

MAY 2011

# UNIVERSITY OF NORTH TEXAS

Discovery Park Master Plan Update



SASAKI



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# EXECUTIVE SUMMARY



## DISCOVERY PARK VISION

The development of Discovery Park, the University of North Texas at Denton's (UNT Denton or UNT) innovative research park, represents a major step forward in advancing the University's ten year Strategic Plan for Research and its mission to become a major national research university. Building on the University's dynamic research culture, and an existing base of research activity, Discovery Park will become a vibrant research community, defined by leading-edge University and private research, as well as collaborations between the two. A culture of innovation and entrepreneurship will encourage start-ups, business incubation, technology transfer and new job creation, enhancing UNT's reputation both regionally and nationally. Over time, Discovery Park will emerge as one of the most innovative settings for research, business incubation and technology transfer in the Dallas-Fort Worth region.

The master plan and design guidelines for Discovery Park will provide for the evolution of the Discovery Park site from a former Texas Instruments manufacturing facility to a dynamic setting for scientific and technological research that will position UNT as a leading regional, state and national research destination. The plan articulates a comprehensive vision and long-term program strategy for the Park that is founded on the University's strategic research priorities and the economic potential of the Park, as well as relationships with the University's main campus. The plan provides a framework for development that establishes a unique identity for the Park while allowing for adaptation to future needs. It also provides comprehensive site, architectural and landscape design guidelines to ensure consistent, high quality, sustainable site development.

The master plan and design guidelines for Discovery Park will guide the evolution of the Discovery Park site from a former manufacturing facility to a dynamic setting for research that will position UNT as a national research destination.

Upon arrival at the park, researchers will be welcomed through new gateways to distinct research precincts dedicated to University or private research. The existing Texas Instruments building will be renovated to become a bright, open, and contemporary environment with state-of-the-art labs, flexible space and support amenities. It will become Discovery Park's Central Building and the core of park development. To the east of the Central Building, a new East UNT Research Precinct will accommodate nearly 500,000 square feet of new University research space. To the west, the new West Science and Technology Precinct will house another 850,000 square feet of private research facilities. A re-invented pedestrian walkway system in the Central Building will be extended to connect all areas of the campus, and will include a new East Mall, running north-south through the East Precinct, and a new Central Park in the West Science and Technology Precinct. Research activity will be highly visible along the pedestrian network, encouraging interaction and collaboration.

Buildings will be connected to surrounding open spaces, which will consist of the new East Mall and Central Park, intimately-scaled courtyards, preserved areas of natural habitat, and recreation areas. The open space network will be designed with water-receiving landscapes to manage stormwater sensitively. Other sustainable solutions will reduce the Park's environmental impact and operations costs through increased efficiency, new technologies, and utilization of existing natural systems. Sustainable solutions like stormwater management systems and shade structures will also serve as visual amenities in the Park.

The Discovery Park master plan is the result of a multi-phase process, which engaged key stakeholders in creating a new vision for the Park. The consultant team completed a site analysis, tested planning framework options, and developed the final master plan and design guidelines.



DEVELOPMENT AT DISCOVERY PARK WILL BE CENTERED AROUND A VIBRANT PEDESTRIAN NETWORK AND GREEN SPACES

Building on the University's dynamic research culture, and an existing base of scientific and technological research activity, Discovery Park will become a vibrant research community, defined by leading-edge University and private research, as well as collaborations between the two.





The development of Discovery Park, the University of North Texas at Denton's innovative research park, represents a major step forward in advancing the University's ten year Strategic Plan for Research and its mission to become a major national research university.

◀ DISCOVERY PARK WILL BE OPEN AND CONNECTED



THE WEST Science and Technology PRECINCT WILL BE ORIENTED AROUND A CENTRAL PARK WITH SHADED PEDESTRIAN WALKWAYS WHERE RESEARCHERS WILL MEET AND CHAT.

THE CENTRAL SPACE WILL SERVE AS BOTH A RECREATION DESTINATION AND A STORMWATER INFILTRATION AREA.

## UNT'S RESEARCH AGENDA

Currently classified as a Carnegie Foundation High Research Activity institution, the University has committed to meeting the Texas House Bill 51 Challenge to become a national research university, and eventually attain the status of a Carnegie Very High Research Activity institution. In early 2010, the University adopted its new Strategic Plan for Research 2011–2020, which establishes several priorities to achieve this ambitious goal:

1. Expand external research funding from the current Texas Higher Education Coordinating Board (THECB) restricted expenditures of \$11.2 million and National Science Foundation (NSF) expenditures of \$24.1 million to over \$100 million in ten years
2. Invest in strategic priority areas:
  - Next Generation Technologies
  - Sustainable Endeavors
  - Human Decision Making
  - Human Health
  - Synergistic Catalysts
3. Improve undergraduate education
4. Expand and improve doctoral education
5. Enhance faculty and student development
6. Expand research facilities and resources
  - Reassign, renovate, and reallocate space
  - Complete new construction, including a new interdisciplinary Science and Technology building
7. Increase UNT's national visibility





The *Strategic Plan for Research* defines a central role for Discovery Park in advancing the University's research priorities with a new research facility planned in the immediate term, and significant growth of scientific and technological research over the long term. Discussions with University administration suggest that at least fifty percent of new research activity could be directed to the Park and matched with equivalent private sector investment. Over time, academic programs currently housed in the existing building may be relocated to the main campus, freeing up space for University research. Support programs may also be relocated to the main campus or other location.

Discovery Park fills a significant need in the Dallas-Fort Worth region and is the only research park of its kind in the area. It possesses an established research culture and strong relationships with the academic and research communities on UNT's main campus. With recent and planned investments in new state-of-the-art research labs and 189 acres of land to accommodate new research facilities, it is well-positioned to support the University's research agenda, foster new academic and business relationships, and elevate the research standing of the region as a whole.

◀ VIEW OF DISCOVERY PARK, FROM THE EAST



RESEARCHERS WILL ENJOY REFRESHING COURTYARD SPACES AND LIGHT-FILLED BUILDINGS

## PROGRAM STRUCTURE

The program for Discovery Park is driven by the University's strategic research priorities and vision for the Park, as well as long-term plans for UNT's main campus.

The University may need to accommodate about one half of the research activity generated by the over \$100 million in research funding anticipated by the Strategic Plan for Research 2011-2021 at Discovery Park, with the balance on the main campus. This translates into a need for at least 850,000 square feet of new research space. The concentration of University research at Discovery Park is expected to attract a significant level of private research that will take advantage of the Park's high quality facilities and access to researchers and students. Demand for another 850,000 square feet of private research space is anticipated.

To accommodate the demand for research space, and to rationalize academic program delivery on the main campus, the University may relocate academic and support programs currently located in the existing building to the main campus or other location. Private research partners that locate in the Park will be accommodated in new, purpose-built facilities on leased parcels located within the West Science and Technology Precinct.



# CONTEXT & PROCESS



UNT HAS EVOLVED SIGNIFICANTLY OVER ITS 120-YEAR HISTORY AND IS NOW THE  
FOURTH LARGEST UNIVERSITY IN TEXAS

## BACKGROUND

Founded in 1890 by Joshua C. Chilton, UNT Denton started as the Texas Normal College and Teacher Training Institute on the second floor of a hardware store on the town square in Denton. UNT has evolved significantly over its 120-year history and is now the fourth largest university in Texas and the most comprehensive university in the Dallas–Fort Worth area, offering 97 bachelor’s, 101 master’s and 48 doctoral degree programs. UNT is dedicated to harnessing the power of ideas through a culture of learning based on diverse viewpoints, interdisciplinary endeavors, creativity and disciplined excellence.

UNT purchased the Discovery Park site and existing development approximately ten years ago with the goal of establishing a research park to support the University’s mission, while also providing space for the University’s Colleges of Engineering and Information. The original vision for the Park was to create a new setting for science and technology research that would provide space for both University and private research, facilitate partnerships, and foster technology transfers and startups from the University to the private sector. A master plan for the Park was prepared in 2005 to facilitate development of the site in accordance with this vision. While the early plans for the Park were ambitious, no significant demand for research space in the existing building emerged. With significant space constraints on the main campus, the University elected to make use of the Discovery Park facility to address immediate priorities, and relocated additional academic and administrative programs to the existing building. Within a few years, most of the space in the building was absorbed, leaving limited free space to accommodate new research partners.

In 2008, the University engaged consultants from the Association of University Research Parks (AURP) to create a plan of action to advance the original vision for Discovery Park. The AURP's ten principal recommendations were as follows:

1. Hire a Discovery Park director.
2. Establish a non-profit organization or foundation to manage the Park.
3. Recruit a chairperson to form a Board of Directors.
4. Create a comprehensive mission statement.
5. Ascertain UNT's present, future, and potential research strengths.
6. Determine University land requirements and how Discovery Park may accommodate those needs. Brand only first phase land as 'Research Park'.
7. Prepare a feasibility study, business plan and new master plan.
8. Set Park boundaries and obtain funding for infrastructure. Improve site appearance.
9. Establish a high-tech, locally relevant business incubator.
10. Develop a new multi-use building after existing space is absorbed.

The project to update the Discovery Park master plan began with these recommendations.



THE EXISTING SITE INFRASTRUCTURE AT DISCOVERY PARK PROVIDES THE OPPORTUNITY TO CREATE A STRONG PEDESTRIAN NETWORK AND PRESERVE NATURAL AREAS



DISCOVERY PARK IN 2010

## PLANNING PROCESS

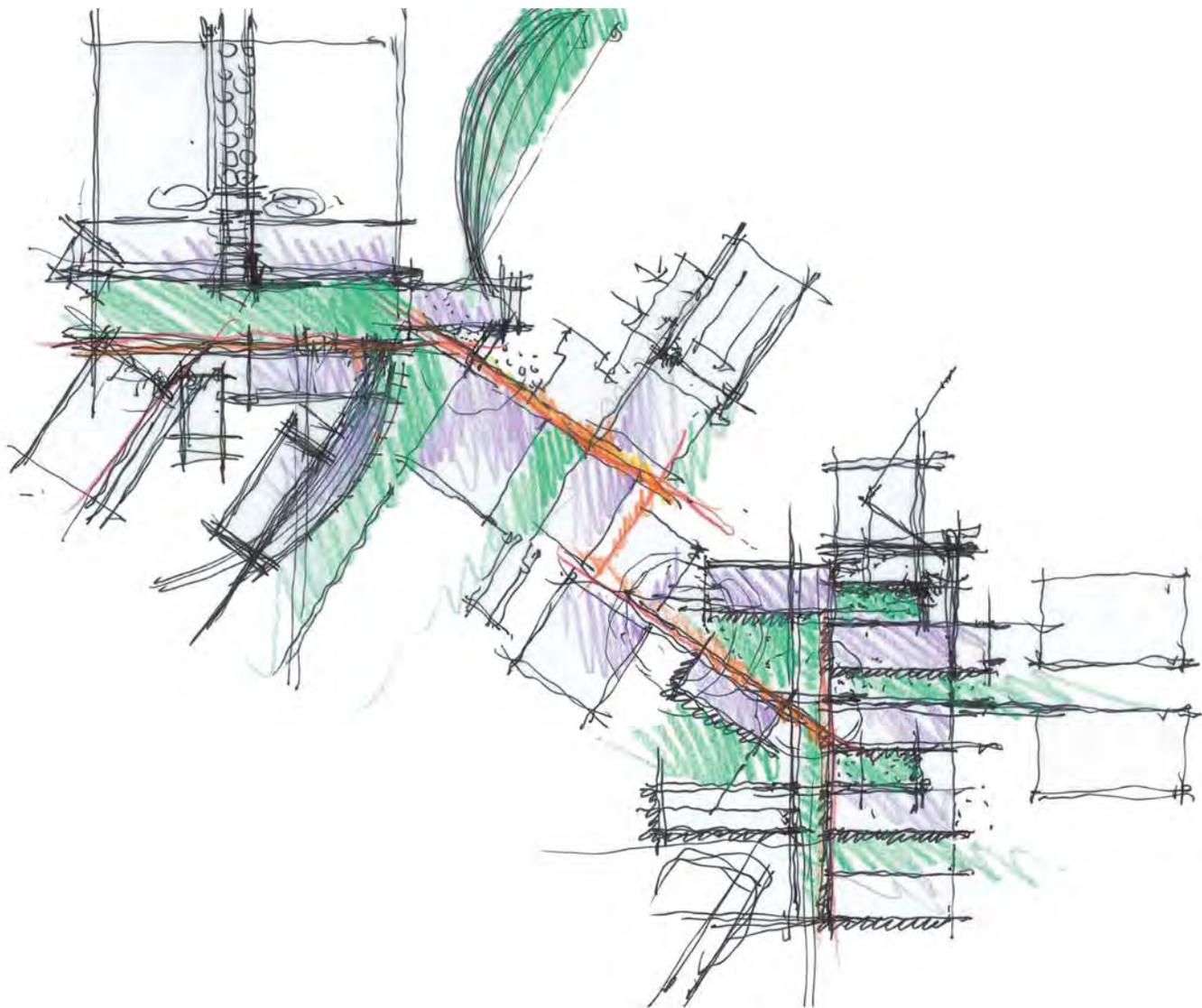
The Discovery Park master plan update was prepared through a three-phase process, led by a Master Plan Committee composed of senior University administrators and faculty. Core members of the Committee included the following:

- Richard Escalante, Vice Chancellor for Administrative Services
- Dr. Warren Burggren, Provost and Vice President for Academic Affairs
- Dr. Vish Prasad, Vice President for Research and Economic Development
- Dr. Costas Tsatsoulis, Dean, College of Engineering
- Dr. Herman Totten, Dean, College of Information
- Harold Strong, Director, Discovery Park and Technology Transfer

Additional team members participating in the process included:

- Meredith Butler, Senior Facilities Planner, UNT System
- Darlene Callahan, Director, Office of Space Management and Planning
- Karen Dickson, Vice President, Economic Development, Denton Chamber of Commerce
- Charles Jackson, Acting Senior Associate Vice President for Administration
- Dr. Rodney P. McClendon, Senior Associate Vice President for Operations
- Dr. Tony Mendes, Director, Murphy Center for Entrepreneurship & Clinical Professor, Department of Management
- Dr. Dale Tampke, Dean, Undergraduate Studies
- Dr. Ruthanne D. Thomas, Associate Vice President for Research

Phase One of the process included a comprehensive analysis of site conditions, including an investigation of utility infrastructure capacity, and an assessment of the potential for sustainable infrastructure infrastructure solutions. Phase One also involved interviews with key Discovery Park stakeholders, including the members of the Master Plan Committee, City of Denton planning officials, utility providers, and other stakeholders.

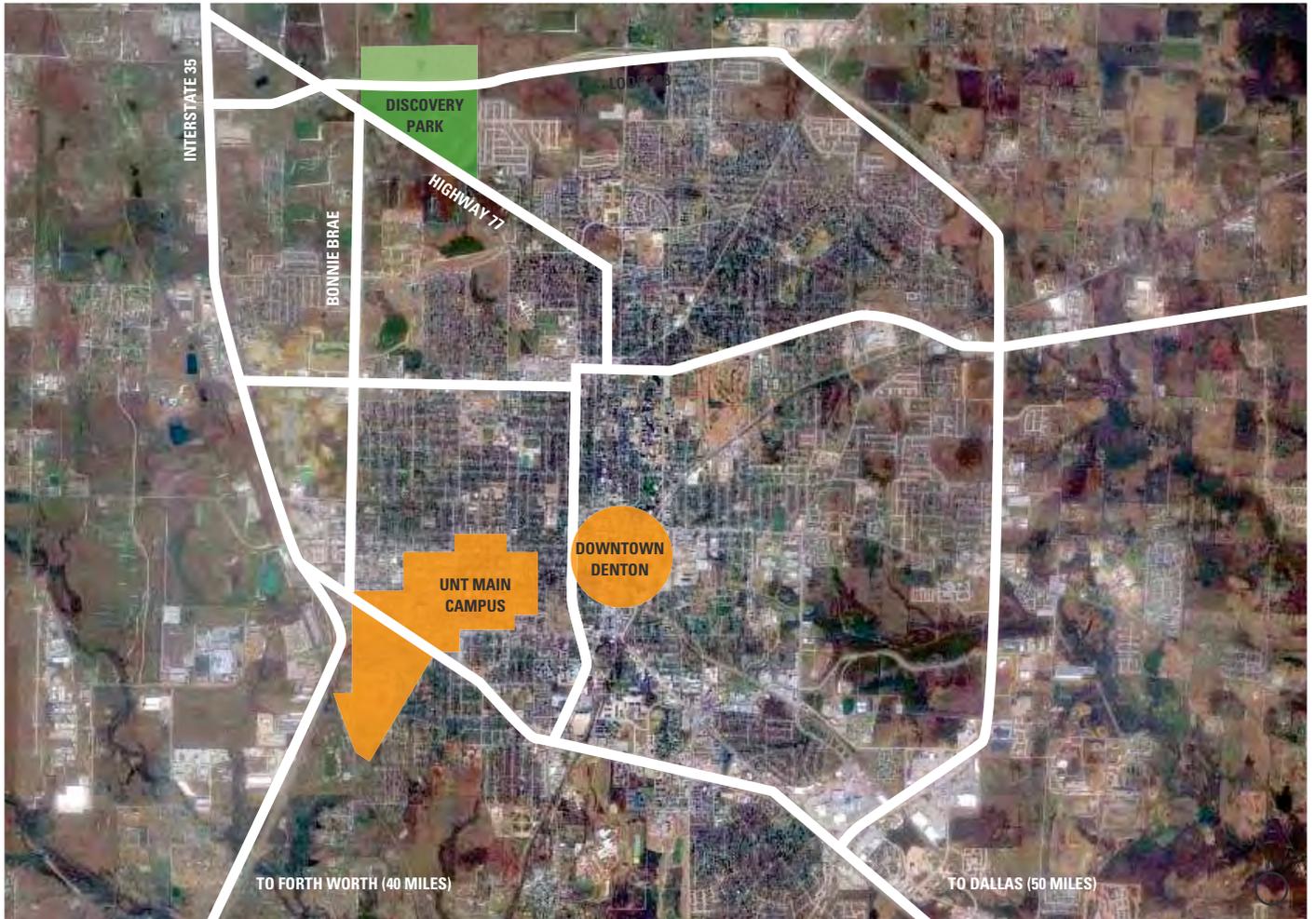


A PRELIMINARY SKETCH OF DISCOVERY PARK CREATED DURING THE PLANNING PROCESS

The stakeholder interviews revealed that there were very different perspectives on the future of the Park, and there was no clear consensus on the goal to further develop the Park for research purposes. To advance the planning process, the consultant team held a work session with the Master Plan Committee to facilitate dialogue on the future of the Park. At the work session, the consultants presented a range of research park precedents and models, as well as options for the distribution of academic and research uses between Discovery Park and the main UNT-Denton campus. The product of the work session was renewed consensus on the vision for the Park, as well as a long-term program of University and private research uses.

The renewed vision and program formed the basis for the development of a new planning framework and design guidelines during Phase Two of the planning process. The planning framework established an overall structure for the long-term accommodation of University and private research uses, centered around the existing building. Draft urban design, architectural and landscape guidelines were also developed in support of the planning framework. The consultant team presented the framework and guidelines at another work session with the Master Plan Committee at the conclusion of Phase Two.

The final Discovery Park master plan and design guidelines, which are documented in this report, were developed based on direction of the framework plan from the Master Plan Committee.



DISCOVERY PARK IS LOCATED IN NORTHWEST DENTON, TEXAS, APPROXIMATELY THREE MILES NORTH OF THE MAIN UNT DENTON CAMPUS

# PLANNING CONTEXT

## Location

Discovery Park is located in northwest Denton, Texas, approximately three miles north of the main UNT Denton Campus, thirty miles from Dallas/Fort Worth International Airport, and fifty miles from downtown Dallas. The site has excellent access to national, regional, and local roadways, including Interstate 35, US 77 (North Elm Street), Loop 288, and Bonnie Brae, a major north/south arterial that provides a strong connection between Discovery Park and the main campus. The main site comprises 189 acres of land, and there is an additional 96-acre site on the north side of Loop 288. This plan focuses on the main site and leaves the northern parcel in reserve for future development.

Secondary roads provide bicycle access to the site from the UNT main campus. Pedestrian access to the site is limited. In the long term, urbanization of the surrounding areas is expected, particularly to the north and west, where the City of Denton has recently annexed land.

## Current and Future Neighbors

Discovery Park currently has few neighbors, as it is located at the edge of the Denton urban area. The only existing development near the Park is a single-family residential subdivision to the east of the site. Access to this community occurs from Route 77, and there are no connections between the Discovery Park site and the subdivision.

The City of Denton's Future Land Use Plan includes the Discovery Park site within an area designated Regional Mixed Use Center that extends south across Route 77, west past US 35, and north and south along US 35. The area to the south of Loop 288 is currently zoned Regional Center Commercial Downtown, as are sites directly south and northwest along Route 77. These centers are intended to serve as major commercial hubs for Denton and the surrounding region, and contain activities including shopping, services, recreation, employment and institutional facilities. The area north of Loop 288 is zoned as a Regional Center Commercial Neighborhood, while land to the north of that is designated as Master Planned Communities (MPC).

## Existing Facilities

The Discovery Park site currently contains a 553,000 gsf two-story building that was constructed in 1988 by Texas Instruments (TI) for defense electronic systems development and production. The facility was in operation for four years before it was decommissioned. The original building contained two former manufacturing modules, a central administration module, a warehouse and a chemical dock.

UNT purchased the property in 2001 with the intention of establishing a research park, while also providing space for the University's College of Engineering. Since that time, UNT has invested more than \$18 million in renovating and repurposing the building. Most of the space within the building has been allocated to the College of Engineering, the College of Information, and UNT's Computing and Information Technology Center (CITC). Table 1 summarizes space allocation within the building as of December 2009.

The façade of the existing building is composed of brick and darkly tinted ribbon windows. From the outside, the building lacks transparency. Internal circulation occurs through a system of double-height corridors crossed by catwalks. The corridors create a strong sense of orientation around which various functions are organized. Due to the very deep floor plate, some of the building's internal spaces lack natural light, although there are pleasant views into landscaped courtyards in several areas.

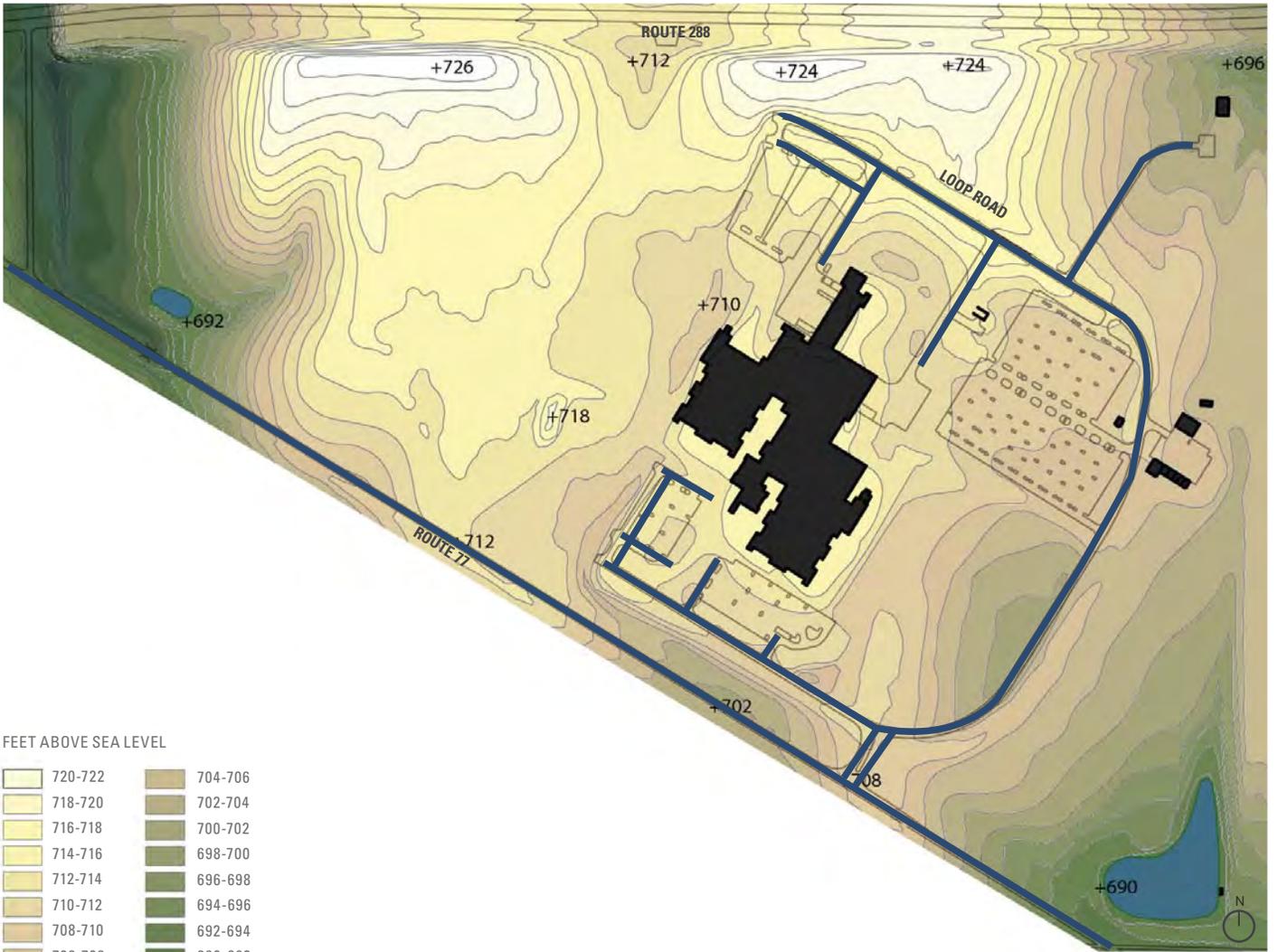
The site also contains two independent buildings: a grounds and maintenance building and a former testing building.



DISCOVERY PARK'S EXISTING BUILDING HAS A UNIQUE DOUBLE-HEIGHT CIRCULATION SYSTEM. THE BUILDING CURRENTLY HOUSES THE COLLEGES OF ENGINEERING AND INFORMATION.

TABLE 1. EXISTING TI BUILDING SPACE ALLOCATION

COLLEGE OF ENGINEERING	5,635
ENGINEERING TECHNOLOGY	43,736
COMPUTER SCIENCE AND ENGINEERING	29,959
MECHANICAL AND ENERGY ENGINEERING	10,815
ELECTRICAL ENGINEERING	16,398
MATERIALS SCIENCE AND ENGINEERING	17,416
BIOMEDICAL ENGINEERING	10,980
<b>SUBTOTAL</b>	<b>134,939</b>
COLLEGE OF INFORMATION	6,562
LEARNING TECHNOLOGY	11,200
LIBRARY AND INFORMATION SCIENCE	4,432
TEXAS CENTER FOR DIGITAL KNOWLEDGE	855
<b>SUBTOTAL</b>	<b>23,049</b>
CITC SHARED SPACES	29,222
CLASSROOMS	16,921
LIBRARY	10,455
CART	3,138
DISCOVERY PARK	3,619
FOOD SERVICE	7,052
CENTER FOR STUDENT DEVELOPMENT	2,506
BUILDING MAINTENANCE, POLICE, HOUSEKEEPING	9,490
<b>SUBTOTAL</b>	<b>82,403</b>
<b>TOTAL</b>	<b>240,391</b>



FEET ABOVE SEA LEVEL

720-722	704-706
718-720	702-704
716-718	700-702
714-716	698-700
712-714	696-698
710-712	694-696
708-710	692-694
706-708	690-692

EXISTING CIRCULATION TOPOGRAPHY AND DEVELOPMENT AT DISCOVERY PARK

→ ROAD



AN EXISTING DETENTION POND AND NATIVE SHRUBS

## Access and Circulation

Vehicular access to the site is currently off Route 77. Internal circulation occurs along a partial loop road located in the eastern portion of the site. The original plan for the site provided for the extension and completion of the loop, and the introduction of a second right-in / right-out entrance from Loop 288. These elements were never developed, although curb cuts for the Loop 288 access are in place.

The site contains 1,300 parking spaces, or approximately 2.36 spaces per 1,000 square feet of existing development. Parking is located along the periphery of the existing facility in four surface parking areas.

## Site Conditions

The site is relatively flat in the eastern portion and in the areas that have been developed. To the west, the land is more varied and slopes downward toward Loop 288. This portion of the site has good visibility from Loop 288.

The landscape of the eastern portion of the site, including the area surrounding the existing building, consists principally of lawn with several small groupings of trees, while the western portion of the site contains larger areas of native shrubs and trees.

## Storm Drainage

The site is divided into five stormwater catchment areas within the north, south and west portions of the site. Stormwater is channeled through closed drainage systems that collect roof, lawn and parking lot runoff and direct it to detention ponds in the southern and western corners of the site, as well as a swale located next to Route 77. There are four existing culverts located along the south side of the site that pipe stormwater runoff across Route 77.

The stormwater drainage system was originally planned to accommodate the existing development and proposed expansion of the TI facility, which included additions to the east and west. The proposed expansion consisted of vegetated swales within parking areas to provide immediate stormwater infiltration and to decrease the runoff rate. Another swale located at the perimeter of the site was intended to channel runoff to the existing detention ponds. On the north side of the site the swale cannot be connected to a detention pond because of topography, so a closed system was planned to connect with the Loop 288 storm drainage system.

## Ecological Context

Discovery Park is located in the Cross Timbers Bioregion, a bio-diverse part of the Texas Plains that receives about 47 inches of rain a year. The landscape of this bioregion is characterized by rolling grasslands and brushy stands of trees. Habitat fragmentation and alteration are of major concern in this area. Natural areas of the Discovery Park site have the potential to serve as a flyway for migratory birds and as habitat for native species.

## Soil Conditions

Soil condition data is based on the Soil Survey Map prepared by the United States Department of Agriculture Soil Conservation Service. The site contains a variety of soil types, including Clay Loam, Fine Sandy Loam, a pocket of Birome-Rayex-Aubrey complex, and others. The permeability of soil ranges from moderately slow to very slow. The soils present on the site are summarized in Table 2.

TABLE 2. DISCOVERY PARK SOIL TYPES

SOIL NAME	SLOPES (%)	PERMEABILITY
BIROME RAYEX AUBREY COMPLEX	2-15	SLOW
JUSTIN FINE SANDY LOAM	1-3	MODERATELY SLOW
LINDALE CLAY LOAM	1-3	SLOW
MEDLIN-SANGER CLAYS	5-15	VERY SLOW
NAVO CLAY LOAM	3-5	VERY SLOW
PONDER LOAM	1-3	VERY SLOW
SANGER CLAY	3-5	VERY SLOW
WILSON CLAY LOAM	1-3	VERY SLOW

## Utility Infrastructure

Utilities that service the site include water, electric, sanitary sewer, natural gas, drain, thermal and telecommunications. With the exception of natural gas, drainage and thermal systems, all of these utilities service the site from the municipal right-of-way within Nicosia Road. The natural gas line enters the site from a meter located on Route 77 near the current entrance to the campus. The thermal utilities are contained within the central utility plan and distributed throughout the campus via an internal network. The drainage network is comprised of a series of closed drainage systems throughout the site that collect and convey stormwater to one of two detention basins along Highway 77 prior to discharging to the City of Denton drainage network.

The existing systems were designed to support the expansion of the existing building to both the east and west. Utilities on the east side were installed to accommodate an expected early phase of expansion, while utility stubs were introduced on the west side for a future phase of development. Additional detail on existing utility infrastructure conditions and recommendations is contained in the master plan framework section of this report, as well as the appendix.

The area directly north of the existing building is relatively unencumbered by utilities and is an area where future development could occur. The area directly west of the existing complex is also relatively unencumbered and the utility stubs create the opportunity for expansion in this area. While the area to the east contains the utilities placed for the expansion of the existing building, significant development is possible without relocating these utilities.



SOME STORMWATER IS CONTAINED AND TREATED IN EXISTING OPEN AREAS



OPEN SPACE AT DISCOVERY PARK PROVIDES STORMWATER RECEIVING AS WELL AS HABITAT

## Sustainability

The master plan creates the opportunity to improve the sustainability of the Discovery Park site in several key areas: water conservation, energy conservation, and habitat preservation and restoration.

Table 3 summarizes the issues surrounding each of these elements, the goals for the master plan within each area, and potential strategies to achieve the goals. These strategies are reflected in the overall Discovery Park master plan framework, the comprehensive urban design, architecture and landscape guidelines, as well as the utility infrastructure recommendations.

TABLE 3. SUSTAINABILITY STRATEGIES

ELEMENT	ISSUES	GOALS	STRATEGIES
WATER	PEAK IRRIGATION DEMAND	REDUCE CAMPUS WATER DEMAND DURING IRRIGATION MONTHS	<ul style="list-style-type: none"> <li>• REDUCE IRRIGATION DEMAND WITH LOW- MAINTENANCE LANDSCAPES AND USE OF NATIVE SPECIES</li> <li>• COLLECT, STORE AND REUSE STORMWATER</li> <li>• IRRIGATE RECREATION FIELD STORMWATER MANAGEMENT POND</li> </ul>
	STATE REQUIREMENT TO REUSE STORMWATER FROM ROOFS 10,000 SQUARE FEET OR GREATER	REDUCE CAMPUS WATER DEMAND	<ul style="list-style-type: none"> <li>• COLLECT, STORE AND REUSE ROOF WATER</li> <li>• USE WATER EFFICIENT FIXTURES IN NEW BUILDINGS</li> <li>• CONSIDER GREY WATER USE</li> </ul>
	CONTROL STORMWATER RUNOFF	MEET AND MATCH CURRENT RUNOFF RATE AND VOLUMES AT DESIGN POINTS	<ul style="list-style-type: none"> <li>• PROMOTE INFILTRATION WITH WATER-RECEIVING LANDSCAPES AND PERMEABLE PAVING</li> <li>• INCORPORATE STORMWATER MANAGEMENT FEATURES IN PARKING LOT DESIGN</li> <li>• EMPLOY OPEN CHANNEL CONVEYANCES AND FEATURE PONDS</li> <li>• USE LOW IMPACT DEVELOPMENT (LID) PRACTICES</li> </ul>
ENERGY	ENERGY CONSERVATION AND EFFICIENCY	REDUCE CAMPUS ENERGY DEMAND ON CITY INFRASTRUCTURE	<ul style="list-style-type: none"> <li>• ARRANGE NEW BUILDINGS TO CAPTURE SUMMER BREEZES AND SCREEN WINTER WINDS</li> <li>• CREATE SMALL SCALE, SHADED COURTYARDS FOR OUTDOOR COMFORT</li> <li>• OPTIMIZE BUILDING SITING FOR SOLAR CONTROL</li> <li>• EMPLOY SHADING DEVICES TO MANAGE SOLAR GAIN</li> <li>• EMPLOY REFLECTIVE ROOF MATERIALS OR GREEN ROOFS TO REDUCE ENERGY LOAD</li> <li>• INTRODUCE OPERABLE WINDOWS</li> <li>• CONSIDER PHOTOVOLTAIC ARRAYS AND WIND TURBINES</li> <li>• EVALUATE CO-GENERATION ALTERNATIVES</li> </ul>
	REDUCE CARBON FOOTPRINT	REDUCE ENERGY CONSUMPTION PRODUCED WITH FOSSIL FUELS	<ul style="list-style-type: none"> <li>• ENCOURAGE PUBLIC TRANSIT USE WITH COMFORTABLE PEDESTRIAN CONNECTIONS TO TRANSIT AND SHUTTLE STOPS</li> <li>• PRIORITIZE PEDESTRIANS OVER CARS</li> <li>• ENCOURAGE BICYCLE USE WITH BICYCLE PATHS AND CONVENIENT STORAGE RACKS</li> <li>• CONSIDER CO-GENERATION ALTERNATIVES</li> <li>• UNDERTAKE GREENHOUSE GAS (GHG) ASSESSMENT</li> </ul>
HABITATS	PROTECT EXISTING HABITATS	INCREASE DEVELOPMENT DENSITY TO PROTECT EXISTING NATURAL AREAS	<ul style="list-style-type: none"> <li>• CONSOLIDATE DEVELOPMENT TO MINIMIZE IMPACT</li> <li>• MAINTAIN AND ENHANCE NATURAL CORRIDORS</li> </ul>
	RESTORE DAMAGED HABITAT	ENHANCE NATURAL AREAS, LANDSCAPES, AND POND AREAS	<ul style="list-style-type: none"> <li>• PROVIDE NATIVE HABITAT IN NATURAL AREAS OF THE SITE</li> <li>• MAINTAIN AND ENHANCE TREE CANOPY TO PROTECT HABITAT</li> <li>• DESIGN STORMWATER DETENTION PONDS TO SUPPORT NATIVE HABITAT</li> </ul>



# MASTER PLAN



BIRD'S EYE VIEW OF DISCOVERY PARK AT FULL BUILD-OUT, AS SEEN FROM THE NORTH

## MASTER PLAN FRAMEWORK

The Discovery Park master plan creates a framework for the development of a new research district structured around an integrated pedestrian circulation network and a shared system of indoor and outdoor public spaces. The proposed design creates a dynamic setting that facilitates casual interaction and collaboration between University and private researchers.

The framework plan organizes the site into three research precincts: the Central UNT Research Precinct with the existing building—the Central Building—which will be renovated and repurposed over time for University research and research-related graduate studies; the East UNT Research Precinct, which will contain new academic research uses sited along a new north-south pedestrian corridor (the East Mall); and the West Science and Technology Precinct, where private research enterprises will be arranged around a new Central Park. The framework emphasizes the enhancement of facilities and connections within the Central Building, as well as the integration of the two new precincts with the Central Building and the surrounding natural environment.

The developed center of the site will be surrounded by structured open spaces, including the East Mall, the Central Park, courtyards framed by buildings and other open spaces, recreation space, and natural areas for habitat and stormwater management. It will be served by existing and new parking, and areas for service and maintenance. Areas for future development will be preserved along the north and east edges of the site.

### Goals

The following goals were established for Discovery Park through the planning process, and serve as the key drivers of the master plan and design guidelines:

- Create an environment that fosters a culture of creativity, collaboration, innovation and entrepreneurship
- Integrate existing facilities to create a vibrant environment for collaboration
- Plan for flexibility, growth and private investment over the long term
- Create a locus for innovation and networking for partners in the region
- Create an attractive, bold visual identity for Discovery Park and the University
- Reinforce intellectual connections between Discovery Park and the main campus
- Create a plan that demonstrates sensitivity to the natural environment and surrounding land use patterns.

The University proposes to accommodate one half of the research activity generated by the over \$100 million in research funding anticipated by the Strategic Plan for Research 2011–2021 at Discovery Park.

This translates into a need for at least 850,000 square feet of new science and technology research space. University research and development at Discovery Park is expected to attract a significant level of private research that will result in the need for another 850,000 square feet of private research space.

The following six elements define the structure of the Discovery Park master plan:

- Program
- Open space
- Vehicular, Pedestrian and Bicycle Circulation
- Stormwater Management
- Utility Infrastructure
- Sustainability.

## Program

The University proposes to accommodate one half of the research activity generated by the over \$100 million in research funding anticipated by the Strategic Plan for Research 2011- 2021 at Discovery Park. This translates into a need for at least 850,000 square feet of new science and technology research space. University research and development at Discovery Park is expected to attract a significant level of private research that will result in the need for another 850,000 square feet of private research space.

The University may relocate academic programs currently housed in the Central Building to the main campus over time. Support uses, such as CITC, may also be relocated to free up space for research activities. These initiatives could create nearly 500,000 square feet of space in the Central Building for University research. The additional demand for research space will be accommodated in new buildings within the East UNT Research Precinct containing up to 500,000 square feet of new space. The total square footage available in these two areas will readily accommodate the proposed 850,000 square feet of space for new University research. Private research partners that move to the Park will be accommodated in new, purpose-built facilities on leased parcels in the West Science and Technology Precinct.

The first phase of development at Discovery Park will consist of a new facility that will be sited to the west of the Central Building near a cleanroom that the University plans to develop in the Central Building. The second phase will occur to the east of the Central Building. The two buildings will be designed and sited to catalyze new development within the West and East Precincts and create new gateways to those areas of the campus, as well as to the Central Building.



PEDESTRIAN GATEWAYS AND RECREATION SPACES  
WILL BE LOCATED THROUGHOUT THE SITE

- COURTYARD
- ENTRYWAY
- CAFE
- SHARED SPACE
- STUDY AREA

Table 4 summarizes the proposed Discovery Park program for research uses and the related parking requirements.

TABLE 4. DISCOVERY PARK MASTER PLAN PROGRAM

PRECINCT	PROGRAM (GSF)	SURFACE PARKING (400 SQ.FT. / SPACE)	STRUCTURED PARKING (325 SQ.FT./ SPACE)	TOTAL REQUIRED PARKING
EAST UNT RESEARCH	500,000	400	600	1000
CENTRAL BUILDING	550,000	1,100	0	1,100
WEST SCIENCE AND TECHNOLOGY	850,000	750	950	1,700
TOTAL	1,900,000	2,250	1,550	3,800



THE EAST MALL



CENTRAL PARK

## Open Space

Open space at Discovery Park will serve as a structuring, unifying element for new development and as a visual and recreational amenity for Park users. The landscape will also support ecological functions, including stormwater management. Open space will consist of several distinct spaces and typologies, as follows:

### East Mall

The East Mall will serve as the main open space in the East UNT Research Precinct and will connect all areas of the precinct. The Mall will extend from a vehicular drop-off near the existing south-eastern entrance to the Park to the northern end of the precinct. It will function as the primary pedestrian route through the precinct, and will be designed with covered walkways on either side and a linear open space in the center. The open space will also serve as a water-receiving landscape.

### Central Park

The Central Park will form the core of the West Science and Technology Precinct, to the west of the Central Building. Private research buildings will be sited around the space, framing the Park. Covered pedestrian walkways will line the northern and southern edges of the Park, adjacent to the buildings. The Central Park will serve as a recreational and visual amenity for the West Science and Technology Precinct, as well as a water receiving landscape.



OPEN SPACES WILL BE INTEGRATED THROUGHOUT THE PARK

-  NATURAL AREAS AND PERIMETER BUFFER
-  COURTYARD
-  WATER RECEIVING LANDSCAPE
-  RECREATION AREA

## Courtyards

New buildings at Discovery Park will be sited to frame a series of intimately-scaled courtyard spaces. The courtyards will be connected to adjacent pedestrian pathways and designed as outdoor gathering and resting places. The courtyards that connect the Phase One and Two buildings to the Central Building will be covered with dynamic shading devices that will increase outdoor comfort and create welcoming, interesting entrances to these gateway buildings.

## Water-Receiving Landscapes

Open spaces within the Discovery Park site will be designed to treat, channel, slow, and store stormwater. Central spaces in the East Mall and the Central Park will hold a limited amount of stormwater during storm events, with the balance of stormwater flows channeled into detention areas located in the outer corners of the Park and in the open space fronting the entrance to the Central Building entrance along the loop road.

## Natural Areas and Perimeter Buffer

Natural areas and perimeter buffer landscapes are located along the edges of the site. These will be preserved or enhanced, while providing ecological functions, such as stormwater management and native habitat.

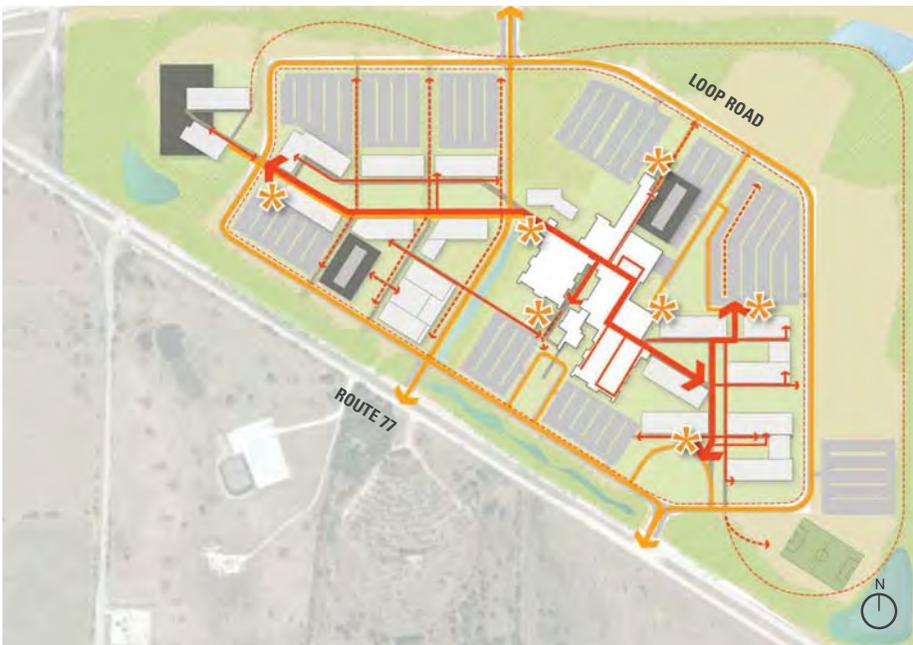
## Recreation Areas

The Discovery Park open space network will be designed to accommodate passive recreation, including walking, jogging, and cycling on a continuous network of pathways for use by the University and research park community. A recreation field will be introduced in the south-east corner of the site to further encourage outdoor recreation.



VEHICULAR CIRCULATION

- PRIMARY VEHICULAR ROAD
- SECONDARY VEHICULAR ROAD
- PARKING
- ENTRY DROP-OFFS



PEDESTRIAN CIRCULATION

- MAJOR PEDESTRIAN SPINE
- COVERED PEDESTRIAN PATHWAY
- OUTDOOR PATH
- BICYCLE PARKING

## Vehicular, Pedestrian and Bicycle Circulation

The Discovery Park circulation framework is designed to accommodate vehicles, pedestrians and bicycles in a logical and comprehensive network.

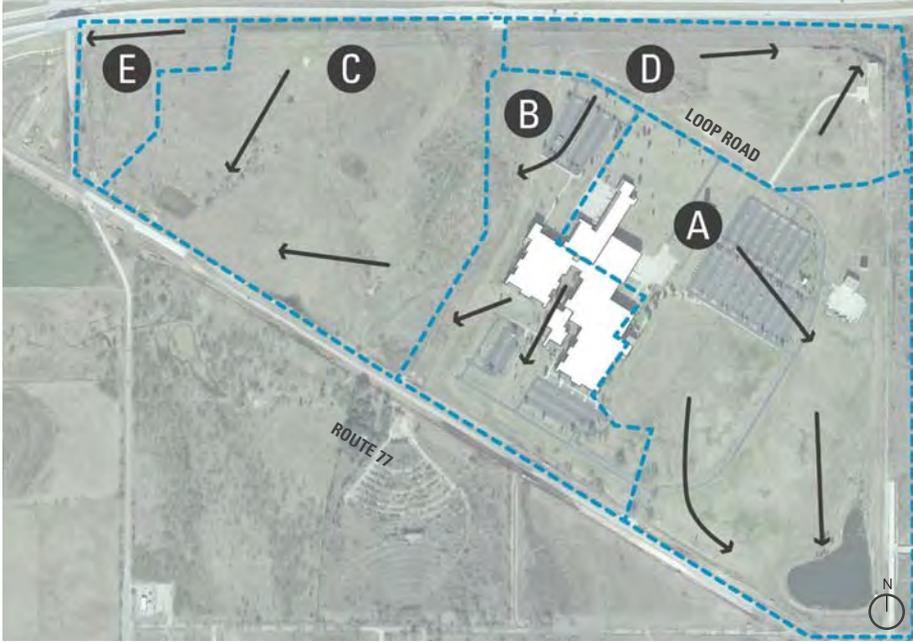
The master plan establishes two levels of gateways: vehicular gateways from Routes 77 and Loop 288 into the Park, and precinct gateways that mark the entrance to each precinct and facilitate the transition from vehicular to pedestrian realms.

Improved entrances from Loop 288 and Route 77 will create the vehicular gateways into Discovery Park and provide access to the internal road network, which will be extended to create a continuous loop through the site. A new Central Drive will connect the Loop 288 and Route 77 entrances and define the boundary between the Central Building and the West Science and Technology Precinct. Vehicular drop-off points will be established at the new precinct gateways, which define the entrance to each precinct. The gateways will be located by the existing Discovery Park entrance from Route 77, at the existing entrance to the Central Building, along Central Drive between the Central and West Science and Technology Precincts, and at the west end of the West Precinct along Loop Road.

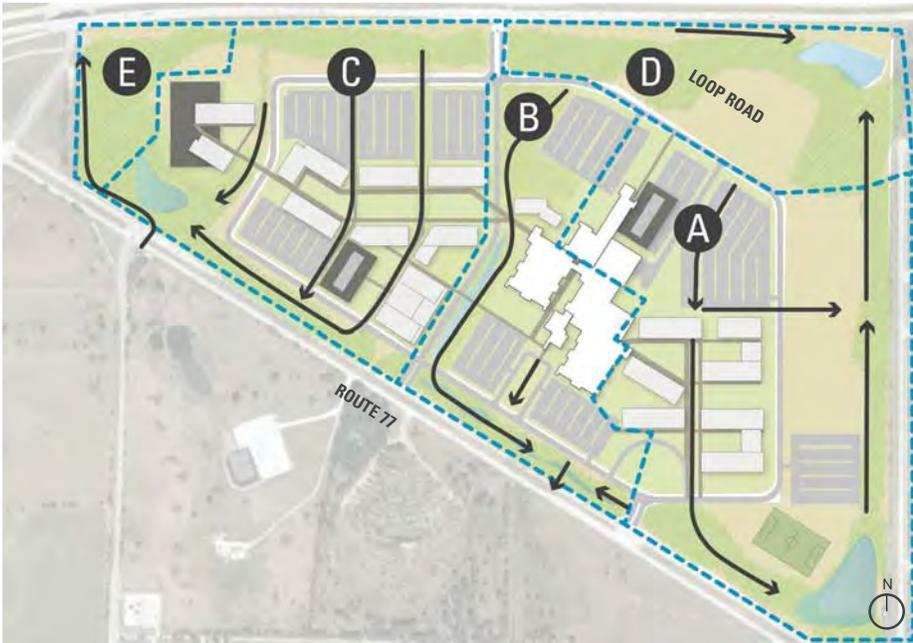
Primary vehicular circulation will occur along Loop Road, which will provide access to parking structures and lots. The proposed re-alignment of portions of Loop Road increases the potential for contiguous development within the ring road. Vehicle routes are intended for users of the Park, and may require signage to carry through-traffic. Parking will generally be located inside the loop, with some additional parking designed to serve new development in the East Precinct located along the eastern edge of the site outside the Loop Road.

Five precinct gateways will provide access to Discovery Park's pedestrian network. The gateways will be located at the northern and southernmost ends of the East Mall, the eastern and western ends of the Central Park, and at the main entrance to the Central Building. The Central Building's existing double-height corridors will serve as the principal organizing element of the pedestrian network, providing access to and connecting all areas of the site. The double-height corridors will be extended to the Phase One and Two buildings as two-story glass-enclosed walkways on the outside of those buildings. Beyond these buildings, a system of covered walkways will extend the pedestrian network to the East Mall in the East Precinct, the Central Park in the West Science and Technology Precinct, and to secondary pathways. Covered walkways will link all new development and facilitate pedestrian navigation of the site in all weather. Shaded courtyards will connect walkways and building entrances. Clearly defined pedestrian routes will be provided through parking areas to the gateways and building entrances.

A shared bicycle and pedestrian pathway will be introduced just inside Loop Road and beside Central Drive. To encourage bicycle access to the site, bicycles will also be allowed on most pedestrian walkways. Bicycle racks will be provided adjacent to all main building entrances.



EXISTING WATERSHEDS



PROPOSED STORMWATER MANAGEMENT NETWORK

- WATERSHEDS
- DRAINAGE

## Stormwater Management

Stormwater on the Discovery Park site will be managed through a sustainable, highly visible surface network of basins, channels, swales, fields and ponds designed to slow, filter, store, infiltrate and release stormwater run-off. The network will disperse stormwater over the site, maintaining naturally functioning ecosystems, while reducing the need for engineered components, as well as the size of detention ponds. It will also mitigate flood events and improve the quality of water flowing from the site.

The stormwater management system is an integral part of the landscape framework. In the East UNT Research Precinct, stormwater will drain from building roofs to adjacent courtyards, and flow to a channel within the center of the East Mall. The channel will carry the water to the south under Loop Road, into a swale that connects to the existing east detention basin. The courtyard landscapes and swales will infiltrate and filter much of the water as it moves through the system.

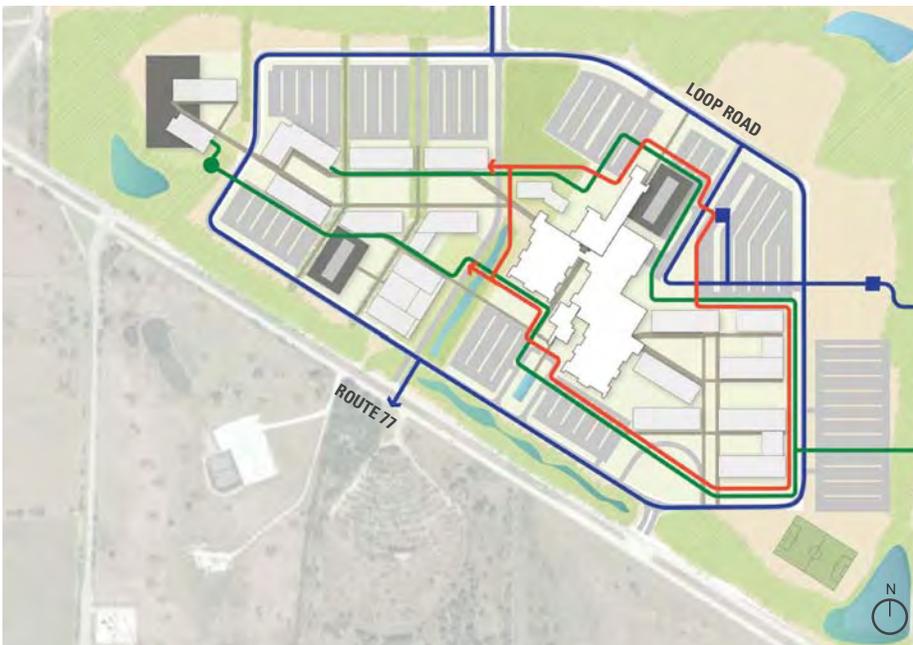
Within the West Science and Technology Precinct, stormwater will drain from building roofs to a garden zone around the Central Park, where it will be filtered before flowing into the sunken Central Park lawn area. The lawn will be designed to detain water in minor storm events.

Swales in several north-south "green fingers" will convey stormwater from the parking lots in the north area of the site through the Central Park and south parking lots into a swale that connects to an expanded detention pond in the southwest area of the site. A major swale in the natural area between the Central Building and West Science and Technology Precinct drains south to a swale between Loop Road and Route 77. The stormwater detention ponds, located at the three low corners of the site, will be planted with native shrubs and trees so that they may function as habitat for native species and as a visual amenity.



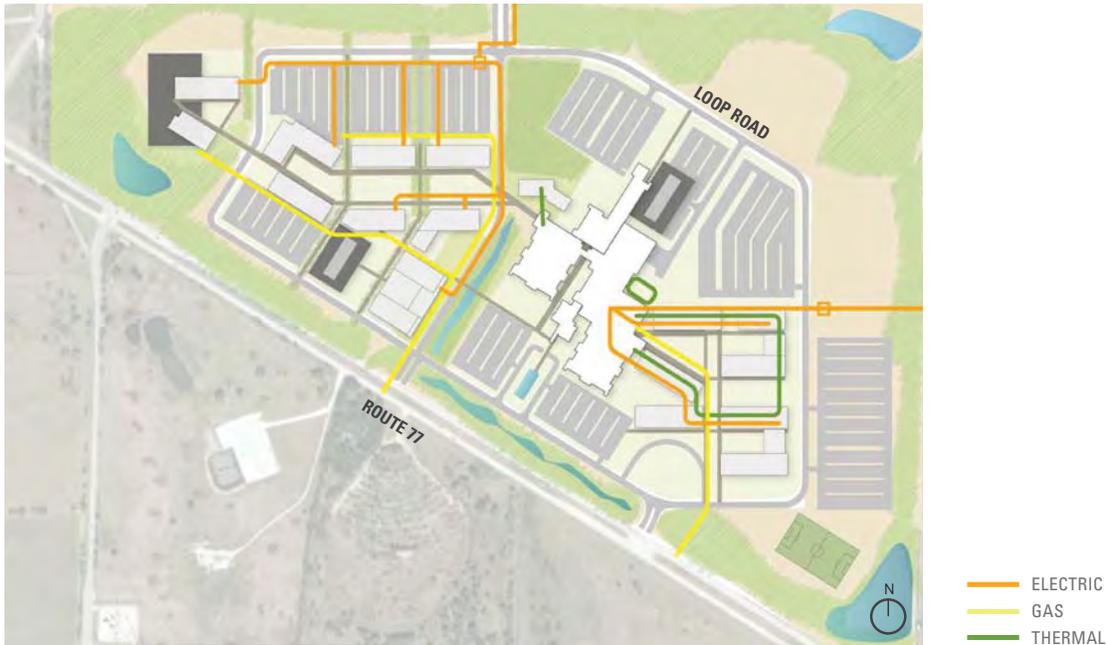
- STORM DRAIN
- WATER
- SEWER
- FIRE MAN PROTECTION
- ELECTRIC
- GAS
- CHILLED WATER

EXISTING UTILITIES



- STORM DRAIN
- WATER
- SEWER

PROPOSED WET UTILITIES AT BUILD-OUT

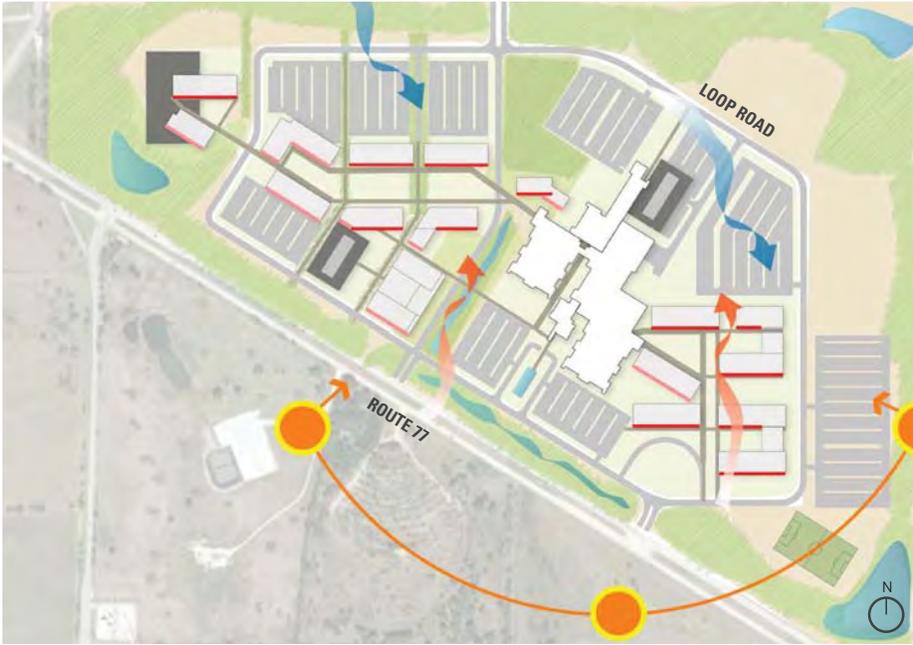


PROPOSED DRY UTILITIES AT BUILD-OUT

## Utility Infrastructure

The master plan development strategy proposes to use existing utilities during the first phases of development and to relocate utilities into corridors over the long term. On-site drainage will also be redesigned to allow for increased stormwater mitigation and development of water-receiving landscapes.

The Phase One and Two buildings will connect to the existing utility infrastructure. Water-receiving landscapes will also be created. Subsequent development will also connect with the existing utility infrastructure and further extend the water-receiving landscape. Over the long-term (20 years or more), new buildings developed at the north termination of the East Mall will occupy sites containing utility systems remaining from the original TI development, which will need to be relocated. At this stage, existing utility infrastructure will need to be replaced, and will be placed into corridors. The need to pipe stormwater off site will be dramatically reduced over time, with the introduction of water-receiving landscapes and on-site stormwater treatment systems.



SUSTAINABLE SOLUTIONS IN BUILT FORM



SUSTAINABLE SOLUTIONS IN THE LANDSCAPE

-  SUN PATH
-  OPTIMAL ORIENTATION
-  GOOD ORIENTATION
-  NORTHERN WIND
-  SOUTHERN BREEZE
-  SHADED CORRIDOR
-  COURTYARD
-  PARKING GARDEN
-  GREEN SPINE
-  DETENTION POND
-  STORMWATER FLOWS

## Sustainability

Sustainability is advanced in all aspects of the master plan, comprehensive site, architectural and landscape guidelines, and utility infrastructure recommendations.

The master plan orients buildings with their long sides face east-west in order to maximize interior daylighting throughout the year. The optimal building alignment for solar orientation is 2.5 degrees off cardinal east-west, making this the most practicable orientation for development. The plan also sites buildings so that cooling summer breezes, which come from the south, are channeled through the Park along open spaces that are oriented north-south. The East Mall and central landscape spine in particular will direct these breezes through the Park. Cold winter winds from the northwest will be diffused by a consistent, sheltering northern built edge and open spaces that do not channel those winds.

Stormwater will generally be routed from the north, where the site is higher, to the south along landscape spines and into water-retaining landscapes and water retention ponds. Water will also be channeled along the edges of the site to the ponds. Water flows will be kept above ground when possible to maximize natural stormwater treatment, to provide a visual amenity, and to reduce operations and maintenance costs.

The plan introduces landscaped areas at regular and frequent intervals in parking lots to reduce the heating effects that occur over large stretches of asphalt, reduce the impact of impermeable parking surfaces, shade and cool cars and pedestrians, and provide a visual amenity. Allees of trees will line both sides of Loop Road and Central Drive, providing the same amenity as the trees in the parking lots. Courtyard spaces between buildings are conceived as cool, green oases which will provide recreation space for Park users, habitat areas for wildlife, and water retention areas. The perimeter areas of the Park will be preserved and enhanced as natural areas that will serve as additional recreation and habitat areas.



PRECINCTS



THE MASTER PLAN ORGANIZES DISCOVERY PARK INTO THREE PRINCIPAL RESEARCH PRECINCTS: THE CENTRAL UNT RESEARCH PRECINCT CONTAINING THE CENTRAL BUILDING, THE EAST UNT RESEARCH PRECINCT AND THE WEST SCIENCE AND TECHNOLOGY PRECINCT.

## MASTER PLAN PRECINCTS

The master plan organizes Discovery Park into three principal research precincts: the Central UNT Research Precinct containing the Central Building, the East UNT Research Precinct and the West Science and Technology Precinct. Each of the three precincts will have distinct programs, major open spaces, and physical design characteristics. The master plan also describes the treatment of areas outside of the precincts, which are designated as natural or flexible use areas, recreation areas, or for future research park expansion.

**The master plan organizes Discovery Park into three principal research precincts: the Central UNT Research Precinct containing the Central Building, the East UNT Research Precinct and the West Science and Technology Precinct.**

The Central Building will be a nucleus of research and social activity at Discovery Park.

## Central UNT Research Precinct and Central Building

Because of its original function as a Texas Instruments production facility, the existing Discovery Park building is somewhat imposing and opaque in appearance. Inside, the primary pedestrian corridors are wide, double-height spaces, which create a strong organizational structure to the pedestrian network and draw light into the building. However, deep floor plates make internal navigation from the primary network less intuitive and limit the potential for natural light. In order to transform the existing complex into an energizing setting for science and technology research, renovations should focus on improving connections through the building, increasing openness and internal daylight levels, and improving transparency between the indoor and outdoor environments. In addition, strong, clear connections to new development within the East and West Precincts should be established to improve pedestrian flows through the building and across the Park.

### Program

The December 2009 Smith Group space analysis and planning report provides near-term guidance on the re-use of existing space for the Colleges of Engineering and Information, and other academic programs and administrative uses currently located in the Park. These improvements are intended to make more efficient use of the building for its current occupants. Once new space is created on the main campus or other location for these uses, the Central Building will be dedicated to UNT research or research-related graduate studies, together with shared support amenities, and administrative functions. This will create nearly 500,000 square feet of new research space in the building.

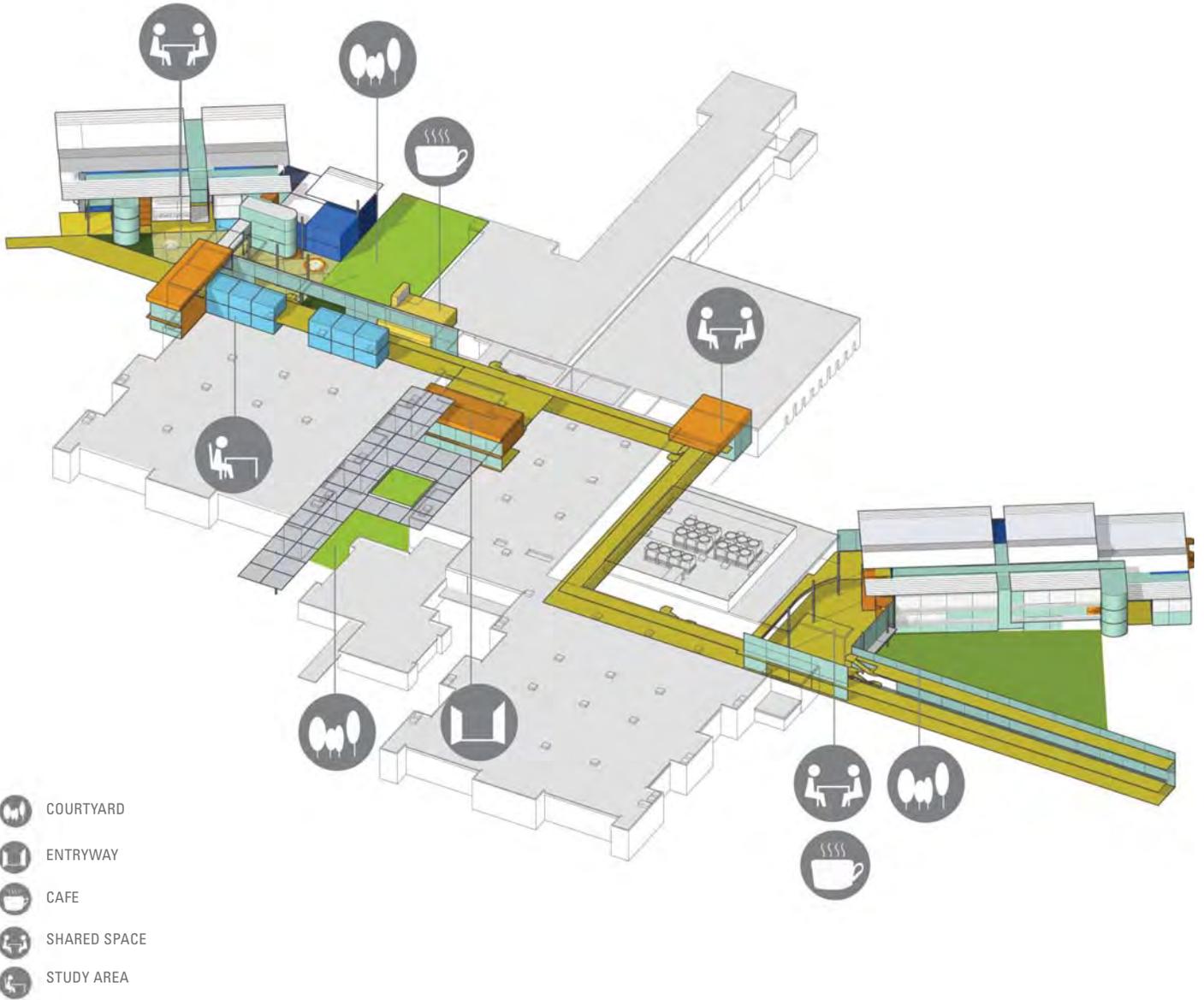
### Open Space and Landscape

The master plan proposes to build on the two existing courtyards within the Central Building to create a more attractive and accessible open space setting that is better integrated with the landscape surrounding the building. The courtyard at the main entrance to the building will be enhanced with additional plantings and paved areas with seating. Access to a new clean room to be developed in this part of the building will be coordinated with the design of the entrance. Direct, tree-lined pedestrian pathways will be created to connect adjacent parking and vehicular drop-off areas to the building's doors within the courtyard spaces. Gridded bosques, maintained lawns, and possibly large-scale sculptures will be used to create a formal sense of arrival. Additional courtyards could be introduced in parts of the building with deep floor plates to bring light and greenery into the interior of the building.

The landscape surrounding the Central Building will be a native savannah of tall grasses and scattered groups of trees. Higher maintenance, irrigated landscapes will be kept to the interior of the Park, and at major pedestrian entrances, such as at the existing main entrance into the Central Building. A major swale will run to the west of the building. Views into the landscape from the Phase One building will be oriented towards this new landscape.

THE CENTRAL BUILDING ENTRANCE WILL BE RENOVATED TO LEAD DIRECTLY INTO THE HEART OF THE BUILDING ►





THE CENTRAL BUILDING WILL BE THE HOME OF MANY SHARED PARK AMENITIES



## Pedestrian Circulation

The master plan proposes to build on the Central Building's existing double-height corridors as the principal organizing element of the Discovery Park pedestrian circulation system. Within the building, the corridors will be enhanced to create clear pedestrian connections to different zones and use areas. Improved secondary pedestrian routes extending from the primary corridors will enhance access into deep floor plates. All pedestrian routes will be defined with special, repeating visual elements to strengthen orientation. The double-height corridors will also extend past the walls of the Central Building and connect it to the Phase One and Two buildings.

THE EXISTING CIRCULATION SYSTEM WILL BE ENHANCED THROUGH INCREASED DAYLIGHTING AND IMPROVED ACCESS INTO DEEP FLOOR PLATES.

## Vehicular Circulation, Parking and Service

Vehicular access to the Central Building will occur through a new entrance along Central Drive, and from enhanced entrances on the north and south sides of the building. The entrances will be defined by vehicular drop-off areas that lead directly to adjacent parking. Parking will be supplied mainly in surface lots located on either side of the building, and in a future four-story parking structure on the north side of the building that will meet the demand for parking as new science and technology research functions are located on the site over time.

Service to the Central Building will continue to occur from the service court located at the northeast corner of the building, next to the utility plant.



## East UNT Research Precinct

The East UNT Research Precinct will be a dense, walkable district centered on a new East Pedestrian Mall, which will also function as the principal open space element within the Precinct. The East Mall will be designed as a landscaped corridor with shaded pedestrian walkways framed by new research buildings sited along its length. It will extend from a new southern campus gateway, consisting of a plaza and vehicular drop-off area, to a new research building at its northern terminus. A second plaza will be created at the intersection of the East Mall and Central Precinct corridor system.

Buildings along the Mall will be sited in courtyard arrangements, and will be oriented east-west for optimal solar control and access to southern breezes in the summer. They will be connected by the shaded pedestrian walkway system.

### Program

Up to 500,000 square feet of new University research space will be developed in the East UNT Research Precinct over time. Buildings will range in size from 60,000 to 100,000 square feet, and will be three-to-four stories or 36 to 48 feet in height. The Phase Two building will be the first building in the Precinct.

### Open Space and Landscape

The East Mall will be a linear open space extending from a new southern campus gateway and entrance plaza to a new research building at its northern terminus. It will be 100 feet wide, and will consist of two parallel shaded pedestrian walkways that flank adjacent buildings. The center of the Mall will contain a linear open space designed to carry stormwater flows that will facilitate drainage during storm events. The open space will be planted with shade trees and attractive native shrubs, flowers, and grasses.

The new plaza at the vehicular drop-off to the Mall will serve as the primary pedestrian gateway into the Precinct. A second plaza will be created at the intersection of the Mall and Central Precinct corridor system. The plaza will serve as the entrance to the Phase Two building, and will provide access to the Central Building's double-height pedestrian corridor system. Other buildings along the Mall will be arranged to frame individual courtyards, which will each contain a stormwater collection landscape feature, shaded seating areas, and beds planted with native plants, shrubs and trees.



EAST MALL AS SEEN FROM A SECOND-STORY CORRIDOR

The north-south orientation of the Mall will allow for summer breezes to flow through the space, creating a more hospitable outdoor environment. The Mall's central landscape will be designed with a consistent vocabulary to create a unified sense of place and enhance wayfinding through the Precinct. The central landscape will include a channel that lies slightly below the grade of adjacent buildings and pathways to receive and convey stormwater to a swale that connects to the existing detention pond in the southeast corner of the Discovery Park site.

### Pedestrian Circulation

The East Pedestrian Mall will serve as the principal organizing element of the pedestrian circulation network. Covered walkways will connect new buildings the length of the Mall, creating a shaded outdoor environment that will encourage pedestrian use. East-west bridges will cross over the central landscaped channel to connect buildings. Secondary pedestrian connections will lead from the covered walkways to building entrances within adjacent courtyards.

### Vehicular Circulation, Parking and Service

Vehicular circulation, parking and service access to the East Precinct will occur via the existing loop road network and the new vehicular drop-off area created at the entrance to the Mall. Most parking will be located to the north of the Precinct, with additional parking to the south by the Central Building. Service access will be provided to buildings at the east edge of the Precinct from Loop Road, and from the parking lots to the north of the Precinct.



## West Partnership Precinct

The West Partnership Precinct will consist of a group of individually developed research parcels, surrounding a shared Central Park to the west of the Central Building. Buildings and pedestrian circulation will frame this central open space, which will be the defining feature and unifying element of the Precinct. The main entrance to the West Partnership Precinct will occur via a vehicular drop-off along the new Central Drive, and a secondary drop-off at the western edge of the Central Park. Parking will be provided inside Loop Road and will consist of surface lots and a four-level parking structure, which will be needed as the Park develops over time. Buildings in the West Partnership Precinct will be arranged to frame the edges of the Central Park. A plaza between the West Partnership Precinct and the Central Precinct will facilitate a shift in grid, so that new buildings sited around the Park may be placed in an east-west orientation for optimal solar control.

The plan preserves a site for a free-standing building to the west of the Central Park. The site will be separated by a natural open space corridor, and will be highly visible from Loop 288. Given its prominent location, a taller landmark building up to eight stories in height could be developed on this site.

### Program

Up to 850,000 square feet of new private research space will be developed in the West Partnership Precinct. Buildings will range in size from 100,000 to 200,000 square feet, and will be three or four stories in height in most locations, with some buildings as tall as eight stories on prominent sites, such as the western landmark site.

## Open Space and Landscape

The Central Park will serve as the primary open space element in the West Science and Technology Precinct, and will define this area of the Discovery Park site. The park will consist of a large rectangular sunken lawn designed for active and passive recreational use, and to hold stormwater during storm events. The lawn will be surrounded by a continuous, single-story covered walkway offset from the edges of buildings lining the park. The areas on either side of the walkway will consist of a densely planted garden zone designed to receive and filter roof runoff before it reaches the central sunken lawn.

Green fingers consisting of shared pedestrian and bike pathways, allees of trees for shade, and stormwater drainage swales will extend from the West Science and Technology Precinct's parking areas, between buildings, and into the Central Park. The areas where the green fingers pass between buildings will be designed as entry plazas and gathering areas.

## Pedestrian Circulation

A single-story covered pedestrian walkway system will extend around the Central Park space fronting the edges of the buildings lining the park. The walkway will be designed to carry pedestrian and bicycle traffic from parking areas, between buildings, and into the Park. Primary building entrances will be oriented towards the Central Park.

## Vehicular Circulation, Parking and Service

Vehicular access to the West Science and Technology Precinct will occur via Loop Road.



THE CENTRAL PARK WILL PROVIDE THE OPPORTUNITY FOR CASUAL MEETINGS AND RECREATION



FLEXIBLE USE AREAS

The new Central Drive will lead to a vehicular drop off area. Another vehicular drop-off will be located on the west side of the Central Park. The western drop off will provide access to the landmark building site across the landscaped corridor that separates the site from the Central Park. Parking will be provided in surface lots surrounding the buildings. A four-story structured parking facility will be located to the south of the Precinct, providing additional parking capacity as demand warrants. The landmark building will be served by its own parking structure sited to its west.

Service to all buildings in the West Science and Technology Precinct will be provided from the surface parking lots that surround the buildings built around the Central Park.

## Recreation Areas

The master plan introduces a recreation field or basketball court to the southeast of the East Precinct as an amenity for the Discovery Park site. Passive recreation will be accommodated in the East Mall, Central Park and courtyard areas. Pedestrian and bike pathways throughout the site will provide additional opportunities for outdoor activity.

## Flexible Use Areas

The master plan defines several flexible use areas on the site, which will accommodate agricultural research initiatives and a variety of interim functions over the short-term, and serve as land reserves for research park expansion over the long-term. The flexible use areas are located east of Loop Road in the northeast portion of the site, and adjacent to the east property boundary.

Because agricultural research is a major research cluster initiative for UNT and is growing significantly, supporting these initiatives is an important priority. It is anticipated that a new greenhouse complex could consist of 20,000-40,000 square feet. Utility infrastructure will need to be added or enhanced to support the growth of these research initiatives. Additional surface parking could be introduced in the area to the east, if needed.

The master plan does not illustrate a more detailed site plan for these areas. Given the potential diversity of uses they may contain, it is anticipated that the areas will be integrated with the balance of the Discovery Park through landscape and open space treatment. University uses will be significantly set back with appropriate landscaping to shield neighborhoods from new development. In particular, some uses such as service yards or outdoor storage areas for research equipment may require significant screening to preserve the quality of the research park environment and adjacent neighborhoods.

Access to flexible areas will occur via driveways from Loop Road.



THE PHASE ONE BUILDING WILL BE BUILT TO THE WEST OF THE CENTRAL BUILDING



THE PHASE TWO BUILDING WILL ANCHOR THE EAST UNT RESEARCH PRECINCT

## UNT Land North of Loop 288

This master plan focuses on the land south of Loop 288; however the University will need to consider potential uses for its landholdings north of Loop 288. It is recognized that the northern parcel may be of value in the future for spin-off companies, business or light industrial development that is related to activities in Discovery Park.

## Phasing

Development of the Discovery Park site and buildings will be phased as UNT's research agenda evolves and funding becomes available. The West Science and Technology Precinct will be developed incrementally as private partners are attracted to the Park, and lease individual sites.

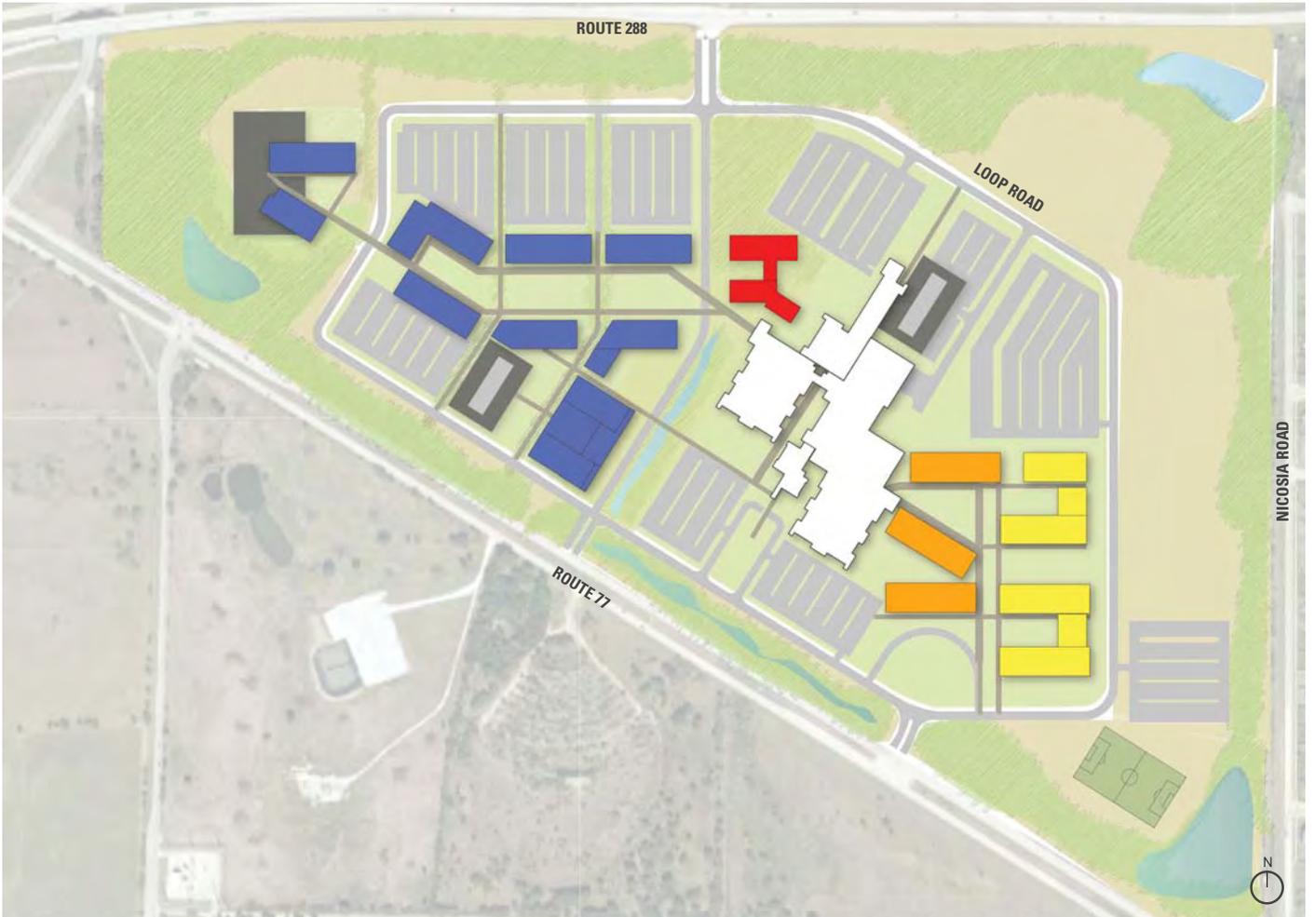
### Phase One

The first phase of development at Discovery Park will begin in the near future with the University's plans to develop a new building in accordance with the Strategic Plan for Research. The first building—the Phase One building—will be an Interdisciplinary Science and Technology facility that will support interdisciplinary research focused around science, engineering, and pharmacy. The building will be sited immediately to the west of the Central Building, where it will be close to a new clean room the University plans to develop in repurposed space in the Central Building. The location of the new research building has the potential to encourage private investment within the West Science and Technology Precinct by companies seeking access to the clean room and CART.

The Phase One building will be connected to the Central Building via an enclosed pedestrian corridor. The space framed between the new building, the new walkway, and the existing cafeteria will serve as an outdoor gathering and dining space for the Discovery Park community. It will also form part of the new gateway serving the Central and West Science and Technology Precincts via a new vehicular drop-off from Central Drive, although construction of the new drive is not required to facilitate development of the building. A landscape finger to the west of the Central Building will be included as part of the first phase for stormwater collection and conveyance purposes.

As part of the first phase, the current primary entrance and courtyard at the southern façade of the Central Building will be reconfigured to create a more direct entrance to the building with an improved landscape. The entrance will lead directly into to the Central Building's primary pedestrian circulation system with clear connections and access to the two new buildings.

The Phase One building will be sited to make use of the existing vehicular and utilities infrastructure, so that new roads, parking lots, or utility lines will not be required during the first phase of development.



PHASING

- PHASE 1
- PHASE 2
- PHASE 3
- PARTNERS DEVELOPMENT

## Phase Two

Phase Two will begin with a new research building on the east side of the Central Building to accommodate additional University research activity. It is expected that the new building will catalyze further development of academic research within the East Precinct, while also establishing the first phase of the East Mall. The Phase Two building will be directly connected with the Central Building's pedestrian network through an enclosed pedestrian walkway. Subsequent buildings in Phase Two will be sited along the west side of the East UNT Research Precinct. This strategy will facilitate the development of the west side of the East Mall, and will allow for the ongoing use of the existing utility systems.

The Phase Two building will also be sited to make use of the existing vehicular and utilities infrastructure.

## Phase Three

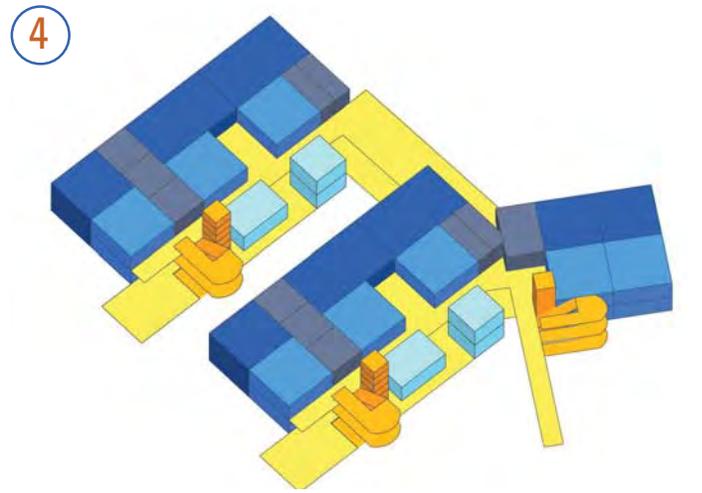
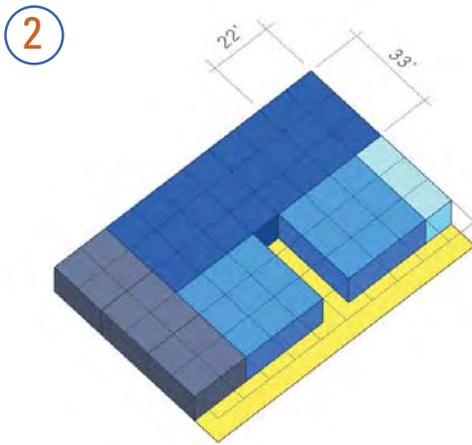
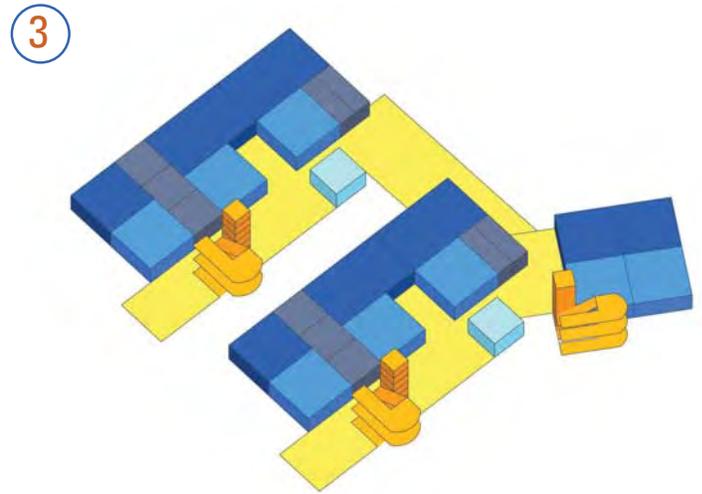
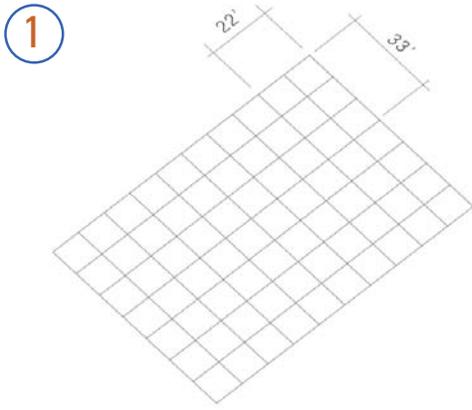
Phase Three will involve the development of the east side of the East Precinct and the completion of the East Mall, associated driveways and parking. Development of buildings within in the northeast portion of the Precinct will require the relocation of utilities into corridors. This will occur in the long-term where existing utilities will be close to the end of their functional life.

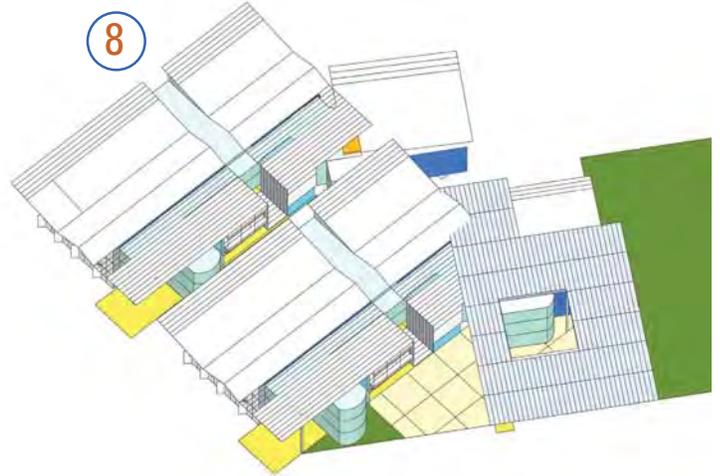
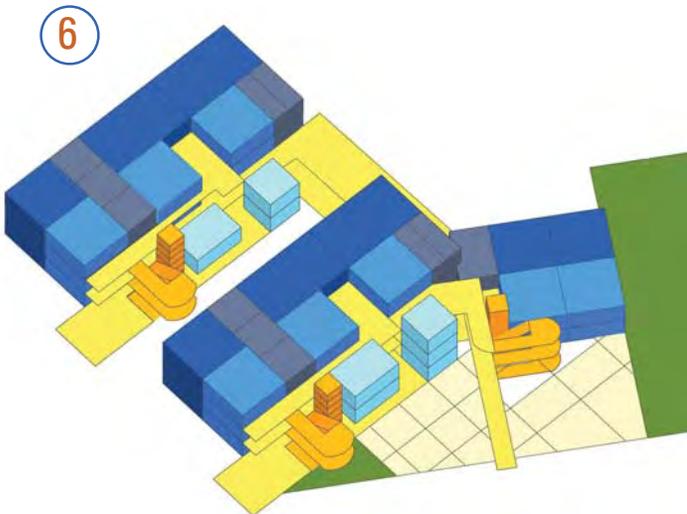
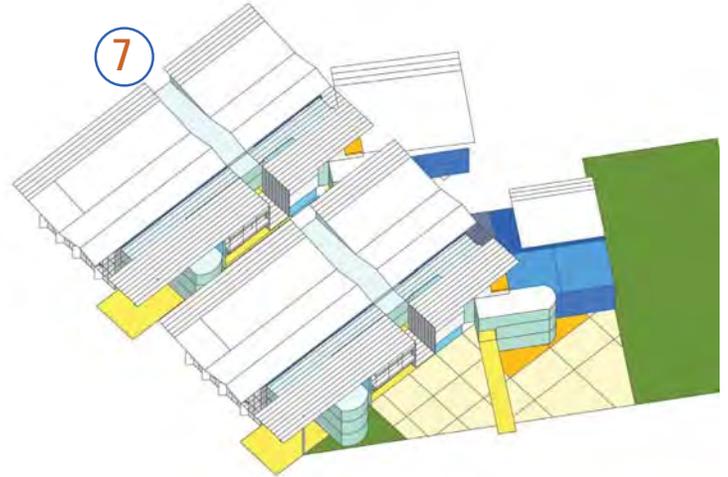
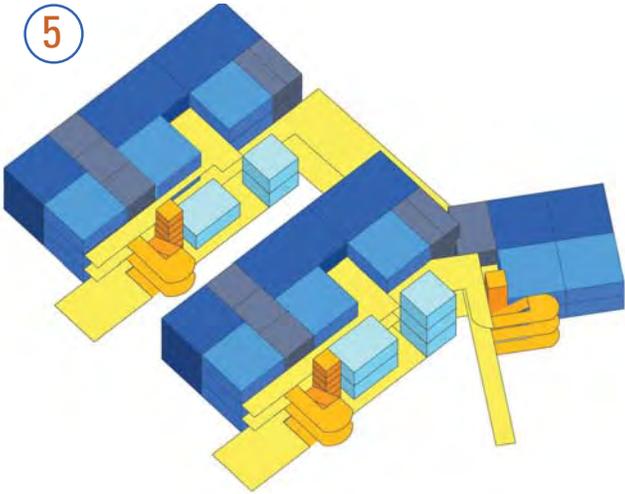
## Utility Capacity

As designed, there is sufficient capacity on municipal electric line for existing and proposed UNT electric demand. However, to support future development within the west portion of the site, a potential municipal upgrade will be required, as well as a new electrical grid connection.

A sanitary lift station will be required to service the westernmost West Partnership Precinct building given the location and grades of the site in that area. The total estimated average daily sanitary sewer flow is 100,000 Gallons Per Day (GPD).

The total estimated average daily water demand is 175,000 Gallons Per Day.





LABORATORY BUILDINGS IN DISCOVERY PARK MAY BE DESIGNED USING FLEXIBLE LABORATORY BUILDING BLOCKS. THESE BUILDINGS COULD BE LOCATED IN BOTH THE EAST UNT RESEARCH PRECINCT AND THE WEST SCIENCE AND TECHNOLOGY PRECINCT.

- LAB
- LAB SUPPORT
- OFFICE
- MECHANICAL
- CIRCULATION
- STAIRS
- COURTYARD
- GREEN SPACE



# GUIDELINES



**DISCOVERY PARK** University of North Texas

# GUIDELINES

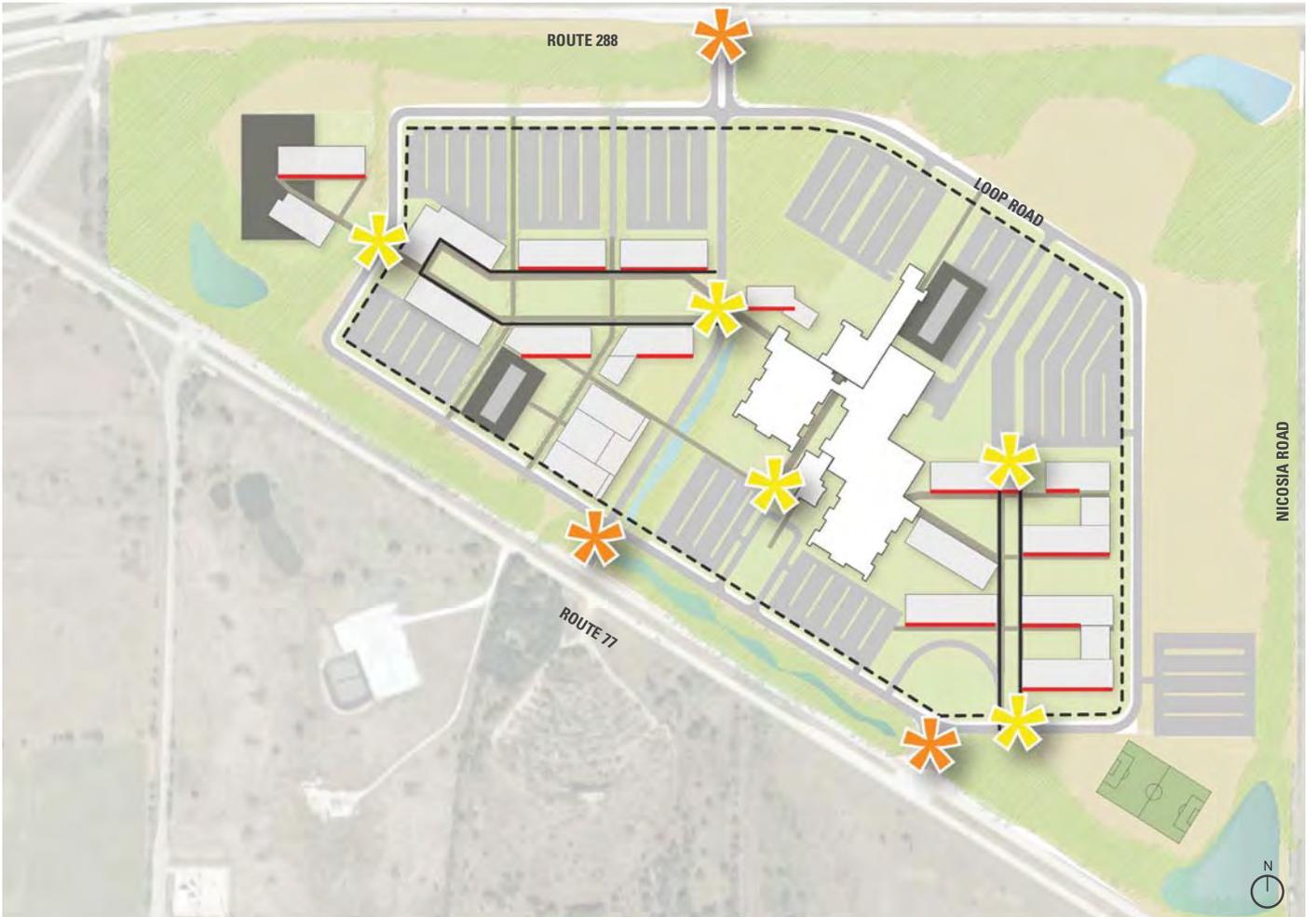
The following urban design guidelines provide a general design framework for all areas of the Discovery Park site. The guidelines are intended to establish a truly pedestrian-scaled campus environment that supports and encourages interaction between people, and to set the parameters within which development can occur on the site. The guidelines direct the location and design of new facilities, as well as the retrofitting of existing facilities, in order to establish a coherent aesthetic and efficient organization of site elements.

## Campus Design Guidelines

### Principles

The campus design guidelines are founded on several key principles, and address such subjects as the relationship between precincts, building orientation, setbacks, building height and massing, ground level treatments and entrances for all areas of the site. The key principles are as follows:

- Establish a dynamic pedestrian environment consisting of three integrated precincts: the Central UNT Research Precinct, the East UNT Research Precinct, and the West Science and Technology Precinct
- Site buildings to create pedestrian scale, shaded courtyard spaces between or within individual buildings, which serve as outdoor rooms
- Establish visual connections between the inside and outside environments
- Create strong visual and physical transitions between multiple levels in Park buildings
- Develop new and shared pedestrian spines to ensure connectivity and promote interaction and collaboration across the Park
- Locate shared amenities in clusters along these pedestrian routes to establish nodes of activity



ENTRANCES, ORIENTATIONS, BUILD-TO LINES AND SETBACKS

-  VEHICULAR ENTRANCES
-  PEDESTRIAN ENTRANCES
-  OPTIMAL ORIENTATION
-  BUILD-TO-LINES
-  SETBACKS

## Building Orientation and Placement

Buildings should be oriented with the long axis east-west when possible for optimal solar orientation. Buildings or building segments may be oriented north-south to achieve urban design objectives, such as framing a street or pedestrian area, but such orientations should be minimized. In these cases, façade treatments and shading devices should compensate for suboptimal orientation.

Where new development shifts from the Central Building grid to the proposed east-west orientation, interesting and dynamic plaza and courtyard spaces should be created and oriented to take advantage of the unique geometry created by the shifting grid of buildings.

## Points of Arrival

Vehicular and pedestrian arrival points to Discovery Park provide an opportunity to create a strong sense of arrival and demarcate the gateways of the Park. Gateways should be clearly identified with signs that reflect the importance of the entrance. For example, the signs at the main vehicular entrances to the Park from Routes 77 and Loop 288 should be sculptural, unique and significant, while secondary entrances may have smaller signs.

The experience for employees and researchers arriving from parking areas behind each building is as important as the primary gateway experience for visitors to the Park. Secondary pedestrian entrances into the different precinct areas should employ simple, repeating elements, such as canopy shade trees, to create a comfortable, attractive sense of arrival.

Primary building entrances within the Park should be oriented towards the main public open spaces, including the East Mall and Central Park. Secondary building entrances should open onto individual courtyard spaces, more intimate private spaces, and parking areas.

## Ground Level Treatment

Ground floors should contain the most active and public uses. In all buildings, transparent materials should provide appropriate visual access into these areas, particularly along building facades adjacent to pedestrian walkways.

The ground floor should be located at grade when facing a public plaza or primary open space in order to reinforce the physical and visual connections between the interior and exterior of the building.

## Setbacks and Build-to Lines

The plan introduces a 30-foot setback of buildings from Loop Road and parking lots to allow for a landscape buffer. The plan also introduces a 30-foot setback of parking lots from Loop Road.

Build-to lines on the north and south edges of the Central Park in the West Science and Technology Precinct will define and maintain a consistent 200-foot width for the Central Park. Build-to lines on the west and east edges of the East Mall in the East UNT Research Precinct will define and maintain a consistent 100-foot width of the central landscape feature.

Within the East and West Precincts, a minimum of 30 percent of a building façade along roads or pedestrian walkways should conform to the established setback line. Unarticulated facades should not exceed 80 feet before they must step back or forward at least five feet for a minimum of 15 feet.

Building canopies may extend nine feet beyond the building line or façade. Canopies should be consistent with the materials and architectural expression of the building. Other building projections, such as balconies or floor projections, may extend up to six feet beyond the building line or façade for no more than 30 percent of the length of the facade.

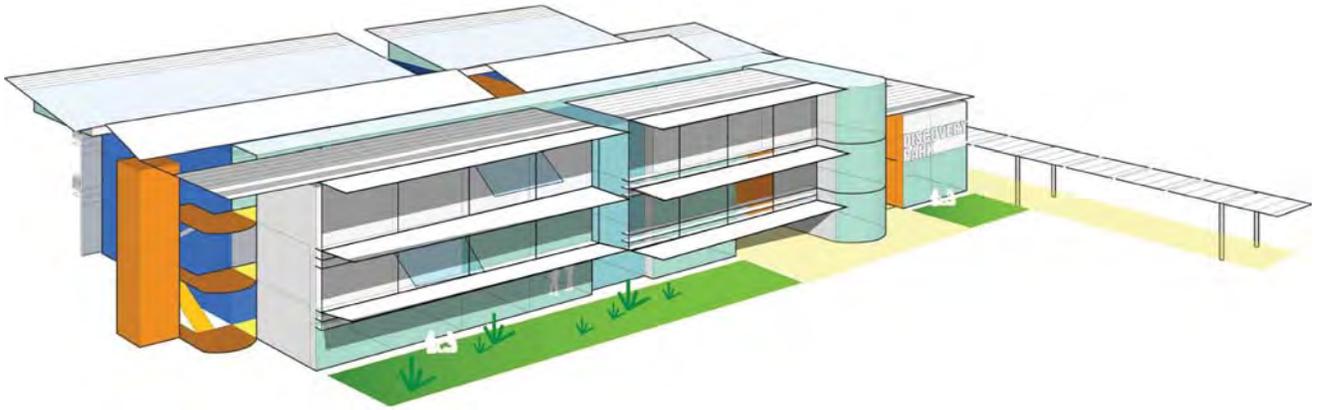
## Height and Massing

Buildings should establish a pedestrian scale and define adjacent open spaces with a three to four story height. External shading devices are encouraged on building elevations to filter direct sunlight, avoid internal greenhouse effects, and allow controlled natural light into buildings. Canopies and shading devices should extend over sidewalks to shade pedestrians.

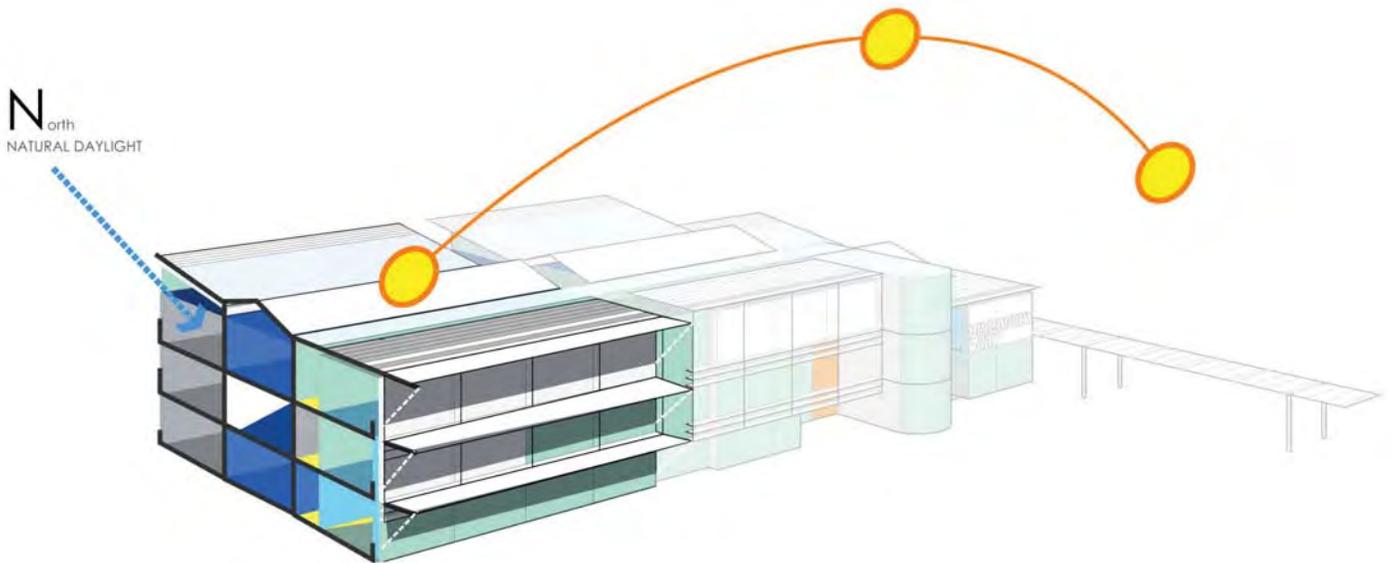
In the East Precinct, buildings shall be three stories in height. Small accent features that vary from this rule are allowed covering not more than 20 percent of the building footprint.

In the West Science and Technology Precinct, buildings must have a base height of three to four stories, and may rise above that height at landmark locations.





A MODULAR LAB BUILDING OF THE TYPE THAT COULD BE DEVELOPED AT DISCOVERY PARK



BUILDINGS SHOULD RESPOND TO THE LOCAL ENVIRONMENT

# Architectural Design Guidelines

## Principles

The architectural design guidelines for the Discovery Park site are based on the following principles:

- New buildings should employ a simple, modern design aesthetic to create a new image for Discovery Park, while also responding to the scale and context of the existing building.
- Architectural character should be informed by contemporary sustainable building practices, materials, and technologies, as well as the North Texas vernacular and climate.
- Buildings across the site should promote transparency between indoor and outdoor environments, establish a pedestrian scale, and define adjacent open spaces with a three-to-four-story height or base limit.
- Lobbies should be well lit using natural light, exhibit clear signage, and provide a feeling of openness and welcome.

## Central UNT Precinct

The existing building at Discovery Park (the Central Building) has the potential to become a unique and vibrant space with its large scale, high ceilings, and double-height corridors and bridges. The interior “street” is a defining feature of the building which should be enhanced by replacing blank walls with window walls and adding skylights to bring in additional daylight. In order to maximize the potential of the street and the building’s primary network of public space, special amenities and gathering areas with comfortable seating should be introduced to create a more animated pedestrian experience.

The primary entrance should be relocated to the north side of the central courtyard at the heart of the Central Building. This move will improve the experience of arrival at Discovery Park which is currently circuitous and difficult to navigate. It will create an inviting walk through the shaded courtyard, as well as access to the core and most active part of the building.

The Central Buildings’ existing courtyards and ground level treatment should be enhanced. Visual connections between the indoors and outdoors are currently limited, so consideration should be given to replacing dark window glazing with light glazing and shading systems in appropriate areas to increase transparency. Over time, tinted glass in entryways and on the ground level surrounding courtyards and adjacent to pedestrian routes in particular should be replaced with shaded transparent glass to increase openness.

## East UNT Research Precinct

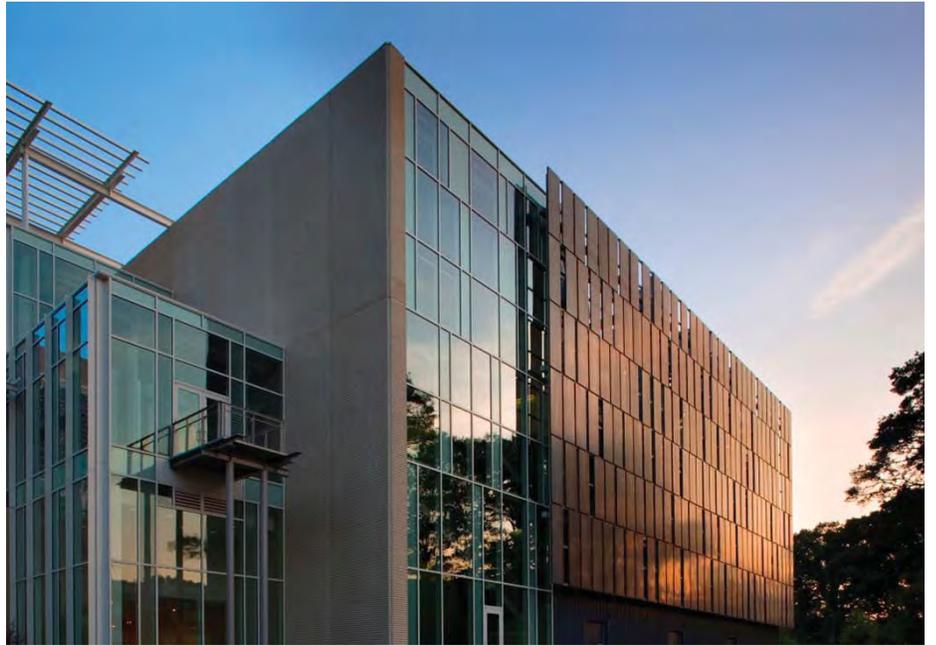
The architecture in the East UNT Research Precinct should reflect both its research functions and its ties to the University. Architecture should respond to the structure, function and orientation of the East Mall. The architecture in this precinct will be characterized by contemporary simplicity and transparency, creating a strong sense of innovation and 21st Century science and technology research.

## West Science and Technology Precinct

Buildings in the West Science and Technology Precinct will be stand-alone facilities built by a range of private research and technology entities and developers. As a result, there will be greater variety in building form and expression than in the East Precinct, reflecting individual corporate identities. Buildings will be tied together by complementary color and building material palettes, while the comprehensive site design guidelines and the landscape character will create a cohesive sense of place.

The design of the interiors in each precinct should incorporate amenities to support research-related activities, including multi-purpose facilities and social, dining, and recreational spaces.





FACADES SHOULD ADMIT DAYLIGHT AND PREVENT EXCESSIVE HEAT GAIN

## Entrances

Primary building entrances should be oriented towards the primary pedestrian circulation routes, and secondary building entrances should open onto less public courtyard spaces and parking areas. Clear sightlines should be created between internal corridors and outdoor spaces. Lobbies should be well lit using natural light, exhibit clear signage and provide a feeling of openness and welcome.

## Facades and Fenestration

Façade treatments should reflect the overall context and orientation of the precinct in which the building is located. At least 70 percent of the ground floor façades that face pedestrian paths should be transparent glass between heights of three and seven feet.

Building facades should have a clear expression of base, middle and roof through detailing and choice of materials. Facades should be carefully designed to respond to their orientation and employ appropriate treatments to minimize heat gain. Where appropriate, internal building activities should be made visible through the use of glass to increase the sense of vibrancy and connection to the Park. Mirrored and darkly tinted glass is discouraged. Glass should be adequately shaded by architectural shading devices and by trees and landscape elements.

## Covered Walkways

The master plan introduces a system of covered pedestrian walkways to connect all areas of the Discovery Park site. Shade structures should be visually light and elegant and integrated with the architectural style of each precinct. Overhead screening and shading elements may be used to shelter pedestrians and buildings from the summer sun and to create a dynamic play of shadows on walkways and building facades.

In the East UNT Research Precinct, shaded pedestrian walkways that create a strong sense of connection between indoor and outdoor environments should tie the district together and connect it to the Central Precinct on both the ground and second floor levels.

In the West Science and Technology Precinct, a system of covered walkways that is disconnected from but adjacent to buildings will help define the edges of the Central Park space and provide a sheltered pathway for pedestrians to access building entrances.



EXAMPLES OF SHADING STRUCTURES



ROOFS AND SHADING DEVICES SHOULD BE PROVIDED ON SOUTHERN FACADES

## Roofs

Roof coverings should be light, neutral in tone, or reflective to reduce heat island effects and operations costs. Vegetated roofs are encouraged to improve the energy performance of buildings and contribute to stormwater management. Roof overhangs should be expressive and provide shade to building façades when the sun is directly overhead. Photovoltaic and solar heating units should be considered as rooftop elements. In accordance with Texas State requirements for roofs 10,000 square feet or greater, runoff from rooftops should be captured and reused or gradually released to natural treatment systems.

## Building Materials

Locally sourced materials are preferred for all building purposes. Permitted materials include local brick and limestone, metal and glass, with colors to be approved by the Design Review Board that will oversee development of the Discovery Park site (see Governance, below). Mirrored and darkly tinted glass should be avoided, and where possible, replaced during renovations. The use of materials that have tactile qualities, such as wood, should be used sparingly to lend interest and scale to places such as entrances where people come in contact with the building.

## Service Buildings

Service buildings should adhere to the simple, contemporary aesthetic of the Park. Aspects like window shading and façade details should be used to make these buildings visual assets for the Park. Where possible, buildings should be used to shield site infrastructure and equipment.

## Mechanical Screening

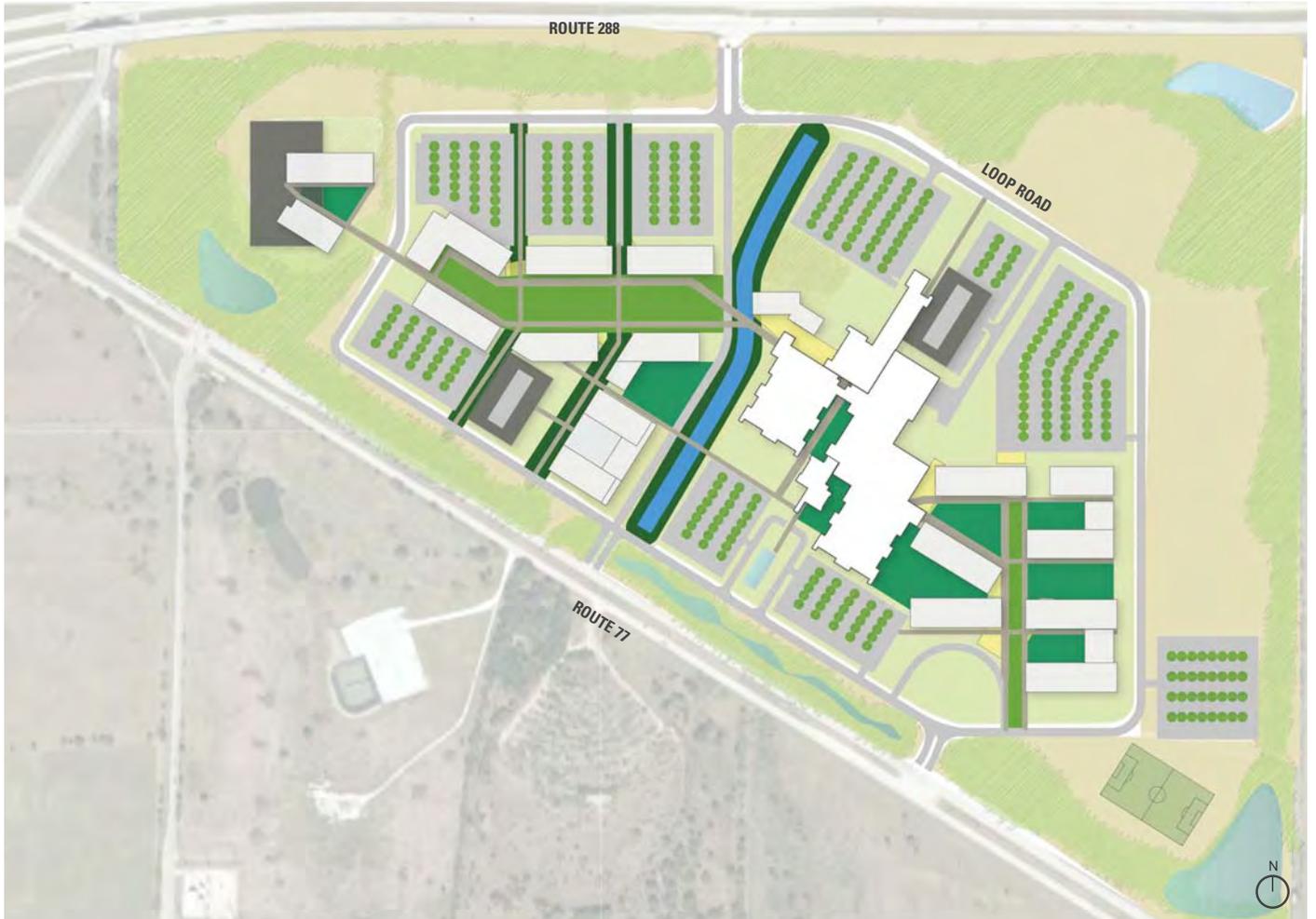
Mechanical equipment should be concealed by vegetated or architectural screens, or set back from view of adjacent properties, buildings, pedestrian walkways, open spaces, roads, or other public spaces. All rooftop equipment should be painted or coated with an appropriate color to blend in with rooftop materials and minimize visual impacts.

## Parking Structures

The master plan introduces two parking structures to accommodate convenient parking and allow for considerable density of program in the future. Parking structures will be four stories high, with parking on the top level shaded under shade structures or solar arrays. Parking structure design should be compatible with the adjacent precinct architecture, and provide adequate visual screening of cars. Where parking structures face onto pedestrian spaces, façade treatments should be carefully designed and of high architectural quality.



ENTRY PLAZA IN THE EAST UNT RESEARCH PRECINCT



LANDSCAPE TYPOLOGIES

-  WATER-RECEIVING COURTYARDS
-  PARKING GARDEN
-  PLAZA
-  PRIMARY GREEN SPACE
-  GREEN FINGERS
-  PRIMARY PEDESTRIAN CIRCULATION
-  CENTRAL BIOSWALE
-  DRY SAVANNAH
-  PERIPHERAL LANDSCAPE
-  MEDIUM MAINTENANCE LANDSCAPE
-  DETENTION POND

## Landscape Design Guidelines

### Landscape Design Principles

The following landscape design principles provide for the creation of an outdoor environment in keeping with the vision for the Park and the goals of the master plan:

- Provide visually clear, continuous, shaded pedestrian routes through the site
- Configure buildings to create usable small-scale, shaded courtyard spaces
- Collect, store and reuse stormwater on site
- Provide open areas for community and research park users and recreation
- Create a unified, attractive, ecologically functional outdoor environment
- Preserve and enhance a low-maintenance, native landscape in the undeveloped areas of the site
- Employ ecological initiatives to reduce operations costs

### East Mall

The East Precinct's East Pedestrian Mall will consist of a network of covered pedestrian walkways that tie buildings in this precinct together. Openness and visual connectivity will be emphasized across and along the Mall. The open space will be planted with shade trees and attractive local shrubs, flowers, and grasses.

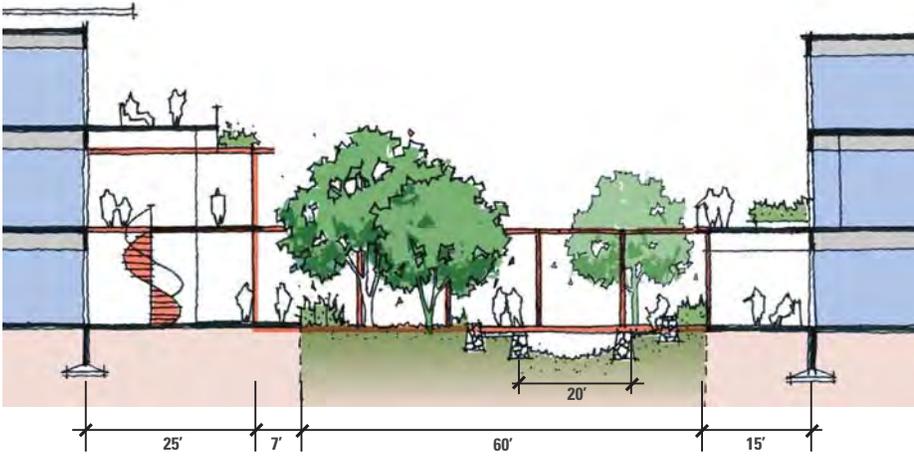
### Central Park

The West Science and Technology Precinct's Central Park will be bordered by a network of covered walkways that tie the buildings in this precinct together and define the shared park space. The park will consist of a large rectangular sunken lawn designed for active and passive recreation. The lawn will be surrounded by attractive local vegetation.

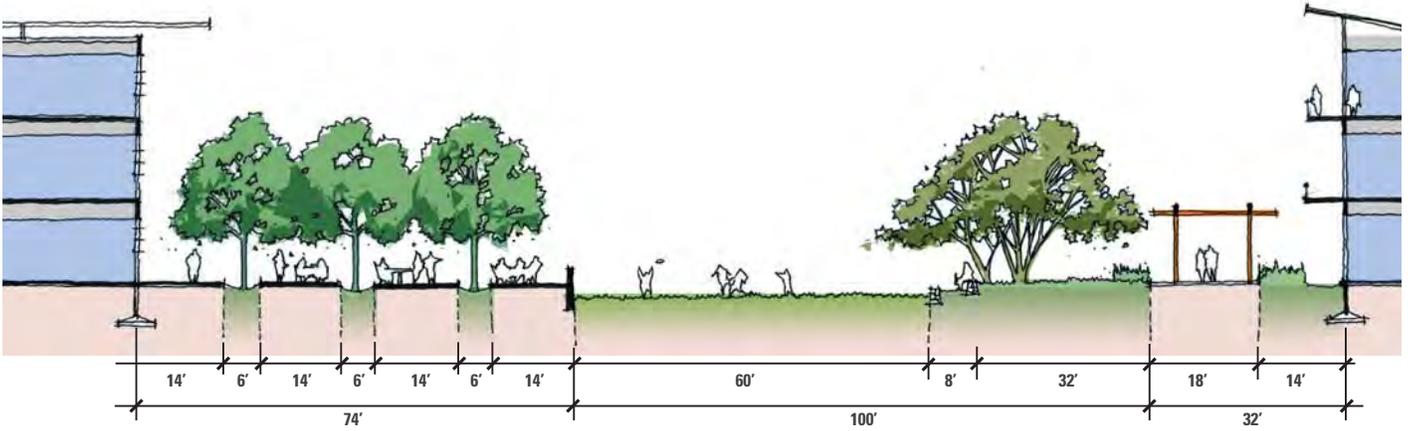
## Pedestrian Pathways

A two-level enclosed pedestrian walkway will connect the Phase One and Two buildings to the first and second levels of the Central Building, extending the Central Building's internal circulation system. These walkways will be 15 feet wide. Single-story covered pedestrian walkways at the core of Discovery Park, including main pathways in the East Mall and around the Central Park, should be a minimum of 15 feet wide, while other covered walkways throughout the park can be 10 feet wide. Pedestrian pathways should be paved using permeable concrete or permeable pavers to facilitate stormwater management.

The landscapes adjacent to pedestrian pathways should be more formal and maintained than other landscapes on the site. Plantings should include native and locally appropriate herbaceous material, shrubs, and trees, which should be irrigated using drip irrigation for the first two years after planting to promote the establishment of strong root systems.



EAST MALL SECTION



CENTRAL PARK SECTION



PROPOSED COURTYARDS AND PATHWAY NETWORK



PEDESTRIAN WALKWAYS, COURTYARDS, AND WATER RECIEVING LANDSCAPES CAN BE COMBINED TO CREATE VIBRANT, INTRIGUING SPACES

### Courtyards

Building courtyards will provide shaded seating opportunities for outdoor dining, working, and resting. The courtyards will consist of appropriately scaled paved areas for outdoor gathering adjacent to major building entrances, as well as landscape areas planted with native herbaceous material, shrubs and trees. Building facades framing the courtyards should be as transparent as possible to encourage connectivity between indoor and outdoor environments. Courtyards will be designed to collect and convey stormwater to the Central Park or East Mall. Courtyards may be designed to recycle and display stormwater in basins as a visual amenity. Courtyard paving materials may include peastone, sand, permeable concrete, permeable pavers, local stone, and other sustainable, durable materials.



### Recreation Areas

Native trees should be planted on the southern edge of the recreation field to provide a shaded area for players. Consideration should be given to drawing field irrigation from collected stormwater being stored in the nearby collection pond.





NATURAL AREAS

## Natural Areas and Buffers

A low-maintenance, native Post Oak savanna of grasses and scattered trees should be developed and preserved in the undeveloped areas of the site. Where possible, habitat for native species should be protected by maintaining existing tree canopies. Recreation trails will be provided through the natural areas along the perimeter of the site.

Naturalistic tree plantings should be concentrated along the perimeter of the site to enhance natural ecosystems, create a green backdrop for campus views, and screen service areas.

## Water Receiving Areas

Each landscape within the park should be designed as part of an overarching, connected stormwater management system. Attractive landscapes should also be created within the developed area of the site that can accommodate people and function as part of the stormwater management system. Stormwater management should be decentralized where possible, and infiltration should be promoted to the extent possible given local soil conditions. Stormwater detention areas should be designed to provide habitat for native and migratory species, and serve as visual amenities for Discovery Park.

## Service Yards

Service yards should be screened from pedestrian and vehicular circulation routes with screen walls or vegetation. Service yards should incorporate stormwater management features such as oil separators, catch basins or vegetated landscape filters to filter and infiltrate storm water.

## Gateways

The master plan establishes two levels of gateways: vehicular gateways from Routes 77 and Loop 288 into the Park, and precinct gateways that mark the entrance to each precinct, and facilitate the transition from vehicular to pedestrian realms.

Vehicular gateways should consist of two lanes, separated by a planted median. Vehicular gateways should employ a repeating rhythm of formal, large-scale landscape elements, such as allées of trees, site walls, street lights and signage to create an inviting entry sequence. Gateway signage at new vehicular entrances should clearly announce the arrival to the Park.

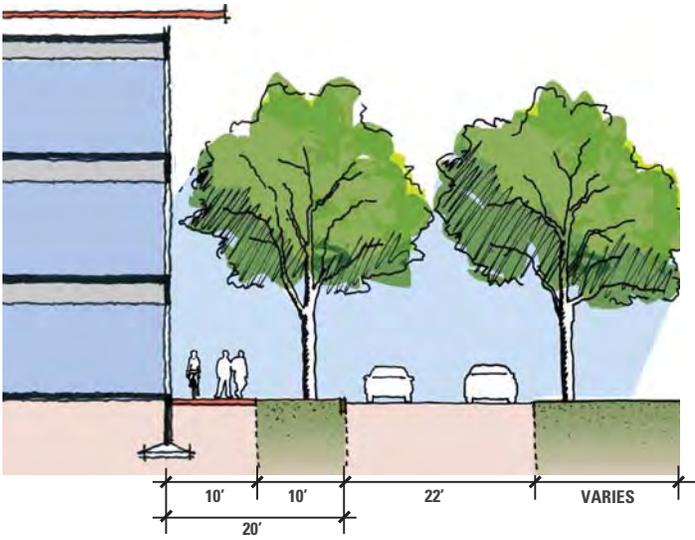
The vocabulary of design elements at the precinct gateways should transition to a pedestrian scale. Pedestrian-scaled lights, a richer palette of vegetation, wayfinding signage, and architectural elements, such as covered walkways, should invite pedestrians into the interior of the Park.



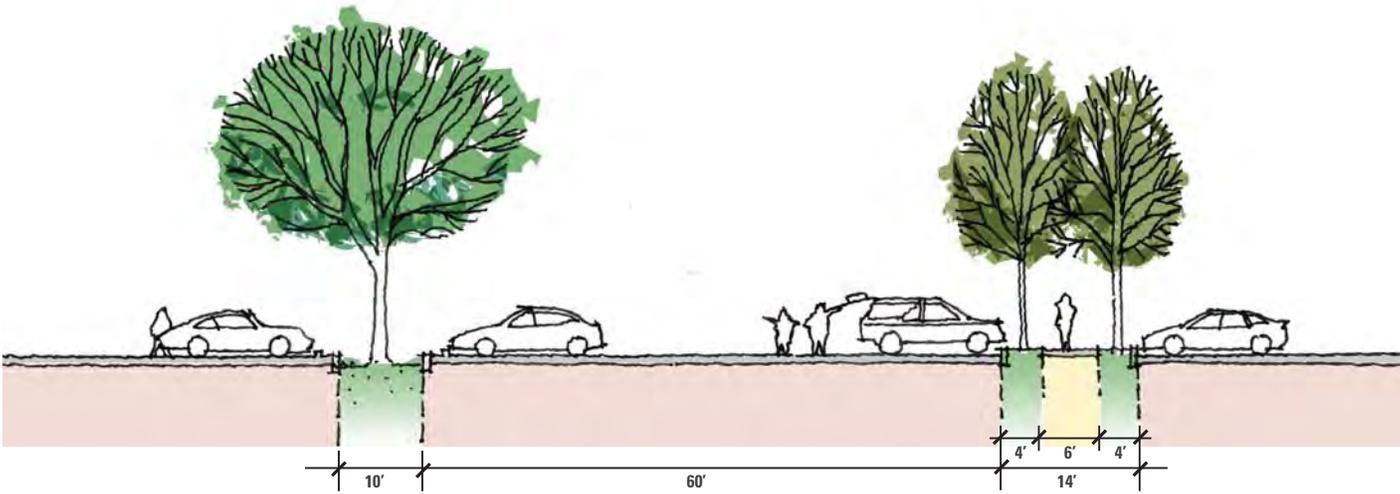
COLLECTED WATER CAN BE USED TO CREATE  
DRAMATIC OR REFLECTIVE SPACES



PEDESTRIAN WALKWAYS SHOULD BE PROVIDED  
THROUGH PARKING AREAS



SECTION THROUGH LOOP ROAD



SECTION THROUGH TYPICAL SURFACE PARKING LOT

## Loop Road

The partially constructed loop road that currently provides access to the Central Building allows for easy circulation, loading, service and drop-off on the site, and will be extended as the primary site circulation route. Shuttle and public transportation drop-off should be located along Loop Road at the termini of the primary pedestrian spines.

The master plan design for Loop Road proposes a 22 foot pavement width, with two eleven-foot travel lanes. The outer edge of the road will not have a curb but will be lined with an allée, while the inner edge will be designed with a continuous curb, planted allée, and shared pedestrian/ bicycle path.

## Central Drive

The master design for the new Central Drive also proposes a 22-foot pavement width with two eleven-foot travel lanes. The road will be lined with an allée of trees. The east edge of the road will not have a curb, while the west edge will be designed with a continuous curb and shared pedestrian and bicycle path.

## Driveways

Driveways are required in several areas of the Discovery Park site to provide access to buildings for service and loading. To ensure that pedestrians have priority in all areas of the site, sidewalks should be provided along driveways and through parking lots to connect to major pedestrian destinations. Driveways should be as narrow as possible, while still accommodating the service and loading requirements of each building. This economy in paving will reduce heat island effects, enhance the pedestrian environment, and minimize impermeable surfaces.

## Parking

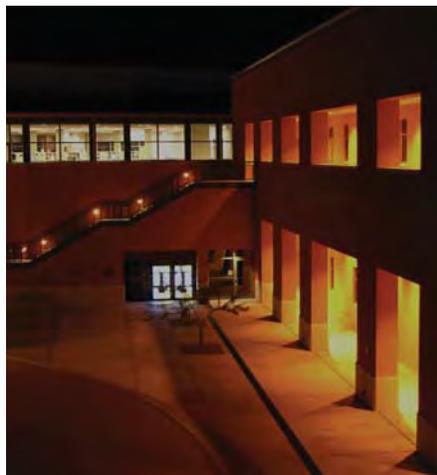
Surface parking lots are a major source of urban heating and contaminated runoff, as well as negative pedestrian experiences. To mitigate these impacts, drainage swales and tree planting strips should be incorporated into surface parking areas to create more intimately scaled "parking gardens". Vegetated landscape filters should be incorporated to treat and infiltrate stormwater. Safe, shaded pedestrian routes should be provided through all lots.

## Bicycle Circulation

Primary pedestrian routes off vehicular roads should be designed to accommodate both pedestrians and bicycles where appropriate, with careful attention to avoid conflicts between bicycles and pedestrians. Bicycle racks should be provided on paved surfaces adjacent to building and parking structure entrances, contiguous to walks or plazas. Bicycle racks should be covered to protect bikes from rain.



PEDESTRIAN SCALE LIGHTING



CUT-OFF LIGHTING KEEPS THE NIGHT SKY DARK



SOLAR-POWERED LIGHTING

## Grading

Developed areas of the site should be graded to allow for universal access. Unnecessary grading and compaction of site soils with grading equipment should be minimized.

## Lighting

A hierarchy of lighting levels should correspond to the varying levels of activity and need throughout the Park. Pedestrian-scale pole lights should be used to illuminate pedestrian walkways to provide a safe environment, and to aid in creating a unified palette of landscape elements. Vehicular-scale pole lights should be used in all parking lots and streetscapes. Accent lighting should be employed in courtyard spaces between new buildings, and to highlight primary building entrances. Entrances should be highlighted using feature lighting.

All lights should be cut-off fixtures that meet or exceed Dark Sky guidelines.

## Walls and Site Furnishings

Seating, screen walls, and outdoor furnishings should be stylistically and materially consistent with the character of each precinct. Outdoor furnishings should be considered an integral part of architectural and site design, and should be accounted for with the development of each building. Durable, contemporary landscape furniture should be located adjacent to building entrances as appropriate.



CONTEMPORARY OUTDOOR FURNISHINGS



DISCOVERY PARK SHOULD BE PLANTED WITH REGIONALLY APPROPRIATE SPECIES



### Plant Selection

Low-maintenance plant material appropriate to the region and microclimates within the site should be selected. The following are recommended species.

## RECOMMENDED PLANT SPECIES

SCIENTIFIC NAME	COMMON NAME
<b>TREES</b>	
CARYA ILLINOENSIS	PECAN
CELTIS LAEVIGATA	SUGARBERRY
CELTIS OCCIDENTALIS	HACKBERRY
CERCIS CANADENSIS VAR. TEXENSIS	TEXAS REDBUD
CHILOPSIS LINEARIS	DESERT WILLOW
DIOSPYROS TEXANA	TEXAS PERSIMMON
FRAXINUS TEXENSIS	TEXAS ASH
JUGLANS NIGRA	BLACK WALNUT
JUNIPERUS ASHEI	ASHE JUNIPER
PLATANUS OCCIDENTALIS	SYCAMORE
PROSOPIS GLANDULOSA	HONEY MESQUITE
PRUNUS MEXICANA	MEXICAN PLUM
QUERCUS MACROCARPA	BUR OAK
QUERCUS MUEHLENBERGII	CHINKAPIN OAK
QUERCUS SCHUMARDII	SCHUMARD OAK
QUERCUS STELLATA	POST OAK
QUERCUS VIRGINIANA	LIVE OAK
SAPINDUS SAPONARIA VAR. DRUMMONDII	WESTERN SOAPBERRY
SOPHORA AFFINIS	EVE'S NECKLACE
ULMUS CRASSIFOLIA	CEDAR ELM
UNGNDIA SPECIOSA	MEXICAN BUCKEYE
VITEX AGNUS-CASTUS	VITEX
<b>SHRUBS</b>	
ABELIA GRANDIFLORA	ABELIA
BERBERIS TRIFOLIOLATA	AGARITA
CAESALPINIA GILLIESII	BIRD OF PARADISE
CALLICARPA AMERICANA	AMERICAN BEAUTYBERRY
COTINUS COGGYGRIA	SMOKETREE
ILEX DECIDUA	POSSUMHAW
ILEX VOMITORIA	YAUPON HOLLY
LANTANA URTICOIDES	TEXAS LANTANA
LEUCOPHYLLUM FRUTESCENS	TEXAS SAGE
MAHONIA TRIFOLIOLATA	AGARITA
PUNICA GRANATUM	POMEGRANATE
RHAPHIOLEPSIS INDICA	INDIAN HAWTHORN
SALVIA GREGGII	AUTUMN SAGE
SALVIA REGLA	MOUNTAIN SAGE
SOPHORA SECUNDIFLORA	TEXAS MOUNTAIN LAUREL
YUCCA ALOIFOLIA	HARD YUCCA
YUCCA PARVIFLORA	RED YUCCA
<b>VINES</b>	
BIGNONIA CAPREOLATA	CROSSVINE
CAMPSIS RADICANS	TRUMPET VINE
LONICERA ALBIFLORA	WESTERN WHITE HONEYSUCKLE
<b>GROUNDCOVERS</b>	
MUHLENBERGIA LINDHEIMERI	LINDHEIMER MUHLY
MUHLENBERGIA LEUCANTHUM	SEEP MUHLY



GOVERNANCE



ENTRYWAY TO THE CENTRAL PRECINCT

# GOVERNANCE

## Development Covenants

As the University moves forward with the development of Discovery Park, it is recommended that covenants and future land uses in the surrounding context be the subject of more detailed development controls. Prior to commencing development within the Park, the University should adopt covenants that clearly articulate the parameters and guidelines for occupancy and construction. The covenants should address the following, at a minimum:

1. Park Governance
2. Development Review and Approval Process
3. Permitted Land Uses
4. Site Development
5. Landscape Design and Maintenance
6. Site Grading and Stormwater management
7. Signage
8. Exterior Lighting
9. Building Design and Construction
10. Water, Sewage and Solid Waste
11. Electricity, Telecommunications and Security Systems
12. Environmental Standards (governing such factors as electromagnetic emissions, nuisance factors and hazards)

## Design Review Procedures

The following recommendations provide a structure for the administration and maintenance of the Discovery Park master plan and design guidelines, and for the creation of a design review process.

### Design Review Board

Administration of the Discovery Park master plan is the responsibility of the UNT system. To ensure high design quality development and adherence to the master plan and design guidelines, the Chancellor should appoint a Design Review Board (DRB) to oversee development of the Park. The structure and administration of the DRB will mirror that of the DRB on the main UNT Denton campus. The central tasks of the DRB shall be:

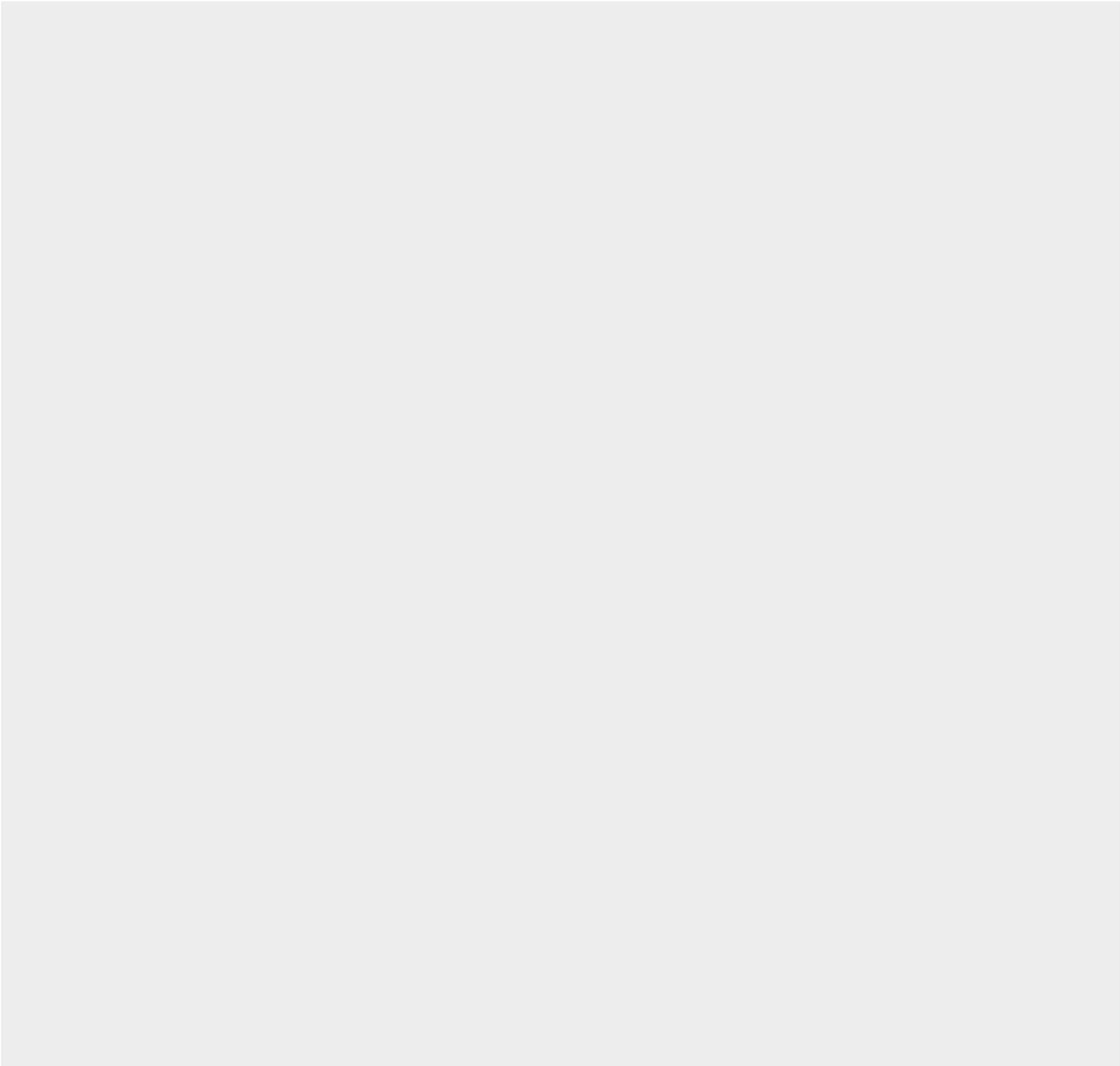
1. Interpreting the plan in greater detail where necessary
2. Reviewing proposed projects to insure compliance with the plan
3. Setting design standards of high quality
4. Involving key user departments from the Park
5. Developing short and long term implementation strategies

Design review should be triggered by any project that effects or modifies a building's siting, appearance, or interior or exterior public spaces. Such projects include site or landscape development, new construction, building retrofits, and renovations. An abbreviated administrative process can be used for projects costing less than \$50,000, although they must still be reviewed.

When reviewing a project, the DRB should consider the project's impact on site sustainability, quality, and the configuration of open space and landscape, form and appearance, the quality of internal public spaces, and the role of the project in advancing the vision for Discovery Park. The recommended sequence of the design review process should include, but not be limited to:

1. Provide design teams with copies of the master plan and design guidelines
2. Require an initial meeting with design teams to clarify goals for development
3. Require formal intermediate and final reviews of the schematic design phase
4. Require a review just before construction to address any changes in design (not required for changes in construction documents)
5. Conduct a post-construction project assessment including sustainability performance



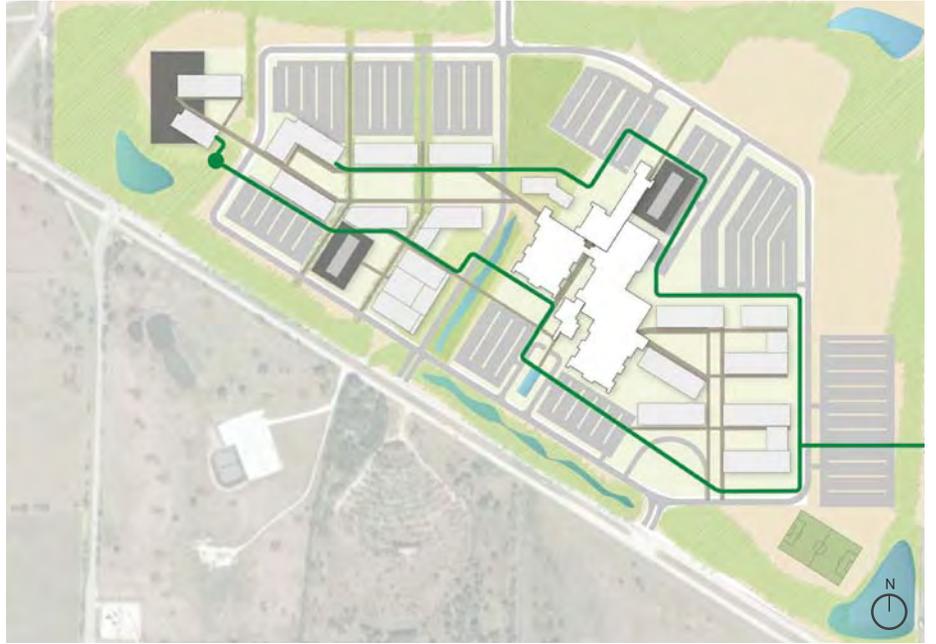


# UTILITIES APPENDIX

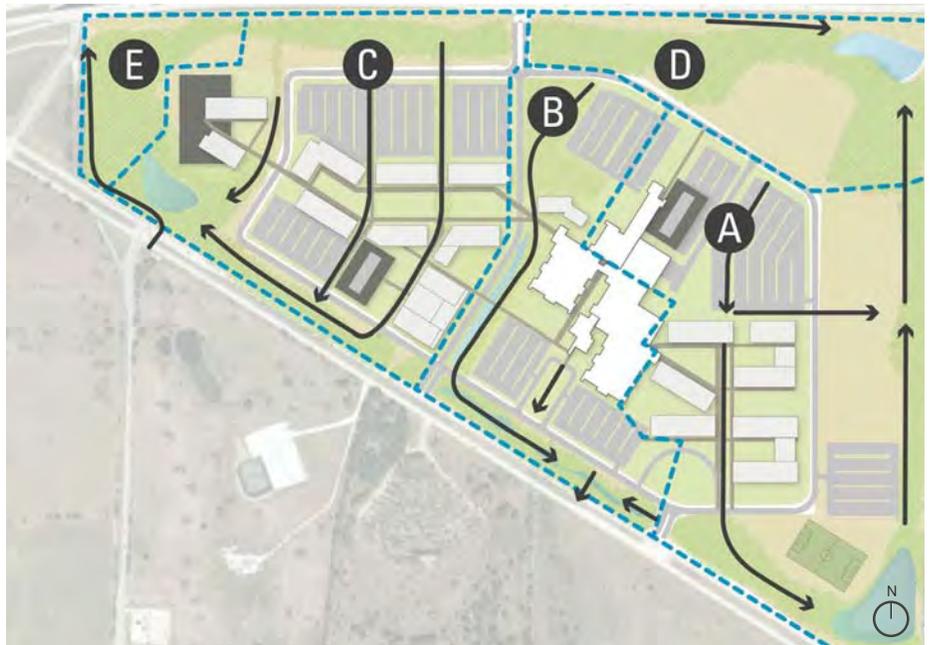
## Stormwater

Effective stormwater management first examines current site performance and then develops the site to mimic that performance, which either maintains or reduces the rate of runoff at prescribed design points. A typical management approach is to collect and convey stormwater via a closed drainage system to retention basins that mitigate flow rates. The system proposed across Discovery Park, however, collects and conveys stormwater through natural open channels that are integrated into the overall landscape design. This more naturalistic approach will begin achieving mitigation goals at the collection and conveyance stages and continue this at the retention basins.

The proposed drainage system will mitigate the increase in stormwater runoff caused by the increase in impervious areas using natural channels, increasing the size of the existing retention basins and the construction of new retention basins.



PROPOSED SANITARY SEWER SYSTEM



PROPOSED WATER SYSTEM

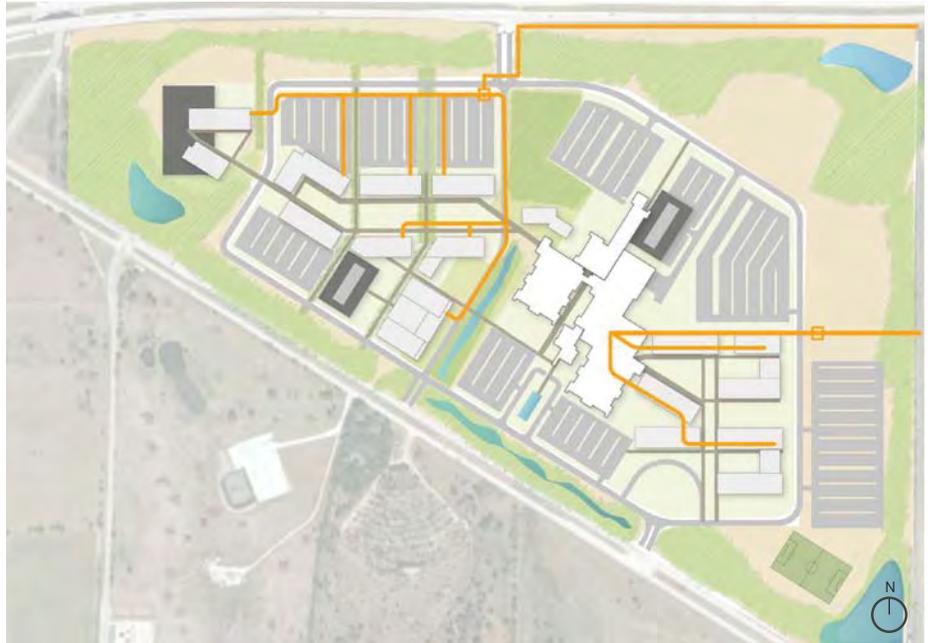
## Sanitary Sewer

The proposed full build out sanitary sewer flow is expected to be approximately 0.1 million gallons per day, (MGD) and will utilize much of the existing sewer system including the existing 12-inch connection to Nicosia Road; (0.05 MGD from UNT and 0.05 MGD from Partners). Currently, the campus sewer infrastructure collects sanitary flows from the north, east and south edges of the Central Building with provisions for expansion to the west. The proposed concept will continue the western expansion to serve the West Science and Technology Precinct. The West Precinct building is expected to be down gradient of the gravity system and will likely require a lift station to collect and discharge to the campus sanitary system. Over the long term, as part of Phase Three, proposed buildings at the east edge of the UNT campus will require a re-routing of the sanitary sewer lines.

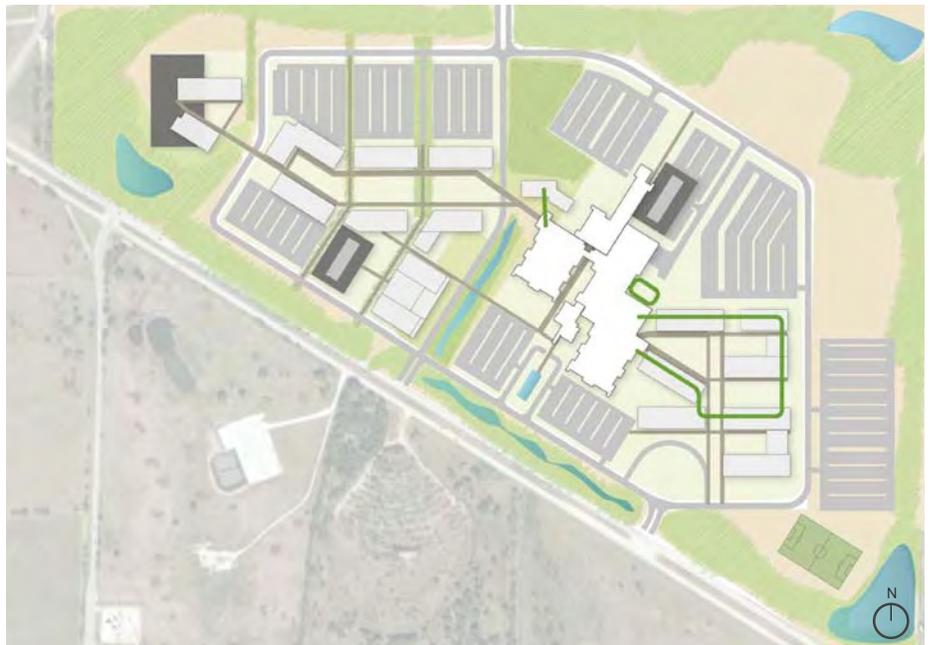
## Domestic Water

The proposed full build-out domestic water demand is expected to be approximately 0.175 million gallons per day, (MGD) and will utilize much of the existing water system, including the existing 12-inch connection to Nicosia Road (0.125 MGD from UNT and 0.50 MGD from Partners). Currently, the campus water infrastructure delivers water through a single meter pit to the fire protection system and the main existing building. Water service to the existing building branches out internally from the point of connection. Within the Central Building, the water service extends east and west to service future build-out identified in the original TI plan. The proposed water service concept is an external loop within the campus loop road that provides the possibility of several future connections to the municipal system in Loop 288 and Highway 77. The loop will serve several functions: it will allow for independent connection of the West Science and Technology Precinct buildings; it will provide more independent metering options; it will provide a level of redundancy that does not currently exist; and it will improve the hydraulic capacity of the campus system and potentially the municipal system. Currently there are no municipal water lines in Loop 288 or Highway 77. Improvements to the municipal system in these areas are important for true redundancy and hydraulic improvements.

The fire protection loop should generally remain as is, with connections to service the proposed build-out of the UNT campus. A sub-out connection currently services the western half of the Park in the direction of the West Partnership Precinct, however it is recommended that these buildings be serviced by stand-alone systems within the precinct as private development occurs. Over the long term, as part of Phase Three, proposed buildings at the east edge of the UNT campus will require a re-routing of the fire protection lines in that area.



PROPOSED ELECTRICAL SYSTEM



PROPOSED THERMAL SYSTEM

## Electric

The proposed full build-out electric system draws on the municipal electric system. It is expected to be approximately 747 amps and will require an additional connection to the regional electrical system. The existing and full build-out of the East Precinct will draw 440 amps through the 13.2kV feeders. The existing municipal connection is adequate to supply this load. The existing switch gear that serves the campus is older technology and should be upgraded. The proposed electric service for the East Precinct will utilize the existing tunnel network, extending it to serve the proposed buildings. The proposed build-out demand of the West Precinct will be 297 amps and will exceed the capacity of the existing connection. A new 13.2kV feeder will be required to serve the West Precinct. This new connection will likely extend from the lines within Nicosia Road. UNT will need to engage with the electric municipality to determine connection locations and future municipal improvements.

For all existing and proposed buildings, individual sub-meters will be installed to monitor performance of individual building on the UNT campus and to determine billing and performance in the West Partnership Precinct.

## Thermal

The existing chiller plant that serves the UNT building has adequate space to be expanded to serve all of the proposed UNT buildings. The projected load for the UNT build-out is 2,300 tons. The proposed chiller plant will be configured with four 1,600 ton chillers for a total capacity of 6,400 tons. This configuration will provide a high level of redundancy. The Partners Precinct will achieve its cooling needs through individual units associated with individual buildings.

The existing hot water boilers that serve the UNT buildings will be replaced with high efficiency modular boilers that will serve the existing and future needs of the UNT campus. The West Science and Technology Precinct will achieve its hot water needs through individual units associated with individual buildings.

In both cases, the proposed chiller plant and hot water boilers should be re-considered against the most up-to-date technology before they are installed.



PROPOSED NATURAL GAS SYSTEM

## Natural Gas

The proposed full build-out natural gas demand is expected to be approximately 92,000 CFH and will utilize the existing gas service to the UNT building, and require an additional connection to serve the Partners Precinct. The UNT East Precinct will demand 50,000 CFH and will require that a new 8" line be extended from Highway 77 to the UNT central plant. The West Science and Technology Precinct will demand 42,000 CFH and will require a new 6" line be extended from Highway 77 to a service main that will distribute to the individual buildings.

For the proposed West Precinct buildings, individual sub-meters will be installed for billing purposes and to monitor performance of individual buildings.







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