Residential
Planned Business/Mixed Use
Planned Office/Mixed Use
Agriculture/Medium to High-Density Residential/Open Space
Neighborhood Business/Mixed Use
Flood Hazard Zone (Depicted for Reference Purposes)
Mansfield Zoning Map

- Residential 20 Zone (R20)
- Residential 90 Zone (R20)
- Rural Agricultural Residence 90 Zone (RAR-90)
- Design Multiple Residence Zone (DMR)
- Planned Business 1 Zone (PB-1)
- Planned Business 2 Zone (PB-2)
- Planned Business 3 Zone (PB-3)
- Planned Business 4 Zone (PB-4)
- Planned Business 5 Zone (PB-5)
- Neighborhood Business 1 Zone (NB-1)
- Neighborhood Business 2 Zone (NB-2)
- Business Zone (B)
- Professional Office 1 Zone (PO-1)
- Professional Office 3 Zone (PO-3)
- Storrs Center Special Design District (SC-DD)
- Industrial Park Zone (IP)
- Research and Development Limited Ind. Zone (RD/LI)
- Flood Hazard Zone (FH)
- Institutional Zone (I)
- Aquifer Protection Area
Mansfield Downtown Partnership

Storr Center Development

- Mixed Use Town Center with restaurants, shops, offices, homes, greenspace.
- Development has ±700 units, ±200,000 square feet of commercial space
Outdoor Space in Mansfield

• Mansfield Hollow Lake
• Mansfield Hollow State Park
• Fifteen town parks and preserves
• Joshua Tract Conservation and Historic Trust properties
• University of Connecticut land holdings
Protected Forests

Shelter Fall Park

UConn Forest
Nelson Brook

Fern communities prefer high soil moisture content and can be found along brooks, wetlands, and lowlands areas.

Cider Swamp Brook

Wetland forest communities prefer wetter soils with flatter topography and are dominated by birch and high bush blueberry shrubs.

Hardwood forest communities are dominated by maples and oaks with rich understories.

UConn forest lands support trees up to 110 years old
Important Habitats in Connecticut

Upland Forest

• Represents 60% of the vegetation type in the state
• Dominated by 80-100 year old trees
• Privately-owned forests (i.e., UConn forest) account for 83% of the state’s forest
• 85% of all forests are being fragmented into sites less than 20 acres, as a result of development
• Key sub-habitats for wildlife include: dry oak forests, calcareous forests, coniferous forests, and old growth forests
Important Habitats in Connecticut

Forested Inland Wetlands

- Characterized by wetland soils
- Dominated by evergreen or deciduous trees
- Connecticut only has about 10,000 acres of forested inland wetlands remaining
- Red-maple forested wetlands are most common
- Early Successional Habitats- old farm fields
Important Habitats in Connecticut

Shrub Inland Wetland

- Characterized by wetland soils
- Shrub layer forms more than 25% of the canopy cover
- Herbaceous layer that includes wetland plants, grasses, sedges, ferns, and mosses
- Swamp types include red maple sapling, willow and alder, high bush blueberry, and swamp azalea
Important Habitats in Connecticut

Freshwater Aquatic

• Include rivers, streams, lakes, and ponds

• There are 15,000 miles of rivers and streams and 6,000 lakes

• Key sub-habitats for wildlife include: large rivers and streams and their associated riparian zones, unrestricted free-flowing streams, and cold water streams
THE UNIVERSITY OF CONNECTICUT
CAMPUS OPPORTUNITIES
UConn Master Plan Principles

Broad Planning Guidelines

- Provide a development density of 30-35% FAR for technology research
- Preserve prime farmland (47 acres must be maintained as an agricultural preserve), wetland areas, and as much of the wooded rolling landscape as possible
- Minimize impacts to the prime farm soils
- Maximize synergistic relationship with the Academic Core, especially for uses within a 15-20 minute walk of its center
- Utilize on-site stormwater detention/sedimentation basins at natural low points and utilize vegetated swales to convey runoff
- Implement pedestrian and bicycle corridors for wooded areas, agriculture campus, residential, recreation area and campus
- Minimize development impacts to trees and topography through sensitive and creative site design

Planning Goals

- Establish a clear organizational concept
- Develop an articulated hierarchy of spaces and paths
- Create a humane campus in scale, function & materials
- Provide a flexible framework to accommodate future university needs
- Articulate a plan of conservation & development

Planning Principles

- Respect what is already in place
- All campus elements must inter-relate
- Campus is about people, not just buildings and spaces

The town of Mansfield favors new development that doesn't compromise the authentic character of this rural town.
UConn Campus Opportunities

The University of Connecticut in Storrs has 4 campuses:

1. Central Campus- main campus center
2. Depot Campus
3. Agricultural Campus
4. North Campus- future home of UConn Tech Park
At 233 acres, the North Campus is larger than the Central Campus
Storrs Campus Open Space

The Central Campus at Storrs contains the range of open spaces typically found at major universities as well as other unique spaces. From formal quads to more intimate courtyards, farmlands and long walks, these open spaces are the lifeblood of the campus.
Campus Uses

- Residences
- Arts/Culture
- Dining
- Academic/Teaching
- Sciences/Research
- Parking
- Sports/Recreation
- Student Services
Campus Uses: Science Core

- Pharmacy/Biology
- Institute of Materials Science
- Science Core
- Life Science
- Physics
- Mathematics/UTIS
- Institute of Mathematics and Physics
- Institute of Materials Science
- Institute of Environmental Sciences
- Institute of Materials Science
- Institute of Greenhouse
- Institute of Biotechnology
- Institute of Environmental Engineering
- Institute of Civil Engineering
- Institute of Biomedical Engineering
- Institute of Chemical, Materials, and Biomolecular Engineering
- Institute of Future Engineering
- Institute of Pathology
- Institute of Chemistry
- Institute of Physics
- Institute of Ecology
- Institute of Evolutionary Biology
- Institute of Greenhouses
- Institute of Biomedical Engineering
- Institute of Civil Engineering
- Institute of Environmental Engineering
- Institute of Future Engineering
- Institute of Pathology
- Institute of Chemistry
- Institute of Physics
- Institute of Ecology
- Institute of Evolutionary Biology
- Institute of Greenhouses
- Institute of Biomedical Engineering
- Institute of Civil Engineering
- Institute of Environmental Engineering
- Institute of Future Engineering
- Institute of Pathology
- Institute of Chemistry
- Institute of Physics
- Institute of Ecology
- Institute of Evolutionary Biology
- Institute of Greenhouses
- Institute of Biomedical Engineering
- Institute of Civil Engineering
- Institute of Environmental Engineering
- Institute of Future Engineering
- Institute of Pathology
- Institute of Chemistry
- Institute of Physics
- Institute of Ecology
- Institute of Evolutionary Biology
- Institute of Greenhouses
- Institute of Biomedical Engineering
- Institute of Civil Engineering
- Institute of Environmental Engineering
- Institute of Future Engineering
- Institute of Pathology
- Institute of Chemistry
- Institute of Physics
- Institute of Ecology
- Institute of Evolutionary Biology
- Institute of Greenhouses
- Institute of Biomedical Engineering
Circulation Network - Bikeways

- Existing Bikeways/Walkways
- Proposed Bikeways/Walkways
- Requested Bikeways/Walkways

(Town of Mansfield Planning Map)
Circulation Network- Bus

The existing Campus bus network presently serves the Charter Oak apartments in the North Campus. The campus will also be linked to regional transit and the town through the future Storrs transportation center.
Campus Formal Open Space

Major Formal Spaces

• The Forum- the heart of the campus as well as the “academic crossroads”

• Main Quadrangle- the most significant open space, the center of the campus, used for large ceremonial events and graduations.

• Fairfield Mall- a linear pedestrian corridor

• The Academic Way- several smaller, more intimate open space plazas which serve to strengthen connections to the southern portion of Central Campus
Campus Informal Open Space

Major Informal Spaces

- Swan Lake- a focal point within a historical landscape and naturally occurring water body

- Mirror Lake- a picturesque area of campus with a large canopy of trees and conifers as well as view corridors to the lake

- The Great Lawn- an open lawn for large gatherings and the public face of the University as well as the home to the Historic Wilber Cross building

- Lower Park- a generous open space and informal natural park with an arboretum containing a wide variety of specimen plants
Campus “Places”- Identity

From the Wilbur Cross Building to the Gampel Pavilion, Mirror Lake and the Forum, the Central Campus has buildings and open spaces with strong identity. The Tech Park will build on this tradition.
Campus “Places”- Connectivity

The campus’s network of paths, roads and open spaces serve as the connective tissue that holds it together.
Campus “Places” - Community

Fostering a sense of community is a primary objective of the Tech Park.
Campus “Places”- Research Environments

Places for science and research on campus should be as inspiring as the science itself. The UConn Innovation Partnership Building will translate similar notions of both “campus” and “place” to bridge diverse disciplines and spark innovation outside of the laboratory.
From NCAA Division I sports to a casual game of frisbee, the Storr’s campus is also a place of play.
Campus “Places”- Learn
From lecture halls to laboratories and outdoor classrooms.
University of Connecticut 21st Century Master Plan

At the Central Campus in Storrs, UConn 2000 projects have combined aesthetics with 21st century innovation, creating new and revitalized spaces and facilities. The physical metamorphosis of the campus has become a source of pride, boosting student and faculty recruiting, spurring alumni involvement, and enlivening academic research, teaching, and scholarship.
NORTH CAMPUS
UConn North Campus Site

The University of Connecticut proposes to develop a Research and Technology Park on the North Campus section of its main campus in Mansfield, Connecticut. According to the Outlying Parcels Master Plan (2000, JLR), “The North Campus consists of 333 rolling, forested acres. The site’s natural features consist of largely mature hardwood forest, rolling topography, stream corridors, wetland acres and prime farmland. Many of the (UConn) planning recommendations are geared specifically at preserving as much woodland, wetlands, streams, steep slopes and prime farmlands as possible” The North Campus includes a significant forest corridor to the north of the academic campus and provides a forested backdrop for the academic campus. The natural systems function to provide ecological benefits, stormwater filtration, biofiltration, breeding and foraging habitat for native wildlife.

A significant part of North Campus was farmed into the 20th century. Stone rubble walls that marked the edges of farmer’s land parcels crisscross the forest floor and the rusted remnants of farm vehicles remain on one old parcel in the North Campus. With the exception of some large trees near these rock walls and streams, most trees are of smaller caliper. The site is managed for lumber by the UConn Forest Management Committee.

Land Cover

Within the wetland and upland hardwood forest, the predominant canopy trees include black, red and white oaks; and shagbark and pignut hickory. Red maples and oaks dominated the canopy in the wetland forest. Less-prominent forest canopy trees include ash, beech, hemlock, and wild black cherry. Predominant ground covers include hay-scented, Christmas and cinnamon ferns and a variety of sedges that are dominant in the wetland forests. Less-prominent ground covers include jack-in-the-pulpit, trillium, mosses and club mosses. Skunk cabbage is also found in the wetlands. Because of a large population of whitetail deer, the shrub or understory forest layer has been heavily browsed, leaving only a few native spicebush and maple-leaf viburnum and thicker stands of invasive Japanese barberry. A successional old-field ecosystem occupies the northernmost part of North Campus between the forest edge and mown lawns along U.S. Route 44. Predominant species in the old field include white pine, Russian olive (exotic invasive), blackhaw viburnum, red cedar and native grasses.

A field on the east side of North Campus is managed as farmland. Trees along the edge of the farm field have low branches and foliage cover because of the increased exposure to sunlight. Exotic species like Japanese barberry have invaded the forest edge where sunlight and weed seeds have gained access to the forest floor.
North Campus Natural Features

- Natural Stone Walls
- Farmland
- Forested Areas
- Wetlands
Development of a Campus

Developable Sites

- Total Parcel Area: 110.6 acres
- Total Development Area: 900,000 GSF
- Total Parking Estimated: 2,970 spaces (at 3.3 spaces per 1000 sq ft)
Site Characteristics: A

Size:
- 28.2 acres
- 1,228,391 sf

Developable Area:
- None – Slated for Conservation

Distance from intersection of North Hillside Road (Hwy 430):
+/- 24 MIN WALK, 6,185 ft

Characteristics:
- Wooded site along drainage corridor
- Secluded
- Slated as conservation easement
Site Characteristics: B

Size:
- 25.3 acres
- 1,102,628 sf

Developable area:
- 16.27 acres
- 708,812 sf

Distance from intersection of North Hillside Road (Hwy 430):
- +/- 19 MIIN WALK, 5050 ft

Characteristics:
- Wooded site
- Relatively flat
- Potential gateway from 195
Site Characteristics: C*

Size:
- 21.8 acres
- 949,755 sf

Developable area:
- 12.88 acres
- 561,400 sf

Distance from intersection of North Hillside Road (Hwy 430):
+/- 15 MIN WALK, 3,800 ft

Characteristics:
- Wooded site
- Moderate topography
- Views to the south west
- Wetlands on 3 sides
- Accessible by existing campus road

*Recommended for Phase I IPB Building Site
Developable area within parcel

Parcel Area

Size:
- 14.7 acres
- 641,191 sf

Developable area:
- 11.415 acres
- 497,270 sf

Distance from intersection of North Hillside Road (Hwy 430):
- +/- 15 MIN WALK, 3,800 ft

Characteristics:
- Wooded site
- Moderate topography
- Views to the south west
- Wetlands to north east
- Accessible by existing campus road
- Adjacency to existing residential
Site Characteristics: E

Size:
- 18.34 acres
- 799,291 sf

Developable area:
- 10.05 acres
- 437,780 sf

Developable area with removal of tennis courts:
- 12.29 acres
- 535,618 sf

Distance from intersection of North Hillside Road (Hwy 430):
- +/- 1 MILE WALK, 2,850 ft

Characteristics:
- Wooded site
- Moderate topography
- Views to south west
- Bordered by retired landfill to southwest
- Accessible by existing campus road
Site Characteristics: G

Size:
- 5.74 acres
- 250,203 sq ft

Developable area:
- 2.6 acres
- 114,008

Developable area with removal of tennis courts:
- 5.74 acres
- 250,203 sq ft

Distance from intersection of North Hillside Road (Hwy 430):
- +/- 8 MIN WALK, 2,100 ft

Characteristics:
- Mostly wooded
- Bordered by retired landfill to the southwest
- Accessible by existing campus road

Existing structures:
- Tennis courts
Site Characteristics: H

Size:
- 48.2 acres
- 2,102,953 sf

Developable area:
- 48.2 acres
- 2,102,953 sf

Remaining developable area:
(Approximate area of site not occupied by Charter Oak Apartments)
- 30.89 acres
- 1,345,827

Distance from intersection of North Hillside Road (Hwy 430):
- +/- 7 MIN WALK, 7150 ft

Characteristics:
- Wooded site
- Moderate to severe topography
- Partly developed as campus residential
- Prime adjacency to campus

Existing structures:
- Housing
Site Characteristics: J

Size:
- 18.87 acres
- 822,182 sf

Developable area:
- 3.71 acres
- 161,925 sf

Distance from intersection of North Hillside Road (Hwy 430):
- +/- 19 MI IN WALK, 5,050 ft

Characteristics:
- Wooded site
- Moderate topography
- Floodplains and prime farmland
- Substantial wetlands limit developable area
Programmatic Constraints

Developable Area

- Vibration sensitive equipment requires setbacks from major roads
- The most sensitive equipment can require up to 295' setbacks
Phase I Site Selection

Centrally located in the North Campus, Parcel C has been selected for the Phase I Innovation Partnership Building. The site has approximately 13 developable acres with wetlands on three sides. The depth of the parcel affords vibration isolation for the sensitive Imaging and Clean Room facilities.
VISION:
CREATING A COMMUNITY
OF INNOVATION
Vision- Creating a Community of Innovation

The vision for the Tech Park at UConn is that of a “community of innovation.” This vision will be supported by a master plan strategy that seeks to leverage the creativity and energy of a critical mass of scientists, researchers, industry leaders and students. The plan focuses on optimizing connectivity, synergies and chance encounters in a vibrant and interactive environment. This collaborative and interactive spirit will help the Tech Park serve as a bridge between:

- The Town and University
- The University and Industry
- Research Development Advances and Commercial Products
- Industry Partnerships and Manufacturing Innovation
- Materials Discovery, Product Design & Development and Advanced Manufacturing
- Economic Development and Global Competitiveness

The ability to create the community of innovation for the UConn Tech Park is reliant upon four primary factors:

- Place/Facilities
- People
- Interaction and Collaboration
- Flexibility

Place/Facilities - Within walking distance of UConn’s Central Campus Technology Core, the Tech Park offers proximity and partnership with a leading University. The Tech Park itself is set within a 300 acre environment with great natural beauty. From farmland to forest and wetlands this setting with its views to distant hilltops is a great asset. The Phase 1 Innovation Partnership Building will provide the site with highly sought after core facilities to serve as a strong foundation for the Tech Park and a magnet for the 800 companies that are aligned with the foci of the Park and within a two-hour drive. The High Performance Imaging, Clean Room, High Bay Advanced Materials & Manufacturing and Tenant lab space of the IPB will make it a first-class facility supporting the work of regional leaders in innovation.

Amenities - Opportunity for Tech Park researchers, students and employees of the Tech Park to move beyond the bounds of the university to connect to the community. Other close by amenities include Storrs Center, Mansfield Community Center and extensive open spaces and preserves/trail networks.

People - The Tech Park’s answer to “People” begins with its “Place.” Located adjacent to UConn’s Central Campus, faculty and students of the University will be an important resource and instrumental in the success and vitality of the facility. The University’s researchers and students will work side by side with industry partners to serve as part of the creative and intellectual base upon which the Tech Park will grow.

From start-up companies renting a single bench to Fortune 500 companies, the Park will be a magnet pulling from all corners of the region. Whether it’s access to sophisticated specialty core facilities, the connectivity with a premier University- its students and faculty, or
simply being a part of the dynamic community of thinkers and makers, the Park will draw the best and brightest to this bucolic setting at the edge of Uconn’s Central Campus.

**Interaction and Collaboration** – While these first two factors make use of UConn’s and the Tech Park’s natural assets, it is the Master Plan that will shape the opportunities for interaction and collaboration. By creating an integrated network of open spaces and ground floor amenity spaces that activate them, a framework for a vibrant sense of community is set. Recognizing the importance of these non-technology spaces in actually supporting the science and the users is an important aspect of the Master Plan. Encouraging interaction between the Tech Park users and the larger community will also contribute to its vitality.

**Flexibility** - The Tech Park’s success and pace of growth will also hinge on its ability to accommodate the needs of a wide range of “partners.” From a small company renting one bench to the major corporation seeking the opportunity to become an anchor tenant, the Park’s ability to satisfy diverse needs will amplify its growth and dynamism. Flexibility will extend beyond the type of users and science to also include accommodation for a range of development scenarios, making the UConn Tech Park a nimble, competitive and attractive center of innovation.
Engaging Campus Context

The buildings within the new Tech Park will respond to the Central Campus and Connecticut architectural features while at the same time creating a new and distinct architectural space.
Vibrant Heart of the Community

The Tech Park can serve as a bridge between the Town of Mansfield and UConn. Through various initiatives, the Tech Park can engage the larger community with social and educational events that shed light on the exciting work taking place there. There is also the potential for Tech Park facilities such as lecture or seminar rooms being made accessible for Mansfield community events.
Pedestrian Streets

Creating flexible, walkable, bikeable streets and pathways.
Campus Walk

Experiential Long Walks will connect the development clusters weaving in and out of the natural treeline and engaging courtyards and more formal quads.
Extending Collaboration into the Campus

Loggias, arcades and courtyards will provide outdoor interaction and classroom opportunities.
Opportunities for Interaction
Cafes, lounges, lobbies and outdoor spaces will provide opportunities for spontaneous and informal interaction.
Fostering a Research Collaboratory

The diversity of science and technology employed at the Tech Park will provide the opportunity for exciting collaborations.
Flexible Space for Research

Planning agile, flexible research laboratories supporting “spin in” and “spin out” partnerships will promote interchangeability of research groups, processes, and laboratory setups.
High Tech Connectivity

From the bucolic setting of the North Campus, industry partners will be able to stay connected whether to their main office or with clients and institutions across the globe.
Accelerating Discovery

Providing research environments that help attract industry partners, and enhance productivity through ergonomic systems furniture, task lighting at the bench, and access to natural light.
Libraries

A shared resource and quiet respite
On-site cafes will provide a convenient opportunity for sharing a meal or cup of coffee and informal interaction with colleagues.
Residential

The opportunity to live in proximity to the Tech Park provides not only convenience but a greater sense of community.
Recreation

The convenience of on-site recreation will support a model of “live, work, play”
Transparency & Visibility

Visual connections to the outdoors will exploit one of the Tech Park’s most important assets— the beauty and seasonal changes of its natural setting.
A First of Its Kind Community

At the North Campus, UConn has the opportunity to transcend the model of the generic tech park and redefine the typology.
What Makes a Campus: Space vs. Object

The character of a campus is defined by both its buildings and the open spaces they shape.

Space: Salk Institute

Object: Air Force Academy
What Makes a Campus: Campus vs. Suburban Tech Park

Campuses typically enjoy a vibrancy generated by the activation and interaction of ground floor program and the network of open spaces. Conversely, Suburban Office/Tech Parks typically lack meaningful open space and parking strategies.
North Campus Landscape Application

Value of Existing Landscape and Natural Assets

• Integrate value into site development strategies

• Maintain and restore important ecological function

• Minimize the impact of traditional site infrastructure requirements

• Promote North Campus as a “living lab”

• Preserve landscape/eco-system beyond construction

• Stratify disturbed edges and engage mitigation technologies

• Create abstracted landscapes based on dominant forest, field and farm typologies

• Abstracted created landscapes contrasting undisturbed landscapes
Master Plan Guiding Principles

• Establish a clear organizational concept
• Develop an articulated hierarchy of spaces and paths
• Create a humane campus in scale, function and materials
• Provide a flexible framework to accommodate future university needs
• Articulate a plan of conservation and development
• Create a bridge between the Tech Park and the community of Mansfield
ORGANIZING IDEAS
Organizing Ideas Introduction

The organization of the North Campus begins with the site’s natural landscape and the road that runs through it - connecting at either end to the Central Campus and the Town of Mansfield. The building parcels, as defined in the Fuss + O’Neil master plan, are irregularly-shaped and bounded between North Hillside Road and the wetlands, which are prevalent throughout the site.

With the exception of the Charter Oak apartments, the master plan area is largely undeveloped woodlands. For this reason, a primary influence in creating organizing ideas for the site is North Hillside Road itself. The road winds through the rolling site, bisecting it and serving as a link between UConn’s Central Campus (to the South) and the Town (to the North). More than being the Tech Park’s “main street,” North Hillside Road will be an important new entry front door for UConn’s Central Campus. At the time of this report, the roadwork has not yet reached its northern terminus, yet its importance as an organizing and linking element has been firmly established.

The intersections of North Hillside Road with North Eagleville Road (to the South) and Route 44 (to the North) represent potential gateways and the opportunity for the Tech Park to create a new “bridge” between UConn and the Town of Mansfield.

In response to the Master Plan Goals and Objectives, three organizing ideas were developed, discussed and evaluated. Each of these ideas addressed issues of open space, density, circulation, gateway and flexibility in different ways. In the end, the best attributes of each option were combined to form the organizing ideas for the Master Plan.

An articulated hierarchy of nodes and ways provide distinct spatial experiences within the larger landscape framework and provide destinations along a path. Nodes include gateways, thresholds, quads, preserved landscape areas and parking lots; ways include North Hillside Road, walkways, trails and service lanes. The manner in which nodes and ways are expressed through their scale, degree of enclosure and materiality set the tone and rhythm for the campus. Landscape guidelines for the Tech Park gateways, quads, parking lots, roads, paths and trails are presented in the following sections of this master plan.
Over the course of the Master Plan process, a number of organizational ideas were studied, presented and evaluated. In contrast to the existing North Campus Plan by Fuss and O’Neill, the objective was to create density that would support a sense of community. The three main ideas can be summarized as follows:

- **Linear** – Organized the program along the west side of North Hillside Road with a network of small to medium-sized open spaces. Potential future development would stretch out towards the Central Campus and Rt.44.

- **Multiple Clusters** – Organized the program into three distinct clusters or “nodes.” Each cluster of buildings built around a central open space and potentially themed to foster natural synergies.

- **Centralized** – This option, the most compact, organized the entire program around a large central open space.

Ultimately, these three ideas were distilled into a single idea– utilizing the best attributes of each.
Campus Thresholds

The Tech Park will bridge the Town and University, creating important development opportunities at the points of interface.

North Gateway

The North Gateway represents the opportunity for the Tech Park to create a new bridge between UConn and the Town of Mansfield at the intersection of the North Hillside Road Extension with county route 44. As a main entry to the tech park and a threshold to the campus, this gateway will serve as prologue to the campus, which lies beyond the Red Swamp preserve. Creating a threshold that uses traditional local materials set in contrast to modern manufactured items in striking new ways to welcome visitors to the tech park.
North Hillside Road Extension

Strengthen North Hillside Road as important connective landscape

Campus Crossroads
The gateway to the tech park at the intersection of North Hillside Road and Eagleville Road (Hwy 340) represents the opportunity to create a more pedestrian, friendly, humanely scaled campus threshold. Wide turns, asphalt sidewalks adjacent to roads, large buildings with little relationship to the pedestrian system and the campus facilities compound on the northwest side of this intersection can be incrementally improved through the introduction of storm water tree lawns that separate pedestrians from traffic, curb extensions, and the introduction of buildings with retail and gathering spaces facing sidewalks.
Wetlands & Creeks

- Majority are located in Red Maple Swamp preserve and ‘behind’ building and parking nodes

- Green corridors to be located where wetland and creek network cross North Hillside Road

- Secure additional plans and funding for vegetative restoration of wetland and creeks disturbed by the construction of North Hillside Road

- Study effect of development on the fragmentation of wetland and creek network

- Utilize best practices for restoration

- Re-vegetate disturbed edges of wetlands and creeks with native and adapted plants using a variety of planting schemes derived from research based studies

- Preserve and interpret rock walls and man-made berms as evidence of past land; extend walls to forge connection between new tech campus landscape and agricultural relics
Wetland Forest

- 60 acres of Red Maple Swamp preserved
- Largest contiguous preserved parcel on North Campus
- Document condition of preserve flora, fauna and soils prior to construction
- Protect buffer beyond edge of preserved area during road and building construction
- Preserve and interpret rock walls and farm equipment as evidence of past land use
- Maximize views into preserved area
- Interpret functioning systems occurring within wetland
- Document effect of new development on preserve
Existing Trail Network
Farmland

- Clarify existing farmland as a distinct landscape
- Review chemical usage with regard to air intake and user health
- Incorporate agricultural system into campus
- Preserve and interpret rock walls and man-made berms as evidence of past land; extend walls to forge connection between new tech campus landscape and agricultural relics
Neighborhood Quads

NEIGHBORHOOD QUADS
“Passages”- Green Corridors

- Serve to bridge the divide between preserved landscape fragments on the east and west side of North Hillside Road
- Restore continuous drainage patterns and provide path for animal movement
- Provide ecological services including storm water management
- Establish a visual rhythm along the road and trails as green, shaded counterpoints to architectural nodes
- Provide landscape framework for North Campus
- The Landscape Quads reflect the distinctive program and architectural style of each node
- The landscape framework, North Hillside Road, public walkways and trail systems provide a unifying framework that is informed by the UConn Landscape Master Plan
- Quads serve as counterpoint to and precursor to surrounding landscape framework
- Articulate clear hierarchy of space defining transition from public roadway to tenant entries
Existing Vehicular Circulation

Primary Vehicular Circulation

RT 44
RT 195
NORTH HILLSIDE RD.
NORTH EAGLEVILLE RD.
Connections to Route 44 and 195 will provide greater accessibility and development flexibility for certain parcels.
Existing Pedestrian Circulation
Expanded Pedestrian Circulation

Ease of walkability to and from the Central Campus renders the Southern-most parcels most desirable for partners keen on University interface. Expanding the existing pedestrian network will create a cohesive and walkable campus-like Tech Park.
Topography

The rolling topography of the North Campus creates opportunities to integrate buildings into the natural landscape to mitigate their size.
Master Plan Intent

The UConn Tech Park Master Plan represents the culmination of this master planning effort. Research and analysis of the many factors that will shape and sustain the UConn Tech Park have been conducted and presented. Precedents have been studied and assessed and organizing ideas have been proposed and evaluated in a very collaborative manner. Derived from this holistic process, the result is a master plan that conveys a holistic vision.

The Tech Park will be a community of innovation that celebrates both technology as well as its natural setting. Its 900,000 sf program will be organized into three distinct “neighborhoods”:

- The Innovation Core Neighborhood
- The Energy Research Neighborhood
- The Industry Partner Tech/Research Neighborhood

Neighborhood Strategy - Each neighborhood is arranged around a central green space and connected and unified by a pedestrian and vehicular network that winds through the North Campus. This approach creates clusters of density that will support a sense of community and lead to interaction and collaboration that will make the Tech Park a vibrant and exciting place to be. The pattern of neighborhoods also suggests two important future development clusters - one at intersection of North Eagleville Road and the other at Route 44. Although outside the scope boundary of this effort, these two neighborhoods would create true campus gateways and fully engage the Central Campus and Mansfield, completing the vision for the North Campus. These connections will be achieved using HUD Livability Principles in order to maintain a sustainable development between the town and the university.

Open Space Strategy – The goal of creating density is driven in part by a desire to minimize impact on the natural landscape of the North Campus. By creating clusters of development, large areas of the site remain undisturbed and green corridors still connect across it. In addition to these large expansive areas of undisturbed woodlands, wetlands and farmlands, the open space network is also composed of long experiential pedestrian walks, formal quads and smaller, less formal courtyards.

Circulation Strategy - North Hillside Road is the main conduit through the Tech Park. Accommodating vehicular, pedestrian and bicycle traffic, it provides primary access to all building parcels. Pedestrian paths wind through the woods and farmland for an alternate path of travel. The future connection to 195 will enhance the access to The Industry Partner Tech/Research Neighborhood.

Service Strategy – Service access to the Tech Park will originate on North Hillside Road but peel off onto discreet service drives, removed from main building entries and open green spaces.

Parking Strategy - The approach to parking indicated in the Master Plan relies largely on surface lots. While it is clear that structured parking would greatly reduce the impact to the site, it is uncertain at this time, if developer cost models would support structured parking. In order to better position the Tech Park’s economic competitiveness, a more cost-effective solution is indicated here.

Development Strategy – The Master Plan is organized to allow for multiple development scenarios. This flexibility is designed to accommodate a wide range of industry partners, entrepreneurs and developers with different needs and business plans. In addition, size of parcels and floor plates will accommodate a wide spectrum of science and technology uses.
Master Plan Strategy

By organizing the Tech Park's development area into three distinct nodes, these clusters of community are discovered sequentially along an experiential “country road”. This organization suggests a thematic linking of the buildings that compose each node as well as future nodes at the interface with the Central Campus and Town of Mansfield.
Pedestrian Circulation

The Pedestrian Circulation network is designed to offer Tech Park users 2 choices: a direct path along North Hillside Road or a more meandering and varied experience- engaging woodlands, quads and farmlands along the way.
Neighborhood Quads

Each Tech Neighborhood is organized around a central quad. Through their relationship with North Hillside Road and the natural context of the North Campus, these three open spaces will communicate a sense of arrival, place and community.
Building Access

Primary Building access is designed to be easily recognized from primary vehicular and pedestrian circulation. Service access is located to be discrete and removed from the main entries and open spaces.
Innovation Core Neighborhood

This neighborhood is centrally located within the North Campus. It will feature the Phase I Innovation Partnership Building (left) which will house highly specialized core facilities and equipment. It’s recommended that Parcel D will be the future site of a similar “core” facility. The two buildings would face each other in a formal way, creating a central green space at the heart of the campus. Terraced and landscaped parking is provided.
Energy Research Neighborhood

Located at the southern portion of the North Campus, the Energy Research Neighborhood enjoys a close proximity to the Central Campus. These primary building parcels are organized in a linear fashion along North Hillside Road. An expansive green space is shaped between the buildings at the road. Structural parking is located across North Hillside Road.
Industry Partner Tech/Research Neighborhood

Located at the Northeast portion of the campus, the Industry Partner Tech/Research Neighborhood is comprised of 3 building sites organized around a central green space. The site provides access from 195 as well as North Hillside Road making the site particularly flexible. The landscaped parking areas are located to be out of sight from the central green.
DEVELOPMENT STRATEGY
Intent

Conversations with a wide spectrum of potential tenants indicate that the Master Plan should provide for a range of development scenarios. At the present time, the Phase 1 Innovation Partnership Building is the only building within the Tech Park that is planned to be built by UConn. Future buildings are envisioned as being built by developers and private companies and to accommodate and encourage this future development, the Master Plan provides a wide variety of opportunities. Multiple building sites located within three different clusters of development offer a range of parcel sizes and varying proximity to the Main Campus and Town. Some parcels offer direct access to Route 195. The result is a Tech Park that is unified and cohesive yet allows room for the various needs of potential partners.

Best Research Use Per Parcel

Based on preliminary concepts for the research focus areas projected for the UConn Tech Park, a corresponding “Best Research Use Per Parcel” has been developed to best locate each of the uses based on interference, adjacencies, and site conditions. An in-depth site analysis, of each of the developable parcels has located the Phase I Innovation Partnership Building, at the core of the North Campus. A future phase or expansion of this facility would concentrate compatible research themes, specialty core labs and tools within a central “core” or district of the North Campus.

To the north, Industry Partners with research in the areas of fabrication and sensitive tools and “stand-alone” facilities will benefit from direct access and visibility from Route 195. To the southwest, the Fuel Cell Core and Industry R&D with research in the areas of Energy & Fuel Cells will be located to the west of North Hillside Road, sited on the narrower sites with immediate adjacency to Connecticut Light & Power right of way for transmission lines – which limit more sensitive tools located in the Innovation Core district. To the southeast, a future development site has been identified for long-term redevelopment for Industry Sensor in the areas of Bio/Agricultural Tools. On either extremes of North Hillside Road, future long-term development sites have been identified. On the north, development sites for commercial uses at the intersection of North Hillside Road and Route 44, and opposingly on the south, development sites to maximize future long-term academic and campus growth, which will assist in bridging the sciences from the Technology Neighborhood into the North Campus.
Best Research Use Per Parcel
Tech Park Uses

The UConn Tech Park Master Plan recognizes that elements which will define later phases of the UConn Tech Park Master Plan are subject to change over time. The Master Plan approach outlines a program framework that is able to respond to changing markets and financing in order to be sustained as an overall development. The Plan proposes three conceptual full-build out scenarios for the Tech Park at 900,000 GSF, the total developable area for the North Campus. Each diagram proposes a different projection of use based on three development scenarios.

Tech Park Use Scenarios

<table>
<thead>
<tr>
<th></th>
<th>SCIENCE &amp; TECHNOLOGY</th>
<th>AMENITIES</th>
<th>RETAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECHNOLOGY</td>
<td>850,000</td>
<td>25,000</td>
<td>25,000</td>
</tr>
<tr>
<td>TECHNOLOGY / ACADEMIC</td>
<td>780,000</td>
<td>25,000</td>
<td>25,000</td>
</tr>
<tr>
<td>TECHNOLOGY / MIXED-USE</td>
<td>580,000</td>
<td>200,000</td>
<td>70,000</td>
</tr>
</tbody>
</table>

900,000 SF
In a similar way, the Science & Technology uses within the Tech Park are subject to change over time, and equally as informed by the business model for the Tech Park. The Plan proposes three conceptual Science & Technology distributions of program based on benchmarking and analysis of several new Tech Parks across the country. Each breakdown of program is based on the previous scenarios of development - projecting a benchmarked square footage of research focus per Science & Technology scenario.
Connective Tissue

- Allow outdoor places for education and recreation as the connective tissue between development nodes
In addition to the three Tech Park Neighborhoods proposed here, exciting opportunities present themselves at the junctions with Route 44 and North Eagleville Road. These important points of interface with the Town and Central Campus present “gateway opportunities” with new neighbors programmed to optimize their campus edge location.
## Comparative Matrices

Part of the collaborative effort of the Master Planning Committee resulted in two comparative matrices. A matrix was created to evaluate and compare the various North Campus parcels as well as to judge the three organizational options for the Tech Park Master Plan. Both the criteria and the actual input were the result of collaboration and reflect the perspectives of a range of stakeholders and experts.

### Organizational Option Matrix

This matrix explores various issues that fall under four major categories:
- Tech Park Program and Mission
- Environmental/Open Space
- Access/Infrastructure
- Compatibility/Integration with University and Town

Each of the organizational ideas: Spine, Nodes and Loop were judged both for their success in addressing each category in the first phase (when only the IPB will be built) as well as in the ultimate build-out of the 900,000sf. This analysis led, in part, to the decision to create a fourth option that combined the best attributes of the original three.

### ORGANIZATIONAL OPTION MATRIX

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>OPTION 1: SPINE</th>
<th>OPTION 2: NODES</th>
<th>OPTION 3: LOOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH PARK PROGRAM &amp; MISSION</td>
<td>PHASE I FULL BUILD</td>
<td>PHASE I FULL BUILD</td>
<td>PHASE I FULL BUILD</td>
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<tr>
<td>1. Establishes a clear organizational concept</td>
<td>14</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>2. Provides a flexible framework for future university needs</td>
<td>13</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>3. Accommodates logistics of future phasing</td>
<td>16</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>4. Creates a strong sense of place</td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>5. Creates a new campus center</td>
<td>5</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>ENVIRONMENTAL/OPEN SPACE</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Optimizes long views</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7. Develops an articulated hierarchy of spaces and paths</td>
<td>4</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>8. Balances conservation and development</td>
<td>13</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>9. Enhances ecological value of undeveloped areas</td>
<td>14</td>
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<tr>
<td>ACCESS/INFRASTRUCTURE</td>
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<tr>
<td>10. Suggests an efficient infrastructure strategy (especially for adequate water supply)</td>
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<td>11. Provides a vibration free location for Phase 1 Core Labs</td>
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<td>12. Provides a viable parking strategy</td>
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<tr>
<td>13. Minimizes impact to existing structures</td>
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<tr>
<td>14. Employs a strategy to engage the town of Mansfield</td>
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<td>7</td>
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<tr>
<td>15. Provides a new campus gateway</td>
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<tr>
<td>16. Easily walkable from/to campus core</td>
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<tr>
<td>17. Supports aim of North Hillside Rd as a main entry/exit for high traffic campus events</td>
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<td>1.78</td>
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</table>

This matrix combines both qualitative and quantitative criteria to explore the highest best use for the parcels of the North Campus. From issues such as Parcel Size, Adjacencies and Ability to Accommodate Sensitive Equipment, this matrix was important in developing the “Best Research Use per Parcel” recommendations.
The North Hillside Road Experience

Upon its completion and connection to Route 44, North Hillside Road will not only be the UConn Tech Park’s “Main Street,” it will establish a new front door for the Tech Park and UConn’s Central Campus. Recognizing the importance of this new northern gateway and the first impression that North Hillside Road will provide for so many, the road must be viewed in a broader context and its true significance understood. As the University of Connecticut seeks to further bolster its standing and reputation and the new Tech Park looks to establish its own, the North Hillside Road experience will be central in shaping a vision that is memorable, evocative and unique.

The Master Plan is organized as three distinct development clusters set along the road and within a field of nature. In order to achieve the clarity and impact of that vision and understand and appreciate the rhythm of sequentially moving through these two different types of space, the edges between the two must be clearly articulated.

With plans for the first Tech Park building and preliminary discussions with potential industry partners underway, it is essential to establish the following goals to ensure that the North Hillside Road experience is one that elevates an appreciation of the area’s natural beauty and strengthens the image of the Tech Park and Storrs Campus as a whole:

- Maximize the contrast between the development clusters and the natural fabric that connects them by maintaining/restoring the character of those natural areas.
- Minimize the visual impact of parking along North Hillside Road through distance, screening and terracing.
- Optimize the view corridors to specific natural assets such as farmland, wetland and distant hilltops.
- Articulate building massing to minimize bulk and frame views - particularly for those building sites nearest North Hillside Road.

It is acknowledged that due to the irregular configuration of building parcels, site topography, the impact of wetland setbacks and program requirements such as vibration isolation, that each parcel and building will pose its own set of unique challenges in terms of achieving these goals. Nonetheless, in order to leverage the natural assets of the North Campus and create a Tech Park that defies preconceptions and elevates the typology to a higher level, the importance of the road experience should not be underestimated. All reasonable efforts should be made to achieve these goals in order to realize the Master Plan vision.
1. Establish new campus gateway and future development to optimize synergies with the town of Mansfield
2. Preserve meadow open space for landscape variety
3. Preserve Forests and Wetlands
4. Maintain open views to farmland and frame with campus development
5. Preserve forested areas on both sides of North Hillside Road and provide views to farmland
6. Establish a building-defined quad centered on North Hillside Road. Buildings on the West side of the road should be raised to afford views to the surrounding landscape
7. Preserve green space with views to the West. Parking at grade should be terraced to place cars out of sight
8. Establish a building-defined linear open space along North Hillside Road. Buildings should be adequately spaced to allow views through to the landscape
9. Preserve forested hillside
10. Maintain views to the south to provide sense of arrival to the Central Campus
11. Establish new campus gateway and future development to optimize synergies with central campus
Maintaining the Road Experience

Sections A through F illustrate a variety of conditions along North Hillside Road. These indicative sections demonstrate strategies to minimize views of parking lots that are placed along the road in order to maintain the landscape experience of North Hillside Road.
SECTION A

• The construction/extension of North Hillside Road impacts a swath of approximately 150' wide

• Restoring this zone with native vegetation is critical in realizing the Master Plan vision
SECTIONS B AND C

• Employ berming and planting to obscure parking lots from pedestrian and vehicular traffic along North Hillside Road

• Parking structures should be partially embedded into sloping topography

• Provide planting strips for trees and greenery between parking rows
SECTIONS D AND E

• Use sloping hillside to the West as an opportunity to terrace parking and remove cars from view for pedestrian and vehicular traffic along North Hillside Road

• Employ berming and planting to minimize views of cars to the East
SECTION F

- Structured parking should be terraced into the sloping hillside to the East
- Provide greenery and planting between the terraced levels
- The facades of the parking structure could include elements natural stone or be treated as a “green wall” - accommodating the growth of climbing plants
Screening and Framing: Controlling Lines of Sight

Section demonstrating effectiveness of berming and terracing to minimize views of parking while maintaining views to surrounding landscape.
Screening and Framing: Controlling Lines of Sight

Section demonstrating how long views of the surrounding landscape from the road can be preserved by raising portions of buildings.
Site Constraints

The Technology Park is not located within a floodplain, aquifer protection area, or areas with federally-listed threatened or endangered species, however, development may be affected by the following site constraints:

- **Land use** – In conjunction with the roadway project, the development of the will require mitigation for impacts to prime farmland and wetlands. These mitigation areas including conservation easements will be provided outside the development area. Direct impacts have been minimized for the development by implementing buffers from sensitive areas that have set the parcel boundaries.

- **Topography** – Slopes within the developable areas typically vary from 2% to 15% with the exception of portions of Parcel H with slopes as steep as 40%. It is likely that retaining walls will be required in order to meet existing grades at the parcel limits and existing roadways.

- **Geotechnical Conditions** – Based upon subsurface information for the proposed roadway, surficial soils within the project area are anticipated to be till/thick till overlying schist bedrock. Rock was encountered 7 to 17 feet below the existing grades and groundwater varied greatly between 0 to 13 feet below grade depending on the proximity to wetlands. Rock and groundwater conditions will influence the design of any basements and foundations.

- **North Hillside Road Extension** – The alignment of the new roadway will be a fixed condition throughout the development and will be critical to the layout and elevation of each parcel.

- **Traffic** – As the Technology Park is constructed in phases and ultimately towards the full build scenario, off-site improvements to the surrounding roadway network including signal timing modifications and geometric improvements are anticipated to be required. These improvements will need to consider the actual program breakdown of each facility as well as other developments within the project vicinity at that time.

- **Archaeological** – Based upon previous archeological assessments by UConn, development within several of the parcels contain potential areas of prehistoric and historic value. Additional archeological surveys will be required prior to development.
Regulatory/Approvals

Town Approvals
As a State agency, UConn is not subject to local permitting including zoning and wetlands. However, if the university decides to proceed with a development strategy that includes the sale of one or more parcels, those parcels may then be subject to applicable local zoning and permitting requirements. The portion of North Campus to be developed into the Technology Park is currently zoned RD/LI – Research and Development Limited Industrial by the Town of Mansfield. Permitted uses in this zone are consistent with the proposed program for the Technology Park.

Over the next three years, the Town of Mansfield will be updating its Plan of Conservation and Development and developing new zoning and subdivision regulations through a Community Challenge Planning Grant awarded by the Department of Housing and Urban Development. As part of that process, the Town will identify regulations to guide development of the park should it ever come under local jurisdiction. The University will continue to collaborate closely with the Town to ensure that future development of the north campus area is consistent with the master plan.

State Permits and Approvals
State and federal environmental permitting has been obtained for both the roadway project and the potential full build-out of the Technology Park as described in the Record of Decision. These permits establish design criteria and limits for building envelopes and total building area as well as the resulting impacts including, but not limited to, vehicle trip generation, parking ratios, water and sewer use volumes and storm water standards. Upon completing the design of an individual parcel, UConn will perform a Comparative Analysis to assess changes to the constraints or impacts previously approved.

Wetland and farmland mitigation is also included as part of the roadway project and potential full build-out of the Technology Park. Wetland mitigation will be provided for the entire project east of Parcel D. Impacted farmland will be mitigated offsite. No additional mitigation will be required if future development is within the limits identified in the Record of Decision.

Additional permitting is anticipated for the development of each parcel which may include but not be limited to:

- CEPA Comparative Evaluation
- DEEP Flood Management Certification
- DEEP Inland Wetland & Watercourse Permit
- DEEP Storm water and Dewatering Wastewaters from Construction Activities
- DEEP General Permit for the Discharge of Storm water Associated with Industrial Activities
- DEEP General Permit for the Discharge of Storm water Associated with Commercial Activities
- DEEP General Permit for Domestic Sewage
- Office of the State Traffic Administration (OSTA)
- Underground Storage Tank registration
- Air quality permitting
Infrastructure

The proposed North Hillside Road Extension will include the installation of the following utility services designed to support the full build-out of the North Campus:

Water
A 12 inch ductile iron water main with new fire hydrants will be provided within the new roadway for fire and domestic service. In addition, a 4 inch PVC reclaimed water supply pipe will be provided.

With regards to water supply, the North Campus development has been allotted 90,000 gallons per day (gpd) for the full build-out, excluding the existing uses such as the Charter Oak Apartments. This allotment was generally based upon industrial uses and as discussed within the Key Findings section, additional sources of water supply may be required in order to satisfy the full build out of the Technology Park.

UConn is not tied to a public water supply system and is supplied potable water from two well fields (Fenton River Wellfield and the Willimantic River Wellfield) with a total supply of approximately 3 million gallons per day (mgd). The University also has six water storage tanks with 8 million gallons of capacity. With an average daily demand of approximately 1.3 mgd and a peak demand of 2.2 mgd, the system generally operates with a margin of safety over 1.0 throughout the year. The exception would be during the early fall months where warm and dry weather reduces the supply while the return of students to campus increases demands. The University has implemented protocols for drought conditions in the event it is necessary to reduce consumption. Through water conservation programs, the University has also had demands steadily decrease since peaking in 1995.

The 2011 Water Supply Plan assesses options to increase the water supply in the system by approximately 1 mgd. Connecting to the Connecticut Water Company system in Tolland or the Willimantic Water Works system in Windham have been assessed, along with the possibility of adding wells at the existing wellfields or a new wellfield. UConn expects a regulatory decision by the fall of 2012 and any the design/permitting to be completed by 2015 for additional water supply. Another option being reviewed is a water main extension from MDC. This option could provide approximately 5 mgd but at a significant cost (in excess of $100 million).

UConn is also nearing the completion of a reclaimed water system with a capacity of 700,000 gpd which allows a reduction in potable water consumption at the central utility plant and as irrigation to offset the demands on potable water.

Wastewater
A gravity 12 inch sewer main that discharges to North Hillside Road is proposed within the road which includes 8 inch capped laterals for future parcel connections.

UConn manages their own wastewater treatment system, which serves both on and off-campus uses. The Water Pollution Control Facility operated by UConn has a design capacity of 3 mgd of average daily flow and 7 mgd for peak flow. Typical flows range between 1.5 and 2 mgd during the school year and 0.8 mgd during the summer months. According to the 2007 Water and Wastewater Master Plan, the WPCF operates annually at 41% of the design capacity for average daily flow and 90% of the design capacity for peak flow. Development on the North Campus has been allotted 1 mgd of average flow for the full build-out, consistent with the allotment of potable water. Similar to water usage, uses with significant discharge may require upgrades to the treatment facility or alternate sewage disposal methods.
Other Utilities
Additional utilities within the roadway include electric and telecommunications duct banks and a 6 inch gas line. While UConn provides heating and cooling for University buildings, the Tech Park will not be connected to the central utility plant.

Stormwater
Storm water quality and quantity control is a primary concern addressed in several UConn published documents, including the Sustainable Design Guidelines, Landscape Master plan and the Record of Decision for the North Hillside Road Extension.

The University has identified several preferred methods of reducing runoff including infiltration, permeable pavement, and roof rainwater collection. The Landscape Master plan indicates a preference towards detention and retention systems with smaller footprints distributed throughout the landscape instead of one large system. Aesthetics of storm water management systems are also of importance to the University and they should fit within the natural landscape.

HVAC
- Hot Water Heating Systems: Modular, Gas-Fired, Condensing Boilers, Sized to Provide N+1 Peak Capacity
- Steam Generating Systems: Gas-Fired, Low-Pressure Boilers, Each Sized to Provide 75% of Peak Capacity
- Primary Chilled Water Systems: Electric Centrifugal, Water Cooled Chillers, Sized to Provide N+1 Peak Capacity
- Low Temperature Chilled Water Systems: Electric Glycol Centrifugal, Water Cooled (via Primary Chilled Water) Chillers, Sized to Provide N+1 Peak Capacity
- Process Chilled Water Systems: Equipment Cooling via Primary Chilled Water and Plate and Frame Heat Exchangers, Sized to Provide N+1 Peak Capacity

Electrical
- Incoming Primary Service: Emanates from CL&P 15kV Distribution System
- Building Transformation: Pad Mounted Transformers Provided for Each Building/Phase by CL&P
- Secondary Main Switchgear: Single Ended Switchgear Lineups for Each Building/Phase
- Emergency Power Generation: Required Estimated Load of 4,500 kW

Plumbing
- Water Systems: Extension from Municipal Water Main
- Storm Drainage: Extension to Municipal Storm Sewer
- Laboratory Waste and Vent: pH Neutralization System discharges to Municipal Sewer
- Sanitary Waste and Vent: Extension to Municipal Sanitary Sewer
- Natural Gas: Extension of the Municipal Distribution System

Fire Protection
- Water Service: Extension from Municipal Water System with Backflow Preventor
Roadway Construction & Schedules

North Hillside Road Extension
Initially the construction of the new road, connecting the existing North Hillside Road to Middle Turnpike (Route 44), was a transportation-focused project to alleviate traffic from Route 195. The development of the Technology Park will be dependent on the construction of the North Hillside Road Extension. Based on the roadway’s history and approved environmental impacts, the geometry has been set and will dictate the access to the various parcels within the development with the exception of Parcel B which has also direct access to Route 195.

Since the road is state and federally funded, ConnDOT and FHWA will oversee the design and construction of the road. Semi-final (70%) Design Plans were submitted to the ConnDOT in April 2012. ConnDOT and UConn are targeting the roadway to be completed in the spring 2014. Due to the projected roadway schedule, it is likely that the first development parcels will be provided access from the existing roadway network so as not to be dependent on the new road being constructed.

North Hillside Road will provide the first impression of the campus and will be the viewpoint from which we understand the physical campus. Providing a distinctive road experience is paramount to conveying that the North Campus is a state-of-the-art research environment. The user experience is enhanced beginning at the site entrance by employing clear and memorable arrival sequence, and integrated landscaped areas that expand on the architecture and natural site features. The road experience should express the commitment to quality work and research space and a sustainable site through commitment to the living landscape as a green, thriving and memorable setting for the work and that occurs here.

While the cross section of the road is only 30 feet wide, construction and associated grading will disturb a swath of the existing forest averaging 150 feet wide and extending up to well over 200 feet at select points. The extent of site disturbance and tree removals will fundamentally change the character of North Campus. The CTDOT roadway construction plans call for seeding disturbed areas with lawn grasses. No native-tree, understory or meadow grass restoration planting is included in CTDOT plans for the Road.

North Hillside Road Extension Restoration
- Construction will disturb 30 acres of forest, meadow and farm landscape and revegetate disturbed with turf grasses
- Plan and Fund Integrated vegetation restoration approach that restores functionality of disturbed landscape
- Repair edges of forest exposed by roadway clearing
- Selectively prune and remove damaged trees
- Plant ‘shade curtain’ of trees and understory plants to shade forest floor at cut edged
- Control invasive plants after disturbance
- Allow for more architectural clearly designed landscape and planting restoration
Parking

Given the rural and suburban location of the site, the automobile is by far the most prevalent means of transportation; therefore, parking is a major consideration and component of the master plan. As uses within the Technology Park are expected to vary from research and laboratory spaces to academic and amenities, parking will be dependent on the final programming for each parcel.

While the master plan area currently does not fall under the jurisdiction of local zoning rules, the following considerations suggest a framework for arriving at a suitable parking ratio:

• UConn North Campus Master Plan and North Hillside Road Extension environmental impact statement: 3.33 parking spaces per 1,000 square feet

• Mansfield Zoning: While no research use is defined, office space is 4 parking spaces per 1,000 square feet and industrial is 1 parking space per 2,000 square feet (or one space per two employees, whichever is greater)

• Tech Park Precedents: 3 to 5 parking spaces per 1,000 square feet, on average

Based on this data, a parking ratio of 3.33 / 1,000 square feet was used as a framework for the master plan. Note that surface or structured parking can be constructed within phases using a lower ratio; however, each parcel should be able to accommodate the parking requirements of the individual facility and program.

The impact of parking on the master plan and character of North Campus should not be underestimated. Balancing the convenience of Technology Park users with the preservation of the site’s natural beauty will be a challenge in this heavily wooded area. While multi-story parking structures could ease the demand on land for parking, their additional cost must be factored into the overall cost model strategy to determine whether it adversely impacts the ability of the Technology Park to attract tenants and developers. Over the long term, a solution that involves remote parking with shuttle bus service might also be a consideration as the Technology Park reaches a critical mass.

Standard practice assumes that each parking space requires 300 square feet (including aisles, corners, etc.) which would require a 1:1 ratio of tenant floor area to parking area. Using these standards would result in 21 acres of parking in a 900,000-square-foot build-out scenario.

The sloped topography of North Campus will require that surface parking be terraced using vegetated slopes or retaining walls. Retaining walls and associated guide rails offer a more efficient use of space at a significantly higher cost than vegetated slopes. Vegetated slopes between the parking aisles will be a more cost-effective way to address the slope, but they require much more area per parking space. Depending on the slope and parking lot layout, such a terraced lot may require over 500 square feet per parking space (including aisles corners and terraced landscaped islands).

At a 900,000-square-foot build-out scenario, approximately 34 acres of terraced surface parking would be required. The increased area required for terraced parking would entail higher development costs than standard parking lots on flat slopes because of additional forest-clearing and grading costs, the establishment of vegetated slopes, installation of guide rails, additional storm water-management requirements, and more complex utility runs. Additionally, it is generally impractical to accommodate barrier-free access to the outlying sections of steeply terraced parking lots.
Subsurface and structured parking, a significantly more costly option than surface parking, should be considered as an alternative to surface parking for the North Campus. In addition to limiting disturbance to the North Campus landscape, these types of lots offer advantages such as eliminating snow plowing and salting costs, reducing landscape and paving surface maintenance costs and providing increased barrier free access to all areas of the parking facility. A cost-benefit analysis of structured parking should be considered during the development of each parcel.

It should be noted that at this stage, the number of parking spaces for the Phase 1 building have been adjusted downward based upon an analysis of the actual program components and related user numbers. The same adjustment has been made for the parking of the future phase building in the Innovation Core Neighborhood.

Parking Landscape

- Utilize structured parking to the extent possible to minimize site coverage
- Pull as much of the parking away from road where possible
- Terrace parking to minimize visual impact of parking from roadway
- Plant significant vegetative buffers between parking lots and North Hillside Road that relate to green connectors visually and functionally.
- Provided adequate planting area between parking bays creating forested fingers that connect to the larger landscape Provided adequate planting area between parking bays to create abstracted forest
- Provided adequate planting area between parking bays creating abstracted forest
- Provided adequate planting area between parking bays creating abstracted forest
- Vegetated islands to provide storm water management, shade paving, filter particulates
- Use pervious paving in parking bays and lightly travel parking lot lanes to minimize storm water runoff
- Install vegetated swales and rain gardens at low edge of parking lots to intercept run off that may alter the moisture balance in wetland and upland areas
- Tech Park development should take measures to mitigate the visual impact of parking by utilizing such methods as: structured parking, terraced parking, bermed/screened parking.
Parking Study #1

- Site Area: 29,244 sf
- Pervious: 0 sf (0.00 acre)
- Impervious: 29,244 sf (0.68 acre)
- # Spaces: 83

Parking Study #2

- Site Area: 29,244 sf
- Pervious: 2,707 sf (0.06 acre)
- Impervious: 26,527 sf (0.61 acre)
- # Spaces: 81

Parking Study #3

- Site Area: 31,494 sf
- Pervious: 5,164 sf (0.12 acre)
- Impervious: 26,330 sf (0.60 acre)
- # Spaces: 77

Parking Study #4

- Site Area: 32,909 sf
- Pervious: 6,862 sf (0.16 acre)
- Impervious: 26,047 sf (0.60 acre)
- # Spaces: 62
Site Restoration Planning

Like many land-development projects, the proposed Technical and Research Campus at UConn will have a major impact on natural ecosystems such as the UConn forest and on orderly ecological succession. Such urbanizing development and associated “land cover changes and pollution loading - is the major factor altering the structure, function and dynamics of Earth’s terrestrial and aquatic ecosystems.” Land development contributes to climate change, pollution and alters biotic and abiotic at the site and well beyond the site. In suburban areas land development projects alter ecosystems and disturb ecological succession more often than fire, floods, wind-throw and lava flows. Yet, study of the ecological impact of development is still required to advance the understanding of urbanization and how landscape technologies can effectively mitigate impacts.

Acknowledging that the North Campus will be fragmented by development provides an opportunity to explore new approaches to landscape restoration that addresses post-development ecological function. To better align with the goals of the Technical and Research Campus, restoration technologies should be crafted as observable and measurable interventions that address development impacts rather than strict imitation of natural forms.

Today, the North Campus is characterized by its landscape of mature hardwood forest, rolling topography, stream corridors, wetland acres and prime farmland. The Master Plan employs landscape to create the overarching framework that will serve to create a unique identity and distinctive address for the Technical and Research Campus. Significant effort and funding must be allocated to site restoration planning and implementation to create the cohesive landscape framework envisioned for the campus.

The following development guidelines are essential to establishing a cohesive, functioning landscape framework for the Technical and Research Campus:

Prepare for Site Development Activities

Setting up monitoring programs for the site prior to the start of CTDOT or campus construction will be crucial to establishing data on the impact of construction on site conditions and systems.

Implement forest harvesting and demonstration projects in projected disturbance area. Refer to proposal for forestry activities for North Campus Expansion by Thomas. E. Worthily, Assistant Extension Professor and Chair, UConn Forest Management Committee and Dr. John C. Volin, Professor and Head Department of Natural Resources and the Environment.
Site Restoration Planning (Con’t)

Initiate North Hillside Road Landscape Restoration

Develop integrated landscape restoration approach for areas disturbed during the construction of North Hillside Road – The engineered drainage and seeded lawns specified for all disturbed area per the CTDOT plans will have significant visual and functional effects on the landscape, such as the invasion of exotic or competitive plant species. Disruption of animal migration routes and alteration of historic drainage patterns will occur and may affect wetlands beyond the disturbed area. Planning landscape corridors, grading and vegetation that address these impacts and that reinforce the Tech campus corridors and spaces will be critical to establishing a visual and functional campus framework.

Fund landscape restoration implementation - The CTDOT plan to establish seeded lawn grasses on all disturbed areas is the least costly method for stabilizing vegetation. Funding for more-effective revegetation using native and adapted tree and shrub plantings to shade cut forest edges, mitigate stormwater flow and reduce reliance on lawn mowing and maintenance programs should be sought so that landscape installation can be scheduled immediately following road construction.

Reduce building footprint - Minimizing the footprint of buildings by building up rather than out and by employing multi-level parking garages will minimize site disturbance and preserve larger areas of the North Campus landscape.

Establish and maintain strict disturbance limits – Contractors shall submit plans for construction access and stockpile and staging that avoid sensitive site areas for UConn approval before construction. Enforce the disturbance limit throughout construction to protect vegetation and prevent soil compaction at the perimeter of building sites.

Enhance campus and public transportation options to reduce the requirement for parking private vehicles

Use a lower parking ratio for the initial building – Establish temporary parking lots on site while assessing parking requirements.

Establish and maintain strict disturbance limits – Contractors shall submit plans for construction access and stockpile and staging that avoid sensitive site areas for UConn approval before construction. Enforce the disturbance limit throughout construction to protect vegetation and prevent soil compaction at the perimeter of building sites.

Mitigate Necessary Site Disturbance

Employ innovative tree preservation technologies – Where appropriate, employ vertical mulching, Pneumatic trenching, root pruning in areas where grading will occur.

Minimize the extent of grading – Use steeper short slopes to minimize the extent of grading. Employ soil reinforcements like coir logs, cobbles, geotextiles and fibrous rooted plantings on moderate slopes; use soil nailing, gabions, retaining and living walls where more significant grade changes will occur.

Restore disturbed forest edges – After clearing the forest for construction the exposed edge of remaining trees are typically tall, spindly and high branched. Many of the trees are damaged by clearing operations and soil compaction. Restoration along the edge of clearing should consist of: 1) selectively removing trees that are damaged, weak or appear likely to topple or decline. 2. developing a shade curtain with plantings of native an adapted trees and shrubs that will shade the forest floor and minimize the invasion of exotic or competitive plants that may further reduce ecosystem function.
Restore disturbed fields and farmlands and lowlands – Plant simple masses and mixed groupings of sustainable plantings adapted to new soil and microclimatic conditions. Functional value of plantings to tolerate compacted soils, enhance evapotranspiration of stormwater or provide habitat should be considered along with how plantings enhance architecture and create unique campus spaces. The development of effective plant combinations and functional systems should contrast the specimen arboretum approach employed on the academic campus. Abstracted versions of forests, hedgerows and crop rows that result from new planting technology and lend themselves to academic research may serve as an effective visual tie to the mature hardwood forest, rolling topography, stream corridors, wetland acres and prime farmland beyond the newly developed campus.

Locate stormwater management, site utilities and underground systems to minimize root disturbance – Thoughtful location of underground piping, transformers and lighting may entail routing under roads, parking lots and other disturbed areas or considering longer runs around sensitive areas or valuable vegetation. Underground pipes and storm water management structures may need to be structurally enhanced to work under parking/loading areas.

Consider individually powered site utilities for outlying site areas – Relying on solar or alternatively powered site lighting, wireless cameras and communication on trails and parking areas beyond the developed road corridor would provide minimize trenching for utility runs in the forest.
Sustainability

All development within the Tech Park is anticipated to utilize the Leadership in Energy & Environmental Design (LEED) Silver rating as a minimum performance requirement. This will impact the site and building design and construction.

In conjunction with the Campus Sustainable Guidelines and Landscape Master Plan & Design Guidelines, the following strategies can be implemented throughout the development:

- Preservation and protection of natural resources and the minimization of necessary impacts
- Connection of various nodes of development through bicycle and pedestrian pathways and the provision of appropriate storage and changing facilities
- Low Impact Development (LID) measures for stormwater conveyance and quality treatment including vegetated swales and rain gardens. The traditional detention basin that serves the Charter Oak Apartments can be relocated and replaced with low impact designs while increasing the development footprint of Parcel C.
- Providing groundwater recharge
- Assess the feasibility of geothermal systems
- Providing water efficient landscape planting and the use of rainwater harvesting or reclaimed water
- Providing site lighting that reduces light pollution such as cut-off fixtures
- These measures could also be compatible to the civil engineering curriculum as a living example of site sustainability.

Base Sustainable Design Items

- High efficiency gas-fired condensing boilers
- High efficiency water cooled centrifugal chillers with VFD
• Campus sewage treatment plant reclaimed water used for cooling tower make-up.

• Lab/Office air handling units will include heat energy recovery

• Active chilled beams for space sensible cooling

• Low cooling coil and filter face velocity (< 400 fpm) at air handling units.

• Low duct velocity (< 1500 fpm) for supply/return/exhaust risers and mains.

• Low pressure (< 0.5") supply and exhaust air valves and terminal boxes.

• Motor efficiencies to exceed ASHRAE 90.1-2007 minimum (premium efficient).

• Occupied/Unoccupied setback of temperature and minimum ventilation setback within offices and public spaces.

• Zone level supply/exhaust air tracking control to enhance laboratory exhaust containment.

• VAV fume hood control (via sash sensing) in spaces with high fume hood density.

• CO2 monitoring of indoor air quality within high occupancy spaces (seminar and conference rooms), coupled with zone level demand control ventilation.

• Site Air Quality Assessment Report to ensure proper air quality at building air intakes and operable windows.

• Cooling coil condensate recovery, to be reused for irrigation, grey water, or power plant tower make-up.

• Reduced allowance for equipment (plug) load densities.

**Additional Sustainable Design Opportunities to be Considered**

- Cogeneration or Trigeneration.

- Optimize building orientation.

- Konvekta or run-around loop exhaust air sensible recovery.

- Heat recovery chillers.

- Central air quality monitoring system (e.g. Aircuity), coupled with laboratory demand control ventilation (to allow minimum lab ventilation rates below 4 ach).

- Hybrid (mechanical/natural) ventilation of perimeter office space via window open sensor and supply air terminal box/chilled beam shut-off.

- Solar thermal for domestic water preheat.

- Solar PV.
Site Development & Ownership

While ownership offers the greatest control of this valuable asset, other development scenarios may be considered as the Tech Park evolves. If the sale of land within the Tech Park district is desirable, it is Parcel B, on the eastern perimeter of the site with its direct access to 195 which best lends itself to this. The sale of other, more interior parcels would have greater potential to compromise future long-term University needs. UConn currently owns all the parcels in the North Campus area. Should the University sell individual parcels for development, the following requirements should be considered:

- **Zoning** – State projects are exempt from local permitting requirements including zoning and wetlands. However, should UConn sell parcels to private entities to develop, all required local permits may need to be obtained prior to construction. These may require additional setbacks, restrictions, and requirements such as provided parking.

- **Easements** – Depending on the final parcel configuration, easements may be required for access, parking, utilities, or drainage rights if UConn does not own the land.

- **Electricity** – UConn has the ability to generate electricity to its own facilities, however, they are prohibited from selling electricity. Selling the parcels would require electricity fed from CL&P.

- **Design Guidelines** – UConn may consider maintaining some control over the manner in which a sold parcel is developed (above and beyond local zoning guidelines.) In order to maintain a unity of expression, character and quality of open space, the university may wish to stipulate guidelines regarding issues such as building materials, screening of mechanical equipment and the landscaping of parking lots.