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UNIVERSITY OF SOUTH DAKOTA

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

DISTRICT MASTER PLAN / 01 . 30 . 2015

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

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MASTER PLAN CONTENTS

UNIVERSITY OF SOUTH DAKOTA

Adopting the University of South Dakota's signature red is a nod to the state's flagship institution. But beyond the vast resources of the university system, it means the District is rooted in a culture of learning and research.

DISCOVERY

An investment in the innovation infrastructure of the nation, Discovery District supports research, collaboration and talent far beyond its boundary. The discoveries that will be made here will foster innovation, entrepreneurship and economic impact.

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

DISTRICT

The District is a high-performing community with an energy all its own. Neither a closed-off campus or gated office park, it is a vital extension of the city itself.

INTRODUCTION

The University of South Dakota Discovery District will be a resource for generating economic development. Located on 80 acres in the northwest corner of Sioux Falls, the land for the USD Discovery District was made available by an act of the state legislature in 2009. In 2012, South Dakota passed legislation authorizing the establishment and operation of research parks on land controlled by the Board of Regents. That same year, the University of South Dakota Research Park, Inc. corporation was formed and, in July 2013, leased the 80-acre site from the Board of Regents for 99 years. The corporation remains the driving force behind the District's development on the site.

The vision for the Discovery District includes capitalizing on the economic growth potential of university research, faculty, students and expertise and supporting growth of private sector research and companies in the Sioux Falls area.

DISCOVERY DISTRICT GOALS

1. Grow Unversity of South Dakota research capacity, resources and talent.
2. Connect core University activities with private sector resources and companies.
3. Foster entrepreneurship and commercialization through a robust incubation program.
4. Facilitate the creation of the physical infrastructure necessary to support creation and attraction of research and innovation-based businesses.

Our vision for the University of South Dakota Discovery District is to create a dynamic and collaborative environment where talent, research, and innovative businesses interact to create new ideas, new technologies and new opportunities impacting not only our region, but our world.

A broad group of stakeholders representing education, business and government have partnered to ensure this vision becomes reality. Dedicated to achieving our mutual objectives are: the University of South Dakota, the South Dakota Board of Regents, the City of Sioux Falls, Forward Sioux Falls, the Sioux Falls Area Chamber of Commerce, and the Sioux Falls Development Foundation.

Together we will connect students, faculty, entrepreneurs, artists and thought leaders. By creating partnerships with industry, investors and government we will create the physical community and infrastructure vital to taking ideas and making them reality.

We are passionate about our vision, steadfast in our commitment, and resourceful in the execution of our plan. We invite you to join us on this journey and, together, we will create a new destination.

Richard Naser, Jr.
President
USD Research Park, Inc.

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

01

RESEARCH PARKS TODAY

THE HISTORY OF RESEARCH PARKS REFLECTS TRENDS IN CITY BUILDING

CORPORATE RESEARCH EMERGENCE

The suburban park is the typical structure of most R&D parks in the US. The "office park" formula provides for maximum development flexibility, with each parcel acting as a separate entity operating under a common management structure. Internally-focused and separated by woods and surface parking, isolated buildings value privacy over activity in the public realm.

CORPORATE RESEARCH CAMPUS

Based on a traditional academic campus, the structure fosters research within a natural setting where common open space and landscape are the binding elements between separated users.

CORPORATE + ACADEMIC RESEARCH PARK

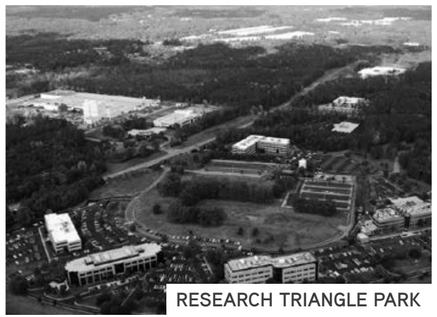
Based on typical urban environments, the design of today's integrated corporate and academic research parks is informed by the surrounding context, providing a programmatically diverse environment in an urban village atmosphere. These mixed use environments prioritize walkability and liveability to attract the next generation of scientists and researchers.

> "If you take the major research institutions and tech clusters that are being created, how do you take them and arrange them in a purposeful way with mixed use housing and amenities that attract talent but work for industry?"

Bruce Katz, Brookings Metropolitan Policy Program
Wired Magazine, February 29, 2012

WITHIN THE VAST RANGE OF PARKS THAT EXIST TODAY, THREE TYPES ARE MOST COMMON

STANFORD RESEARCH PARK



RESEARCH TRIANGLE PARK

WV REGIONAL TECHNOLOGY PARK

GM TECHNICAL CENTER

UCSF MISSION BAY

UNIVERSITY OF MARYLAND BIOPARK

SUBURBAN PARK

The suburban park is the typical structure of most R&D parks in the US. The "office park" provides for maximum development flexibility with each parcel acting as a separate entity operating under a common management structure.

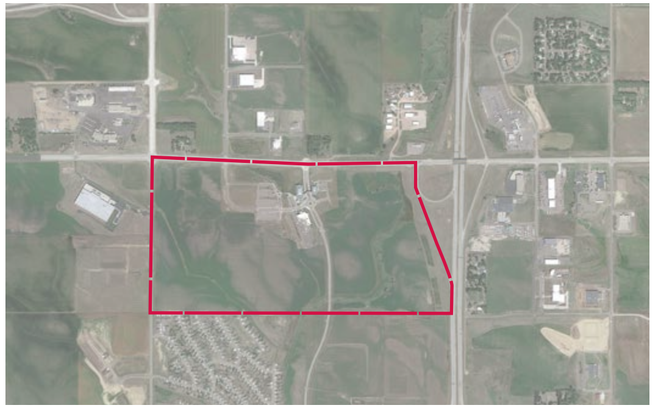
TRADITIONAL PARK

Based on a traditional academic campus, the structure provides for research to be fostered within a natural setting where common open space and landscape are the binding elements between separated users.

URBAN VILLAGE

Based on typical urban environments, the structure of the urban village is informed by and integrated into the surrounding context providing a programmatically diverse environment.

AT 252 ACRES, THE COMBINED DISCOVERY DISTRICT AND SURROUNDING BOARD OF REGENTS PROPERTY IS LARGER THAN MANY DENSE URBAN PARKS.



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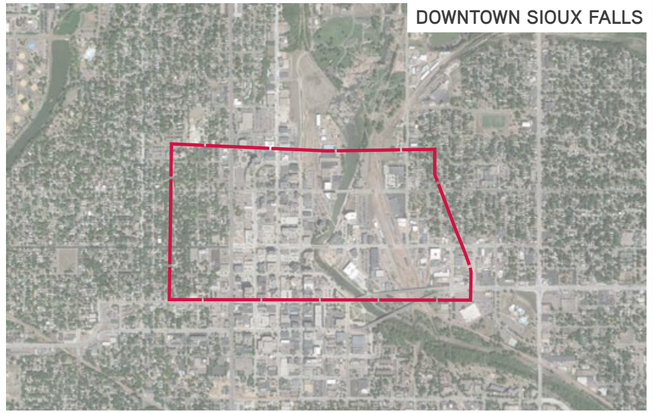
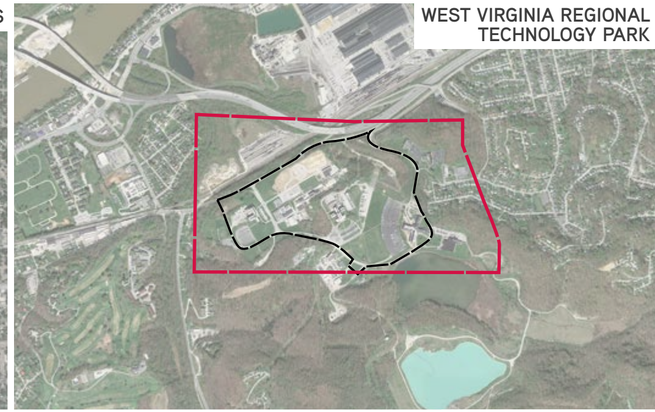
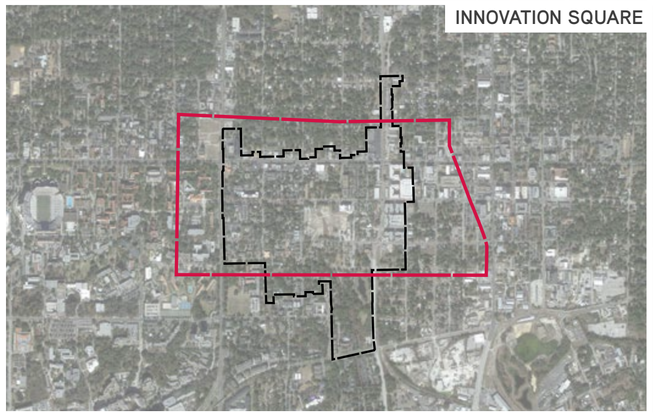
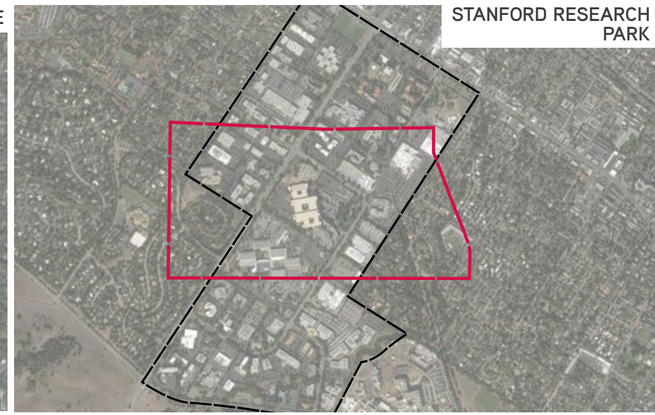








UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

02

CONTEXT

WORLD CLASS PARTNERS ARE LAYING THE GROUNDWORK FOR SUCCESS IN THE DISTRICT




BOARD OF REGENTS

The Board of Regents oversees the six higher education institutions within the state: The University of South Dakota, South Dakota State University, Dakota State University, South Dakota School of Mines and Technology, Northern State University and Black Hills University. In addition, the Board oversees the state's three University Centers as well as the South Dakota School for the Blind and Visually Impaired and the South Dakota School for the Deaf. In 2009, the South Dakota legislature authorized the establishment of an 80-acre research park at University Center in Sioux Falls on the 252-acre site in northwest Sioux Falls. In July 2013, the USDRP Corporation entered into a 99-year lease with the Board of Regents for the research park site.

UNIVERSITY OF SOUTH DAKOTA

Founded in 1862, the University of South Dakota is the oldest university in the state and the state's flagship institution. The main campus is located 50 miles south of Sioux Falls in Vermillion. With over 10,000 students, it is the second largest university in the state. USD offers 205 undergraduate and 65 graduate programs. 70 percent of the attorneys, 48 percent of physicians and half of the teachers within the state of South Dakota are USD graduates. USD's Biomedical Engineering program is headquartered at the GEAR Center that is adjacent to the Discovery District in Sioux Falls. Current focus areas of faculty activity for the Biomedical Engineering program include, Biomaterials for Drug Delivery, Tissue Engineering and Regenerative Medicine and Nanomaterials for Biological Sensing. Forbes ranked USD as a Best Value College for 2013.

UNIVERSITY CENTER

The South Dakota Public Universities and Research Center, or University Center, is adjacent to the research park and represents the six higher education institutions of South Dakota. Consisting of two new high performance buildings totalling 110,000 SF, University Center serves nearly 3,000 students from the greater Sioux Falls community. University Center was created to provide access to a quality public education, with a special focus on providing opportunities for non-traditional and adult learners.

USD SANFORD SCHOOL OF MEDICINE + RESEARCH

Also located in Sioux Falls is USD's Sanford School of Medicine. The school is a community-based medical school with more than 300 academic faculty and more than 700 clinical faculty across South Dakota. Founded in 1907, the school started with a two year pre-medical work program and two years of medicine. In 2005, the school was officially renamed Sanford School of Medicine in honor of philanthropist Denny Sanford. The Sanford School of Medicine is consistently ranked by U.S. News & World Report as is one of the nation's top 5 leaders when it comes to rural medicine.

SANFORD RESEARCH

Sanford Research, a non-profit research organization, is a component of Sanford Health. Its state-of-the-art facilities include a vivarium and are located on East 60th Street at the Sanford Center in Sioux Falls. With a team of more than 200 researchers, Sanford Research is comprised of several research centers, including Children's Health Research, Edith Sanford Breast Cancer, Cancer Biology, the Center for Health Outcomes and Prevention and the Sanford Sports Science Institute. Sanford Research is dedicated to finding cures, eradicating disease and improving the lives of people around the world through scientific breakthroughs.

AVERA RESEARCH INSTITUTE

The Avera Research Institute's mission is to be a leader in applied, basic and clinical research by partnering with others who are committed to excellence. The Institute's basic research activities include both Kidney and Neuroscience Research Centers and are focused on fundamental mechanisms of physiological

and pathophysiological functions of cells and organs. The applied research division is working to solve practical problems of the modern world and is focused on tissue healing and repair. The Institute's clinical division partners with physicians serving as principal investigators and subinvestigators to conduct both inpatient and outpatient clinical research.

AUGUSTANA COLLEGE

Augustana College - commonly refered to as "Augie" - is a private, liberal arts college located in Sioux Falls and affiliated with the Evangelical Lutheran Church in America. Originally opened as The Lutheran Norman School in 1889 and later mergered with Augustana College in Canton in 1926, today Augustana College offers degrees in over 50 different fields of study with highly regarded pre-professional program in nursing. The college has an enrollment of 1,850 students an academic staff of 134.

UNIVERSITY OF SIOUX FALLS

Founded in 1883, the University of Sioux Falls (USF) is a Christian, Liberal Arts University affiliated with the American Baptist Churches, USA. With an enrollment of 1,419 total students from 34 states and 11 countries, USF offers more than 80 undergraduate academic programs, including majors, pre-professional programs, minors and specializations and adult and graduate offerings in business, degree completion, education and nursing, as well as the Center for Professional Development.

SOUTHEAST TECHNICAL INSTITUTE

The mission of Southeast Technical Institute - or Southeast Tech - is to educate individuals for employment opportunities, professional growth and lifelong learning. Southeast Tech's vision is focused on workforce development. It serves more than 2,000 students and offers diplomas, certificates and Associates of Applied Science degrees in fields such as business, computer information systems, computer science, engineering and engineering technology, medical technology and nursing. The institution produces the third largest higher education graduating class in the state.

SOUTH DAKOTA TECHNOLOGY BUSINESS CENTER

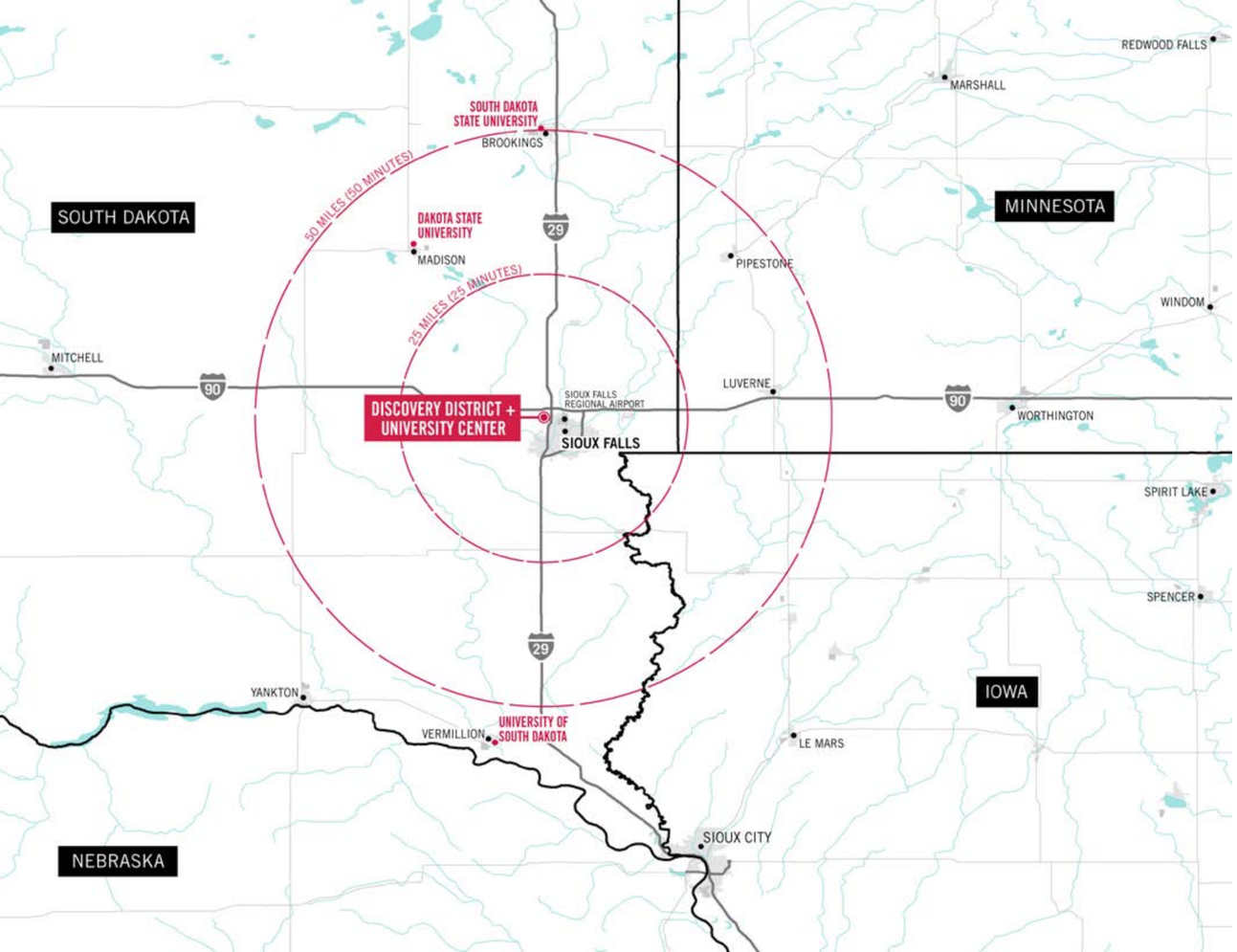
The 45,000 squarefoot South Dakota Technology Business Center (SDTBC) is located adjacent to the south campus of the University Center and to the Southeast Technical Institute. The campus is physically connected to the Sioux River Greenway Bicycle Trails system. The SDTBC is an incubator that provides business development assistance, flexible lease terms and a turnkey technology infrastructure to its clients.

CITY OF SIOUX FALLS, CITY PLANNING DEPARTMENT

The City Planning Department of Sioux Falls provides direction for the physical development and quality of life within the city. The Department implements its mission through the development of transit, transportation, long-range plans, downtown development, historic preservation, neighborhood conservation activities, and the coordination of public improvements and private development with the comprehensive plan, zoning, and subdivision ordinances.

"The USD Discovery District will attract and retain talent, expand our state's research capacity and foster commercialization of research. By accelerating the launch and growth of innovative companies, we will expand opportunities for future generations of South Dakotans."

James W. Abbott, President
University of South Dakota



AT THE HEART OF THE REGION'S ACADEMIC, CULTURAL, AND BUSINESS LANDSCAPE...

CONNECTING INSTITUTIONS

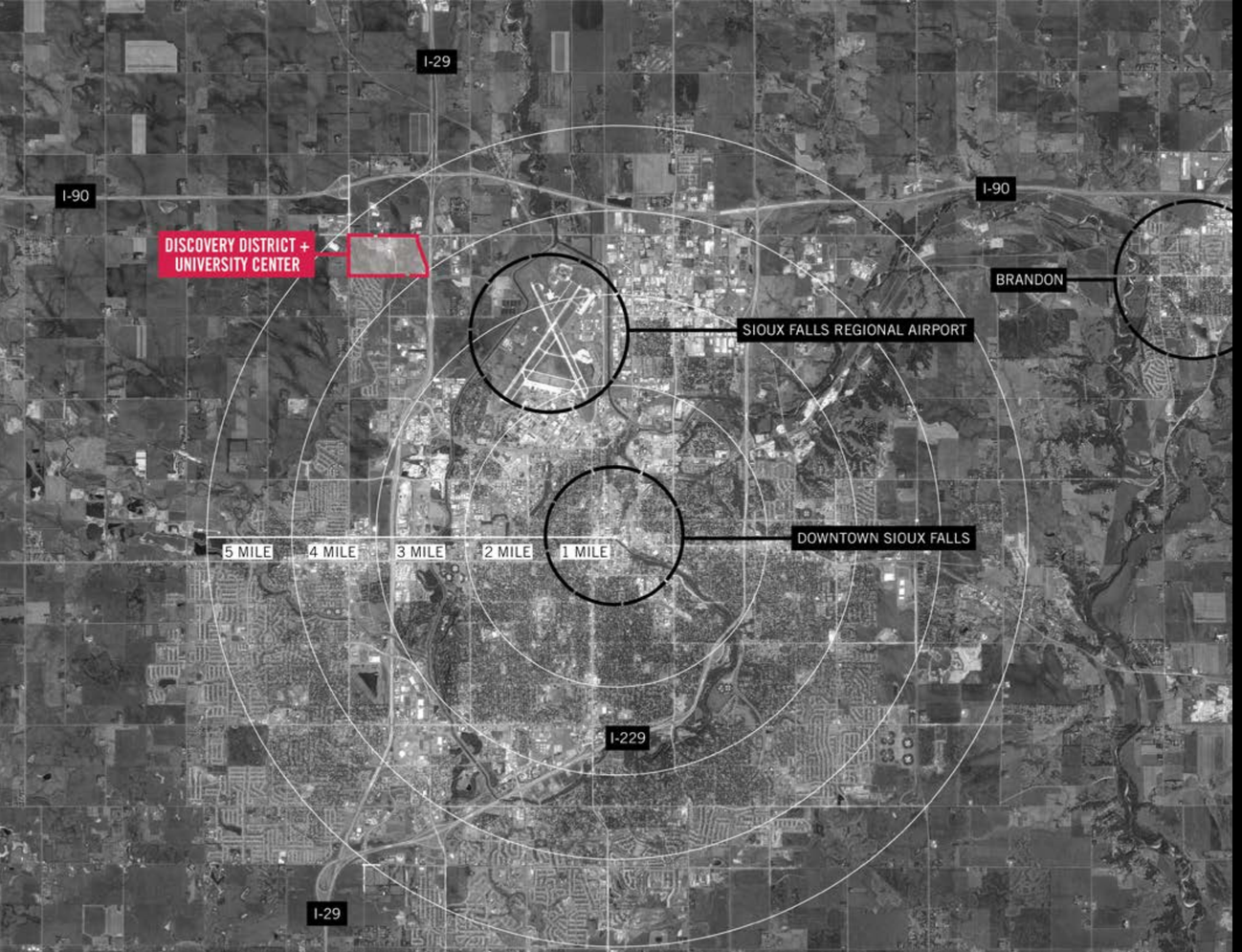
The Discovery District is situated in the growing northwest corner of greater Sioux Falls and easily connected to South Dakota's academic institutions. Conveniently located along I-29 and one mile from I-90, the District is an hour drive from the University of South Dakota, 50 miles to the south in Vermillion. South Dakota State and Dakota State University are both located approximately 50 miles north of the District. In a community that is accustomed to commuting on a daily basis, the distance between these institutions and the District is not significant. Additionally, Augustana College and the University of Sioux Falls are both located near downtown Sioux Falls within a 15-minute drive of the District.

DESTINATION: SIOUX FALLS

Sioux Falls is the largest city in South Dakota. Like many cities across the nation, its downtown is seeing a resurgence of new interest and development. Phillips Avenue is an active, pedestrian-friendly corridor of retail, restaurants and offices. Several new developments have occurred within the past five years adjacent to the Big Sioux River, one block from Phillips Avenue, including a new hotel, Raven Industries' corporate office, and the revitalization of many of the city's older structures. The city has an open space network of over 70 parks and greenways including Falls Park in downtown.

South Dakota has no state corporate income tax, state personal income tax, personal property tax or inventory tax, and as a result, several financial companies including Wells Fargo and Citigroup call Sioux Falls home. Other important financial service companies located in Sioux Falls include MetaBank, Target Card Services, TCF Bank, NCB Management, Great Western Bank, CNA Surety, Total Card Inc., CAPITAL Services, Sammons Financial Group/Midland National Life Insurance Company, Capital One, and Premier Bankcard/First Premier Bank.

Sioux Falls is also a significant regional health center with the health sector employing more than 22,000 people. Sanford Health and Avera Health are the community's largest and second largest employers respectively. The Sioux Falls medical community also includes the Sioux Falls VA Health Care System, LifeScape and the Evangelical Lutheran Good Samaritan Society, the largest not-for-profit senior care provider in the US.



SIOUX FALLS: AT THE INTERSECTION OF BUSINESS GROWTH AND QUALITY OF LIFE

- Sioux Falls ranked #9 in POLICOM's 2013 Economic Strength Ranking. (March 2013)
- Sioux Falls ranks 3rd regionally, 18th within its population category, and 46th overall in Area Development's Leading Locations for 2013 report for economic and job growth. (May 2013)
- Becker's Hospital Review named Avera Health and Sanford Health to its list of 100 Integrated Health Systems to Know based on health systems' range and coordination health care services. (June 2013)
- CNBC named South Dakota the number one state for business in America's Top States for Business 2013.
- South Dakota has the lowest cost of living in the nation according to the U.S. Department of Commerce. South Dakota also reported the nation's largest growth in personal income adjusted for inflation at 10.4% from 2010 to 2011. (Summer 2013)
- According to the "Business Tax Index 2013" ranking of state tax systems for small business and entrepreneurship, South Dakota ranks 2nd best in the nation. (April 2013)
- Sioux Falls is named the "Best Small City for Business and Careers" by Forbes. (August 2013)
- Prevention magazine ranked Sioux Falls No. 9 on their list of the 25 healthiest, happiest cities in America. (August 2013)
- According to RealtyTrac's 2013 Health & Wealth Special Report, Sioux Falls ranks as the 12th best place to invest in real estate and your health. (August 2013)
- Sioux Falls is one of the 25 Best U.S. Cities for Tech Startups per a report released by the Ewing Marion Kauffman Foundation. (August 2013)
- CNN ranked Sioux Falls the 45th best place to live and launch a business out of a list of 100. (2009)
- Avera McKennan Hospital was named to the "100 Hospitals with Great Neurosurgery and Spine Programs" by Becker's Hospital Review. (2013)

ON THE LEADING EDGE OF A GROWING COMMUNITY

SURROUNDING DEVELOPMENT

Immediately adjacent to the District, several new commercial developments are under construction.

To the west of the District is University Hills: an 80-acre mixed-use community currently under development. When complete, the project will include single-family and multi-family residential, office and retail space including a child care, restaurants and a fitness center.

To the north of the District, Campus Crossing is under development. The anchor for this 50-acre commercial project is a Walmart Supercenter.

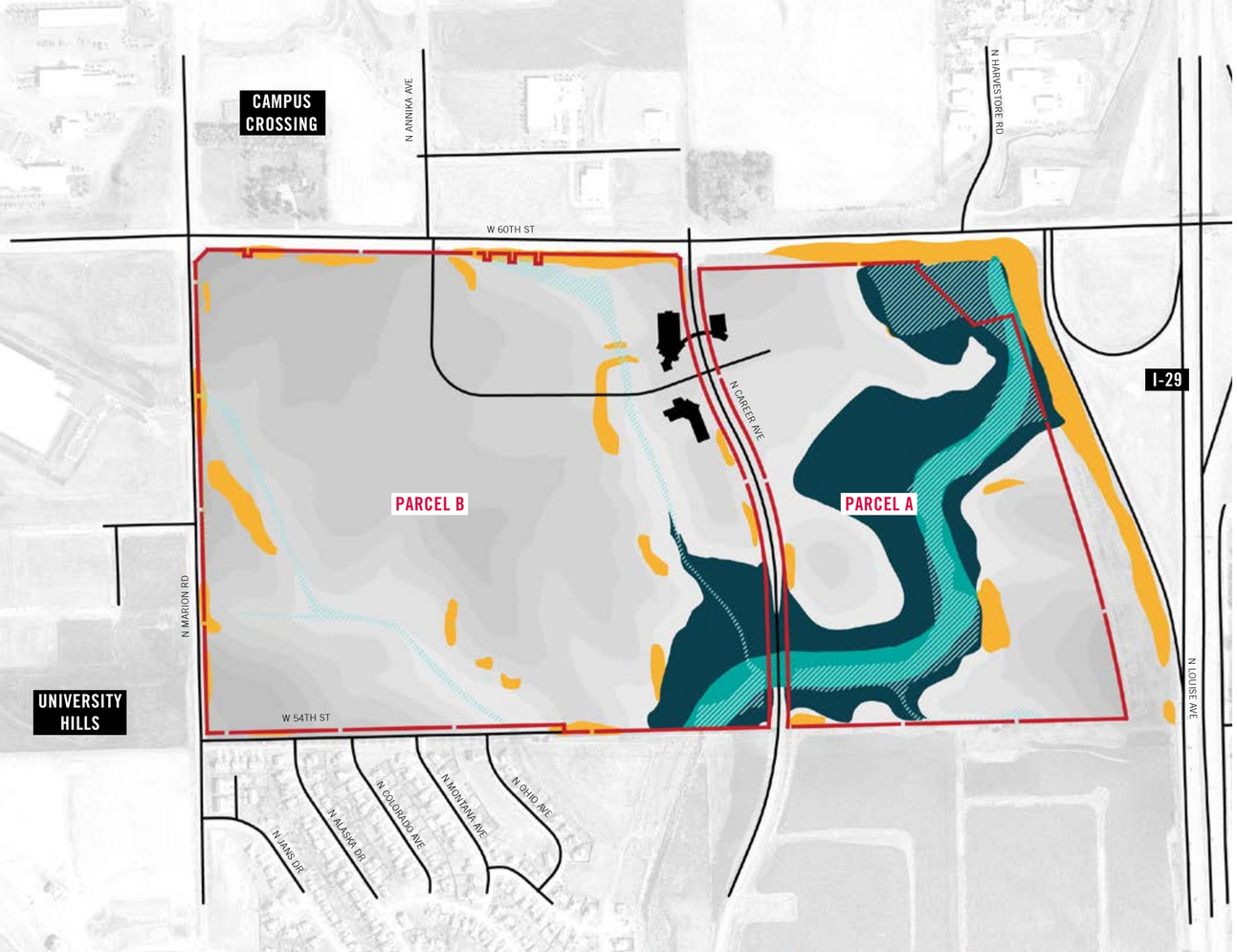
To the south of the District is the proposed extension of the City's greenway system. Lien Park and Green Hills Greenway provide active and passive recreation activities for the surrounding community. This new public greenspace will eventually connect the District to the South Dakota Tech Business Center and the Southeast Technical Institute.

The District is located within a few miles of the Sioux Falls Regional Airport, which is celebrating its 75th anniversary. The 105,000 SF facility is served by six national carriers along with seven cargo carriers. The airport is currently developing a hotel immediately adjacent to the terminal.

To the west of the airport, the Sanford Sports Complex is an athletics-focused development. In addition to outdoor fields, hotel, and retail, the complex includes the 160,000 SF Sanford Pentagon, a predominantly indoor basketball court facility, and the Sanford Fieldhouse, an 85,000 SF facility that includes a 62,000 SF athletic turf field, Scheels IcePlex 3-sheet ice facility and the new Huether Family Match Pointe community indoor tennis center.

"University Center and the (future) USD Discovery District are really finding ourselves in the center of it all. There's a lot going on that makes this a rich and vibrant addition to the city."

Craig Johnson
Executive Director
University Center



BOUNDARY

Established by a legislative act in 2009, the District is identified as an 80-acre parcel running parallel to 60th Street North within the larger Board of Regents property. These boundaries were changed as a result of a planning process that began with a comprehensive analysis and conceptual design approach to the entire 252-acre parcel. As development occurs and opportunities are presented or needs are identified, the boundary of the District is likely to shift again.

EXISTING BUILDINGS

GEAR CENTER

Opened in 2009, the Graduate Education & Applied Research (GEAR) Center is home to USD's Biomedical Engineering (BME) program. The 22,000 SF two-story facility provides resources for both private and public development. The facility includes specialized research suites, equipment and technical staff. The center includes an 835 SF Aseptic GMP Production and Training center. Designed to be expandable, the facility will ultimately grow to 67,000 SF.

The BME program focuses on the application of engineering and science methodologies for the analysis of biological and physiological problems and development and delivery of health-care technologies. The current focus areas of the program are: Biomaterials for Drug Delivery; Tissue Engineering and Regenerative Medicine; and Nanomaterials for Biological Sensing. USD Biomedical Engineering also plays a major role in the new Biochemical Spatia-temporal NeTwork Resource (BioSNTR) research center that will integrate state-of-the-art fluorescence imaging, computational sciences and bioengineering research and development.

CLASSROOM BUILDING — UC MAIN, UNIVERSITY CENTER

As one of three models across the state, the University Center was created to provide access to a quality public education with a special focus on providing opportunities for non-traditional and adult learners. The building includes classrooms and an open computer lab as well as offices for Administration, Advising, Business Office/Cashier, Technology Services, Financial Aid and Center Shop. The facility also includes Avera Hall, a 131-seat auditorium.

THE SCIENCE AND TECHNOLOGY BUILDING

This 50,000 SF space at University Center was built in 2011. Classrooms provide a range of seating capacity options allowing for program flexibility. Physics, chemistry, biology and microbiology labs are designed for 100-200 level courses. A future addition is planned to the south to support increasing enrollment numbers of non-traditional students. A future pedestrian bridge has been planned for student and faculty circulation in inclement weather.

PHYSICAL FEATURES

SLOPES

The site is characterized by its rolling hills and existing agricultural uses. Areas of the site closest to 60th Street are relatively flat. Areas with the steeper slopes are generally located adjacent to the floodplain and floodway areas.

ROAD NETWORK

The District is located on a greenfield site bounded by I-29 to the west, W. 60th Street to the north and N. Marion Road to the west. N. Marion Road and 60th Street are classified as arterial streets. The southern boundary is partially defined by W. 54th Street, a residential street serving the adjacent single-family residential to the south. N. Career Avenue bisects the site connecting at 60th Street to the north and W. Benson Road to the south. Career Avenue is classified as a collector street.

UTILITIES

City utilities, including water and sanitary sewer, are located in close proximity to the proposed District development. There is an 8-inch water main on the east end of "Main Street" and a 16-inch water main on the south side of 60th Street that will be extended down Annika Avenue to complete the looped system. Sanitary sewer will serve the District by extending an 8-inch pipe on Main Street from the existing sanitary sewer trunk system located west of the campus.

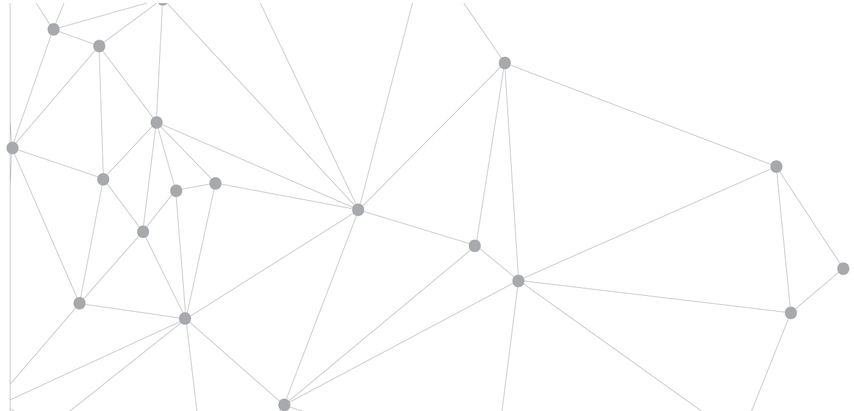
Other private utilities including communication lines, gas and electric are located in the public right-of-ways near the proposed site.

Drainage piping, inlets, storage and treatment facilities will be designed with the other infrastructure improvements. Runoff water will flow toward the south and southeast to the major drainage channel located approximately 2,000 feet from the site.

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

03

MASTER PLAN VISION



A BEACON FOR INNOVATIVE RESEARCH AND ENTREPRENEURSHIP IN OUR REGION

The vision for the Discovery District combines a deep understanding of this particular site and its place in a constellation of leading academic institutions across the region. This unique place is then viewed through the lens of best practices in research districts worldwide. The resulting plan responds to the guiding vision of a highly-attractive environment for fostering science and innovation by achieving the following goals: (1) Leverage Existing Assets, (2) Establish an Integrated Place, (3) Connect People and Spaces, (4) Mix Uses and Users and (5) Embed Development Flexibility.

LEVERAGE THE EXISTING ASSETS

Although the District is not located within the downtown area or any established business or academic districts, the site provides several key advantages. The close proximity to the airport and the two interstates allow for easy accessibility. The existing facilities, University Center and the GEAR Center provide outstanding facilities, academic programs and several new companies.

ESTABLISH AN INTEGRATED PLACE

The District has to be a place that draws not only the best researchers, students, faculty and staff, but also the surrounding community. The District has to have its own sense of place that is recognizable within Sioux Falls and the surrounding region as an integrated community with a research foundation.

CONNECT PEOPLE AND SPACES

Many of today's knowledge workers are looking for an environment that creates opportunities for collaboration beyond the lab: where the opportunity to share a coffee with a fellow researcher or student or go for a walk is part of the everyday environment. From parks and trails to inviting streetscapes, a connected public realm brings people together and supports a community of collaboration.

MIX USES AND USERS

Yesterday's traditional research parks divided users and companies. Today's innovation districts mix uses and users to create an environment that is rich with collaboration. Flexible, mixed-use spaces are attractive to tenants and developers as they are more adaptable to changing market conditions.

EMBED DEVELOPMENT FLEXIBILITY

The development of the District is not set in a prescribed amount of square footage on a certain date. There are too many examples of research parks or developments in general that identified a vision, developed a plan and built the project only to see the market shift. A key component of the District strategy is a flexible framework that has the capacity to adapt to changing market conditions or opportunities. In today's economy, research companies are more interested in renting than owning facilities. Renting allows organizations to adapt to an ever-changing market.

LARGE SCALE PLANNING FOR HUMAN SCALE MOMENTS

While the District is only 80 acres, the Master Plan includes the conceptual infrastructure strategy for the entire 252-acre site controlled by the Board of Regents. It is important that the Discovery District and the site are seen as one place.

The plan focuses on three binding elements: the Framework, the Activity Corridor and the Open Space Network while providing further guidelines for parking strategies, zoning, and design.

DISCOVERY DISTRICT BOUNDARY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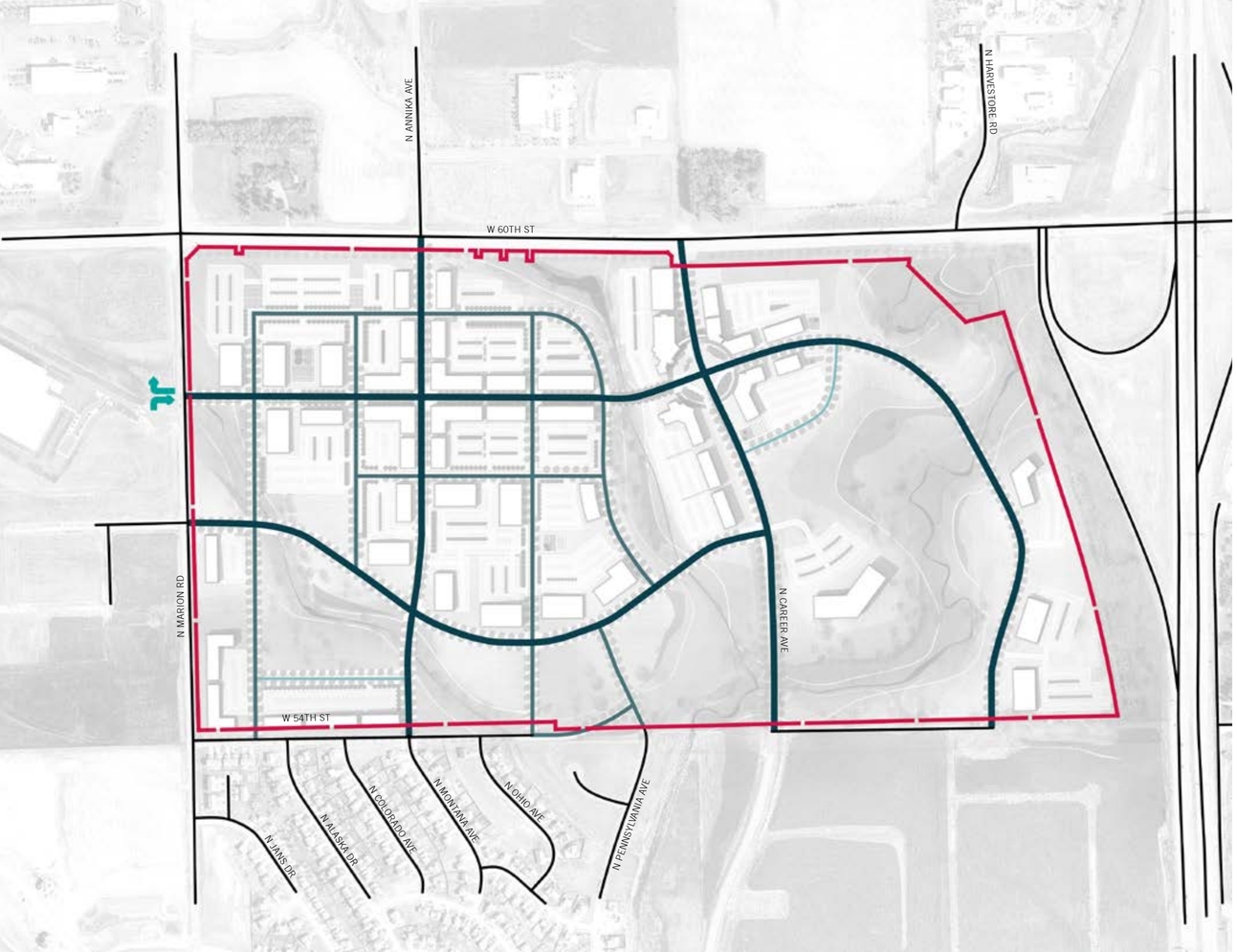
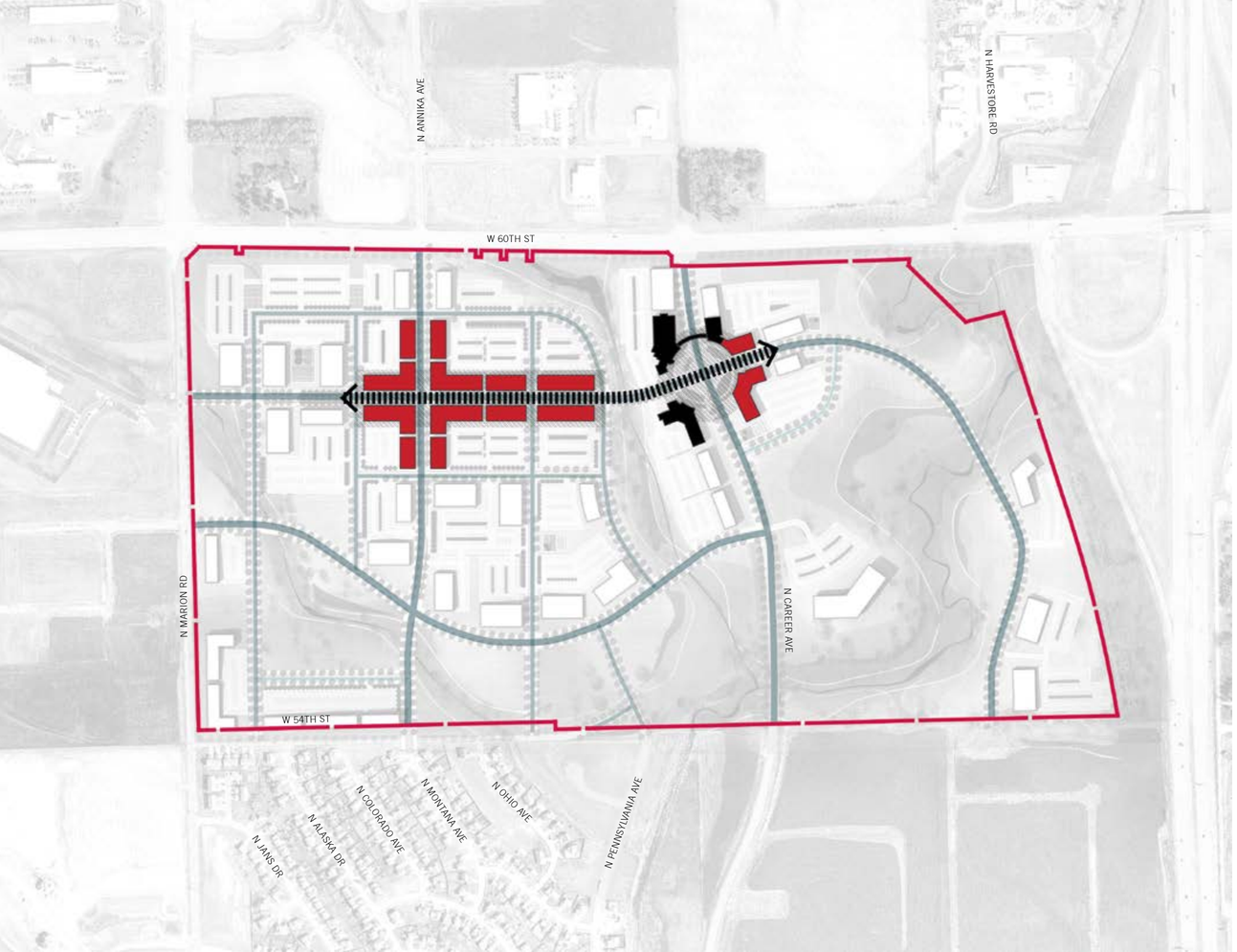


THE MASTER PLAN LAYER 1
THE FRAMEWORK

The Framework provides guidance for the future development of the District locating development and non-development areas. This framework further influences building orientation, parking locations and open space. The street network identifies three types of streets: primary, secondary, and tertiary streets. Primary streets are the most significant within the District. These streets are the gateways to the District and provide connectivity to the surrounding community. Regardless of their location within the District, buildings are oriented towards primary streets. Seconday streets are generally connector streets linking primary streets to one another within the District. In profile they are generally smaller. While pedestrian friendly, they are not pedestrian-intensive streets. Tertiary streets are flexible. They are smaller in scale and act as service streets



THE MASTER PLAN LAYER 2
THE ACTIVITY CORRIDOR

To be competitive with other research parks throughout the country, the Discovery District must establish a sense of place that appeals to researchers, students, faculty and staff as well as the surrounding community. The environment must be collaborative within the labs and classrooms as well as outside of these facilities. Many of the traditional "suburban office parks" of the past are losing tenants and not capitalizing on opportunities as users are seeking more of an urban environment to work within. In fact, several successful traditional research parks are developing strategies to adapt their parks to address the needs of current and future users.

The activity at the District would parallel 60th Street taking advantage of the proximity to University Center, visibility from the local community's primary east-west street, the minimal slope of the land and the existing infrastructure already in place. University Center and the GEAR building would be the eastern anchor for the street. This street will be the defining physical element of the District. Typical of a good pedestrian friendly urban environment, the buildings would be placed facing towards the street. Parking would be located to the rear of the buildings. A wide generous sidewalk with shade trees and areas for outdoor engagement is a critical design feature. Buildings along the street will include retail, restaurant, hospitality and some residential as well as research and classroom. The ground floor of these buildings is critical: the building spaces must be active with storefronts that can be adapted to retail or other commercial users.

THE MASTER PLAN LAYER 3
PUBLIC SPACES

Not all spaces are located within the public realm but each contributes to the unique character of the District while enhancing the quality of life of researchers, students and visitors. These spaces can provide opportunities for gathering, collaboration and reflection. The goal is to provide a spatial strategy to define areas of development within the District. For the Discovery District, the focus is on leveraging and designing its open space as a means to organize the 80 acres of the District within the 252-acre larger site. This open space also serves several critical functions. First it provides opportunities for recreation for the users within the District and the surrounding community. It also provides an opportunity to extend the City's park and greenway initiative to the south, connecting the District to the larger community. These open spaces also serve as an opportunity for preservation of open space as well as locations for stormwater infrastructure.







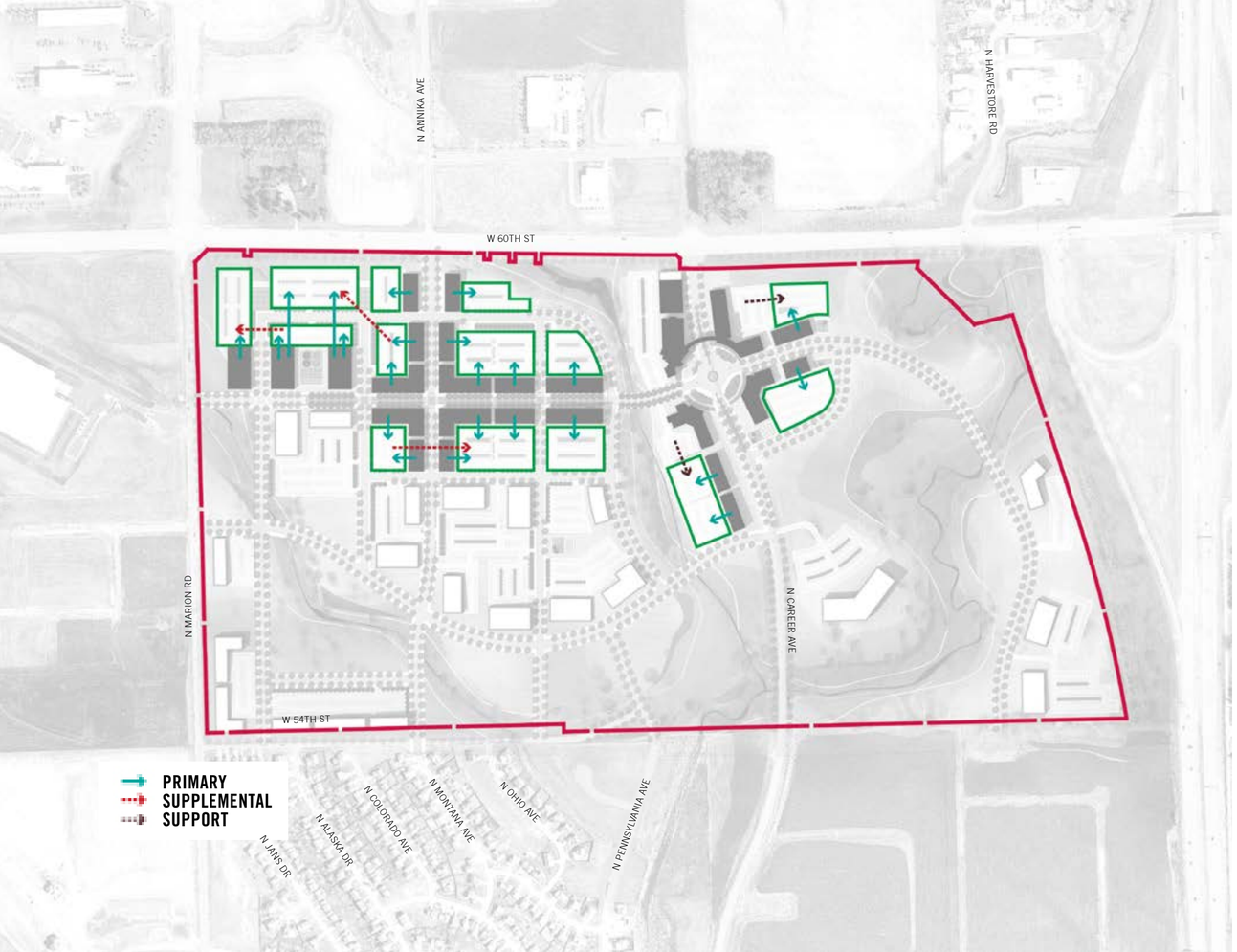





DISCOVERY DISTRICT

THE MASTER PLAN LAYER 4
MIXED USES

Traditional suburban research parks are based on a separation of land uses with one specific user. The District shall encourage a mix of uses including retail, restaurant, hospitality and limited residential within the Activity Corridor. While the primary uses within the District shall be research and academic, the mixing of additional uses will create an environment where support services for researchers, students, faculty and staff are within walking distance creating an environment for collaboration. Retail and residential are strongly encouraged at the southwestern corner of the site. With the adjacent commercial and residential uses at University Hills, retail and residential would strengthen these intersections as a community mixed-use node.



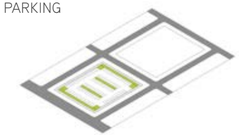
THE MASTER PLAN LAYER 5

PARKING STRATEGIES

With its location at the edge of the city, the users of the District will be car-dependent for the foreseeable future; providing sufficient and convenient parking is a pre-requisite. However, providing excess parking will negatively impact the District's physical environment. The District shall seek a reduction in the parking required by the City as a part of the existing zoning category. Additionally, the District shall establish a mechanism for shared parking so that as a whole the District is parking to the minimum requirements by zoning. This approach will encourage users to seek shared parking opportunities and reduce the amount of surface parking required for the District while still addressing the needs of the individual users. While some users require higher parking ratios, other users such as research and light manufacturing that have large building area requirements but with minimal staff needs must have a mechanism to reduce the parking requirements.

THE EVOLUTION OF PARKING

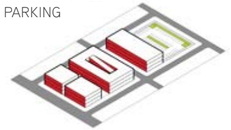
1. SURFACE PARKING



2. NEW DEVELOPMENT

3. NEW DEVELOPMENT + NEW SURFACE PARKING

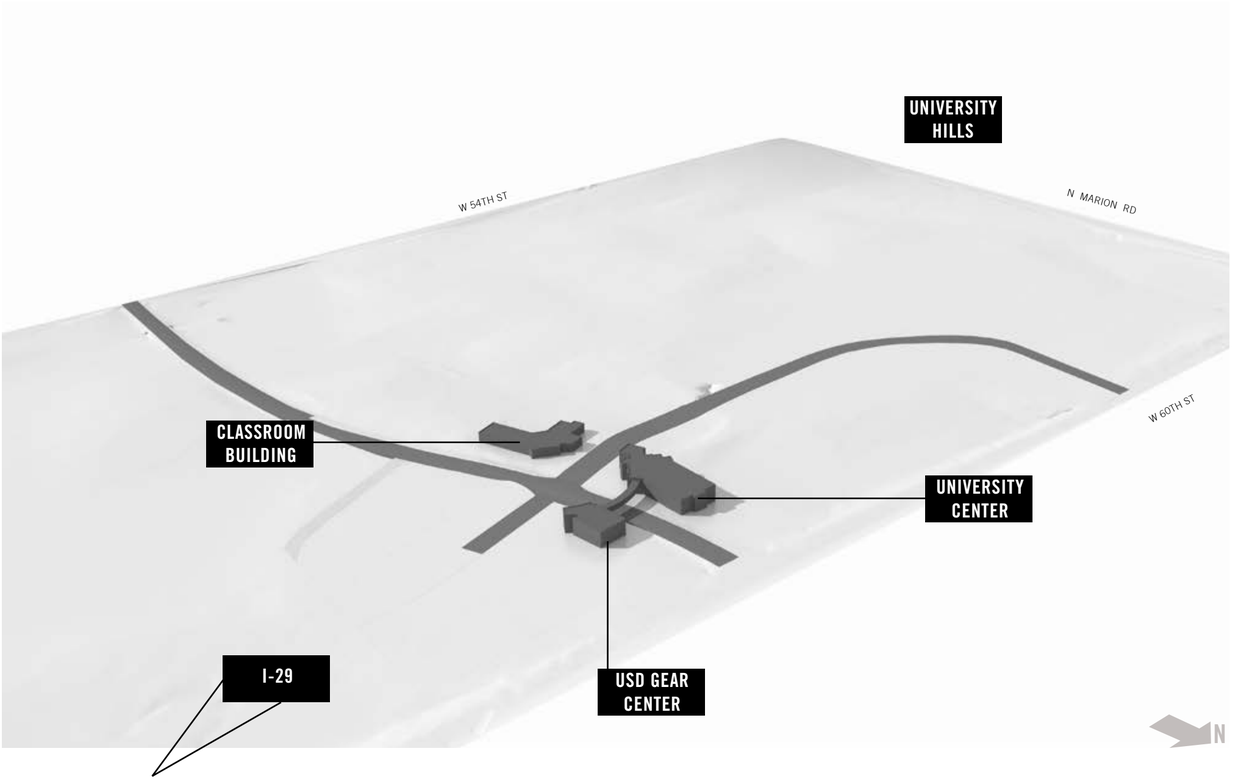
4. NEW DEVELOPMENT + STRUCTURED PARKING



UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

04

PLAN IMPLEMENTATION



PLAN PHASING

EXISTING

With multiple stakeholders, and fluctuating market conditions, the Discovery District must be flexibile in its approach to implementation. While the emphasis is on science and technology research, it is important to develop services in conjunction with the core uses in order to create a diverse and vibrant District. Phasing focuses on developing a strong central identity for the District while also allowing growth to occur organically over time. The growth projections are based on numerous factors including future building program, infrastructure improvements, existing building life spans and other critical relationships. Each phase has multiple components allowing for options on building type and schedule.

Initial investment is focused on developing the research element within the District. Subsequent phasing expands its focus towards building a concentration of activity and shared resources. Significant infrastructure, including stormwater upgrades and public space delineation, are targeted early to allow future flexibility and to quickly define a sense of place for the District.

The Master Plan phasing includes the District as well as the larger Board of Regents property to ensure that the mix of uses is well-balanced for the entire 252-acre site. These phases are not tied to a specific time frames as the project will ultimately unfold due to both internal and external conditions.

PLAN PHASING
STAGE ONE

The initial phase of development is infrastructure-focused. The realignment of the existing curved parking drive will maximize the development area along the future Activity Corridor. Its conversion from a rural road prototype to a new 1,300 linear foot street will also include new utilies and services necessary to organize and serve this District. The revised alignment utilizes the existing connection points at Career Avenue and N. Annika Avenue at 60th Street. New infrastructure shall include sanitary and stormwater, electrical, communications, and the potential for chilled and recyclable and potable water. An enhanced public realm with street trees, wide sidewalks and wayfinding signage will clearly define the pedestrian space.

An additional step that may be taken during Stage One is the initial development of the the Greenway amenity. This project would be completed in partnership with the City of Sioux Falls.

PLAN PHASING

STAGE TWO

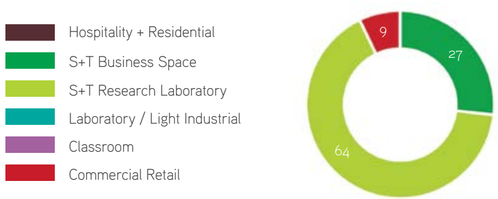
NEW DEVELOPMENT, BY USE

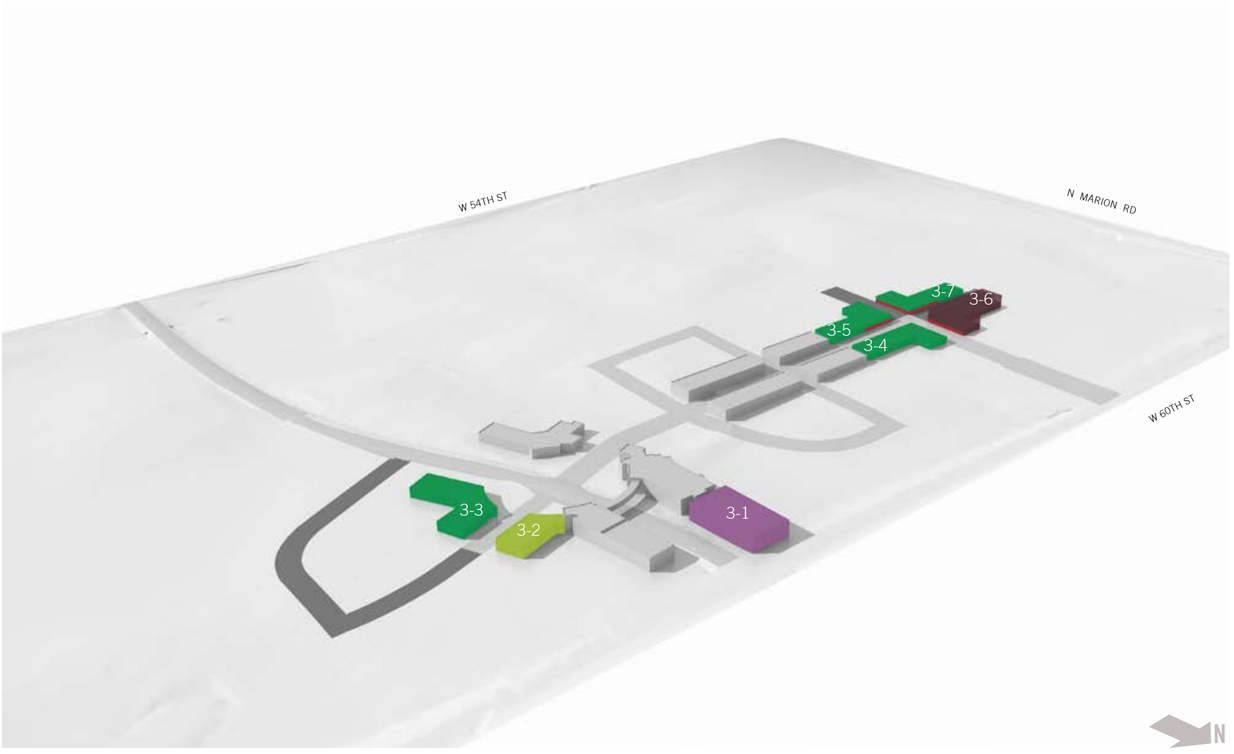
USES	STAGE 2 GSF	CUMULATIVE SF	PERCENTAGE
Hospitality+Residential			
S+T Business Space	50,440	50,440	27%
S+T Research Laboratory	118,320	118,320	64%
Laboratory / Light Industrial			
Classroom			
Commercial Retail	16,810	16,810	9%
TOTAL	**185,570**	**185,570**	**100%**

NEW DEVELOPMENT, BY BUILDING

BLDG	GSF	GSF	GSF	GSF	GSF	GSF	GSF
2-1	23,000			23,000			
2-2	47,660			47,660			
2-3	47,660			47,660			
2-4	33,760		25,320				8,440
2-5	33,490		25,120				8,370
TOTAL	**185,570**		**50,440**	**118,320**			**16,810**

USE PERCENTAGE, THIS STAGE





PLAN PHASING

STAGE THREE

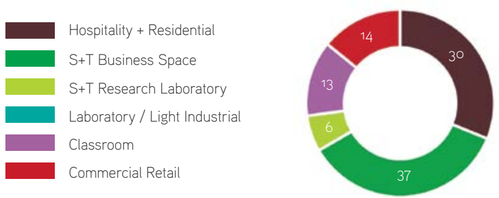
NEW DEVELOPMENT, BY USE

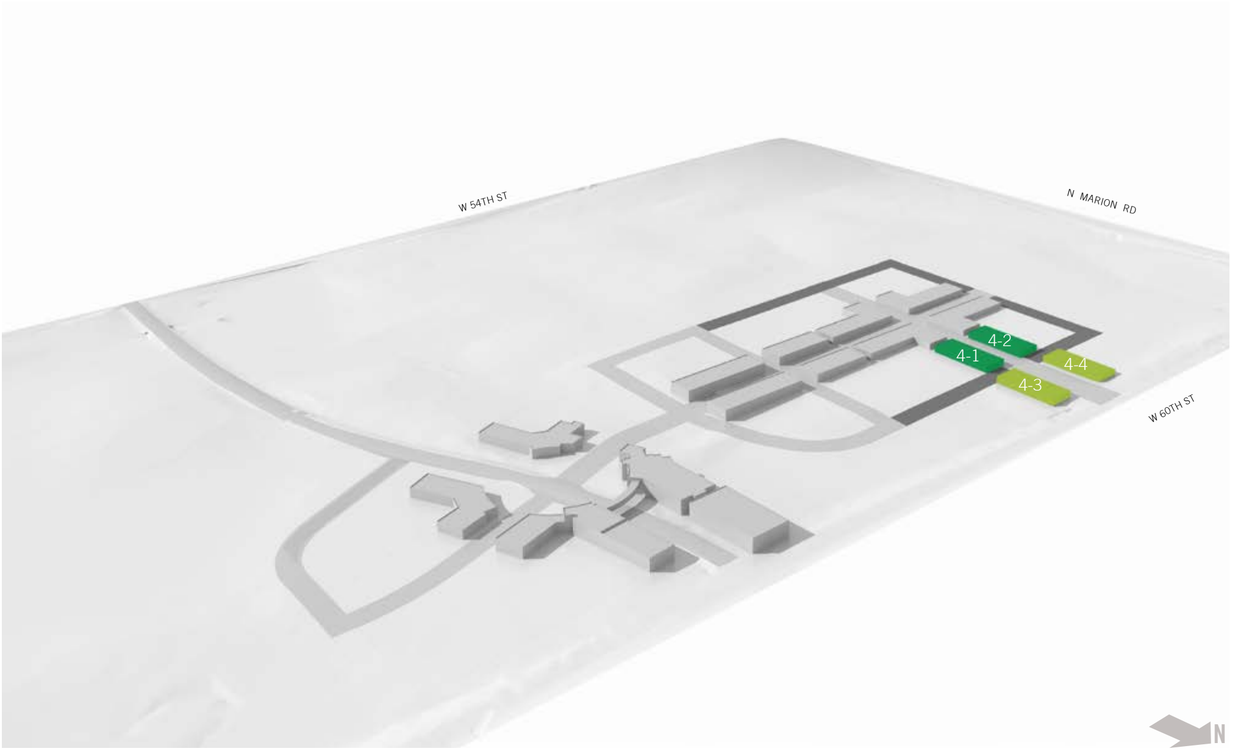
USES	STAGE 3 GSF	CUMULATIVE SF	PERCENTAGE
Hospitality+Residential	122,100	122,100	30%
S+T Business Space	148,210	198,650	37%
S+T Research Laboratory	24,110	142,430	6%
Laboratory / Light Industrial			
Classroom	52,800	52,800	13%
Commercial Retail	54,240	71,050	14%
TOTAL	**401,460**	**587,030**	**100%**

NEW DEVELOPMENT, BY BUILDING

BLDG	GSF	GSF	GSF	GSF	GSF	GSF	GSF
3-1	52,800					52,800	
3-2	24,110			24,110			
3-3	26,110		26,110				
3-4	54,260		40,700				13,560
3-5	54,260		40,700				13,560
3-6	135,660	122,100					13,560
3-7	54,260		40,700				13,560
TOTAL	**401,460**	**122,100**	**148,210**	**24,110**		**52,800**	**54,240**

USE PERCENTAGE, THIS STAGE





PLAN PHASING

STAGE FOUR

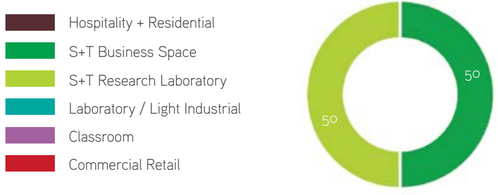
NEW DEVELOPMENT, BY USE

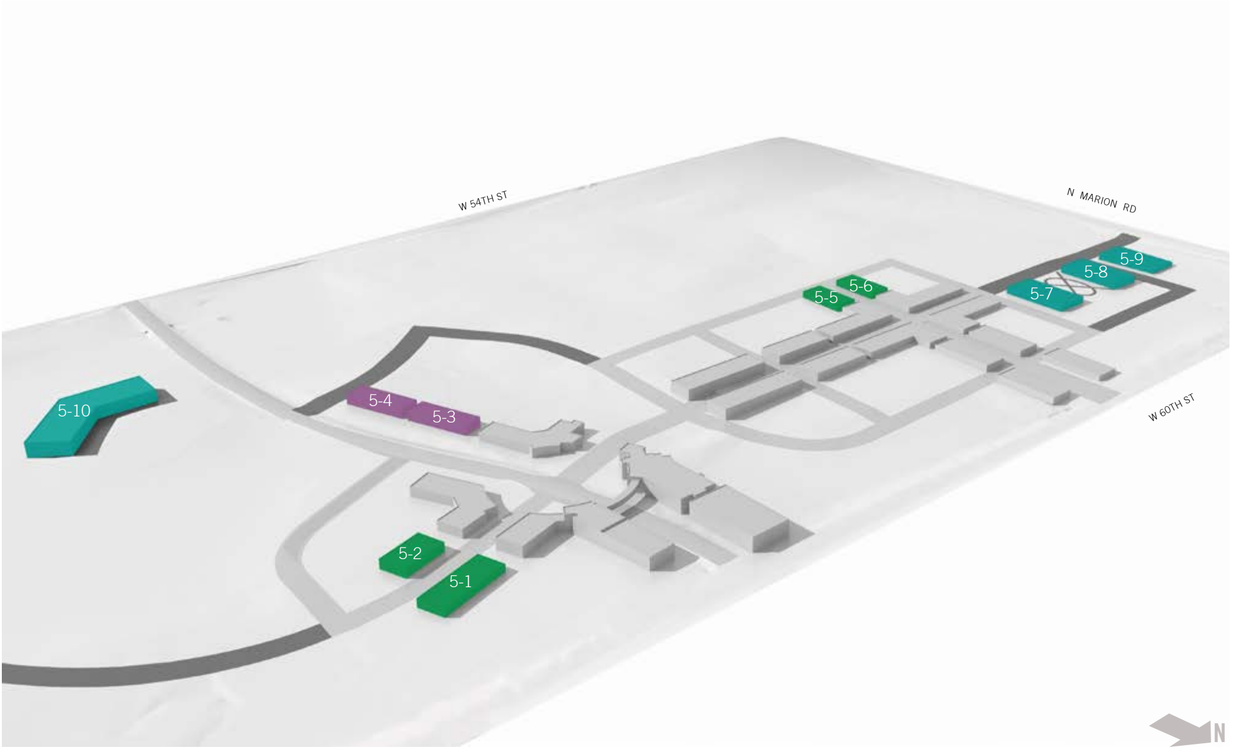
USES	STAGE 4 GSF	CUMULATIVE SF	PERCENTAGE
Hospitality+Residential		122,100	
S+T Business Space	64,040	262,690	50%
S+T Research Laboratory	64,000	206,430	50%
Laboratory / Light Industrial			
Classroom		52,800	
Commercial Retail		71,050	
TOTAL	**128,040**	**715,070**	**100%**

NEW DEVELOPMENT, BY BUILDING

BLDG	GSF	GSF	GSF	GSF	GSF	GSF	GSF
4-1	32,020		32,020				
4-2	32,020		32,020				
4-3	32,000			32,000			
4-4	32,000			32,000			
TOTAL	**128,040**		**64,040**	**64,000**			

USE PERCENTAGE, THIS STAGE





PLAN PHASING

STAGE FIVE

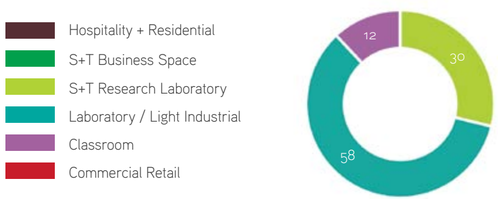
NEW DEVELOPMENT, BY USE

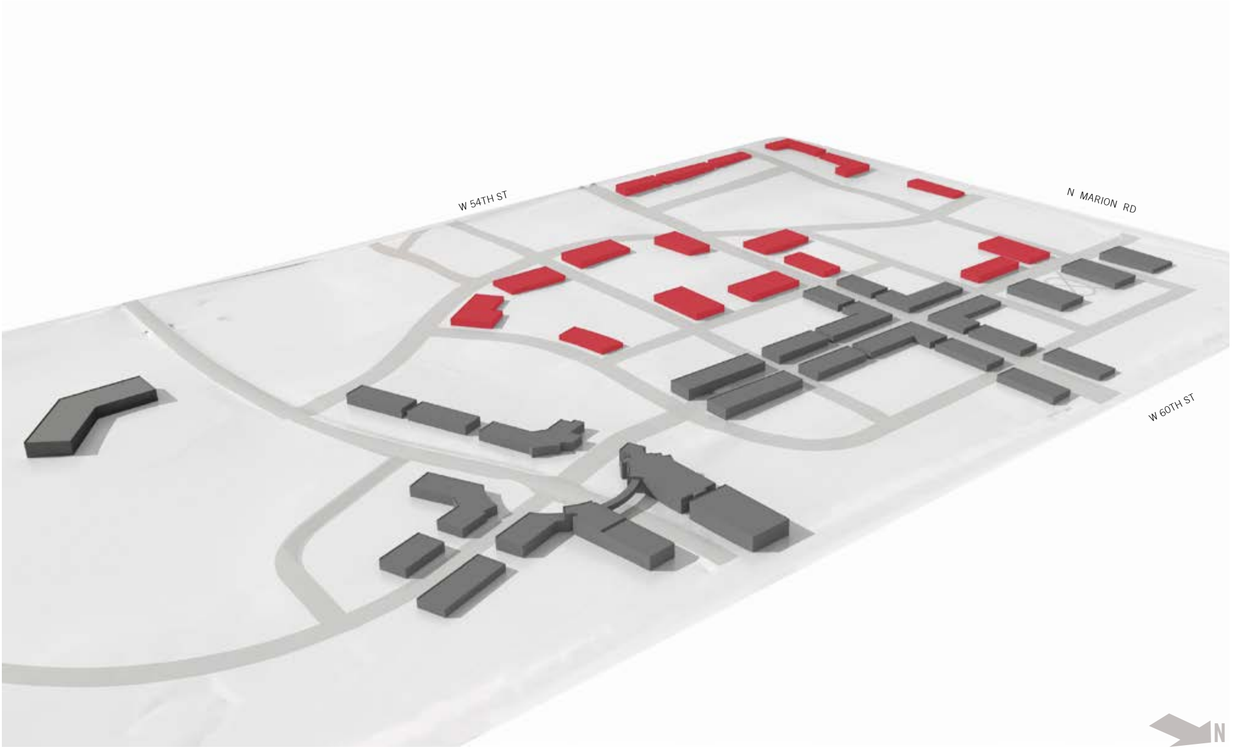
USES	STAGE 5 GSF	CUMULATIVE SF	PERCENTAGE
Hospitality+Residential		122,100	
S+T Business Space		262,690	
S+T Research Laboratory	134,820	341,250	30%
Laboratory / Light Industrial	261,600	261,600	58%
Classroom	53,680	106,480	12%
Commercial Retail		71,050	
TOTAL	**450,100**	**1,165,170**	**100%**

NEW DEVELOPMENT, BY BUILDING

BLDG	GSF	GSF	GSF	GSF	GSF	GSF	GSF
5-1	47,020			47,020			
5-2	35,780			35,780			
5-3	26,840					26,840	
5-4	26,840					26,840	
5-5	26,010			26,010			
5-6	26,010			26,010			
5-7	52,800				52,800		
5-8	52,800				52,800		
5-9	52,800				52,800		
5-10	103,200				103,200		
TOTAL	**450,100**			**134,820**	**261,600**	**53,680**	

USE PERCENTAGE, THIS STAGE





PLAN PHASING
FUTURE

Future development will occur beyond the boundaries of the District. While the framework established by the Master Plan will project future right-of-ways and public amenities, individual parcels should vary from the development pattern of the District. The framework allows flexibility in how future development is delivered.

While some interior parcels of the larger parcel will relate to the District, future buildings on the edges shall focus on engaging the surrounding community both in physical form and use. These parcels shall include a mix of uses.

NEW DEVELOPMENT, BY USE

USES	TOTAL SF	PERCENTAGE
Hospitality+Residential	122,090	10%
S+T Business Space	262,670	22%
S+T Research Laboratory	344,320	30%
Laboratory / Light Industrial	261,600	23%
Classroom	106,490	9%
Commercial Retail	71,070	6%
TOTAL	**1,168,272**	**100%**

USE PERCENTAGE, WITHIN THE DISTRICT

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

05

DEVELOPMENT GUIDELINES

URBAN DESIGN GUIDELINES

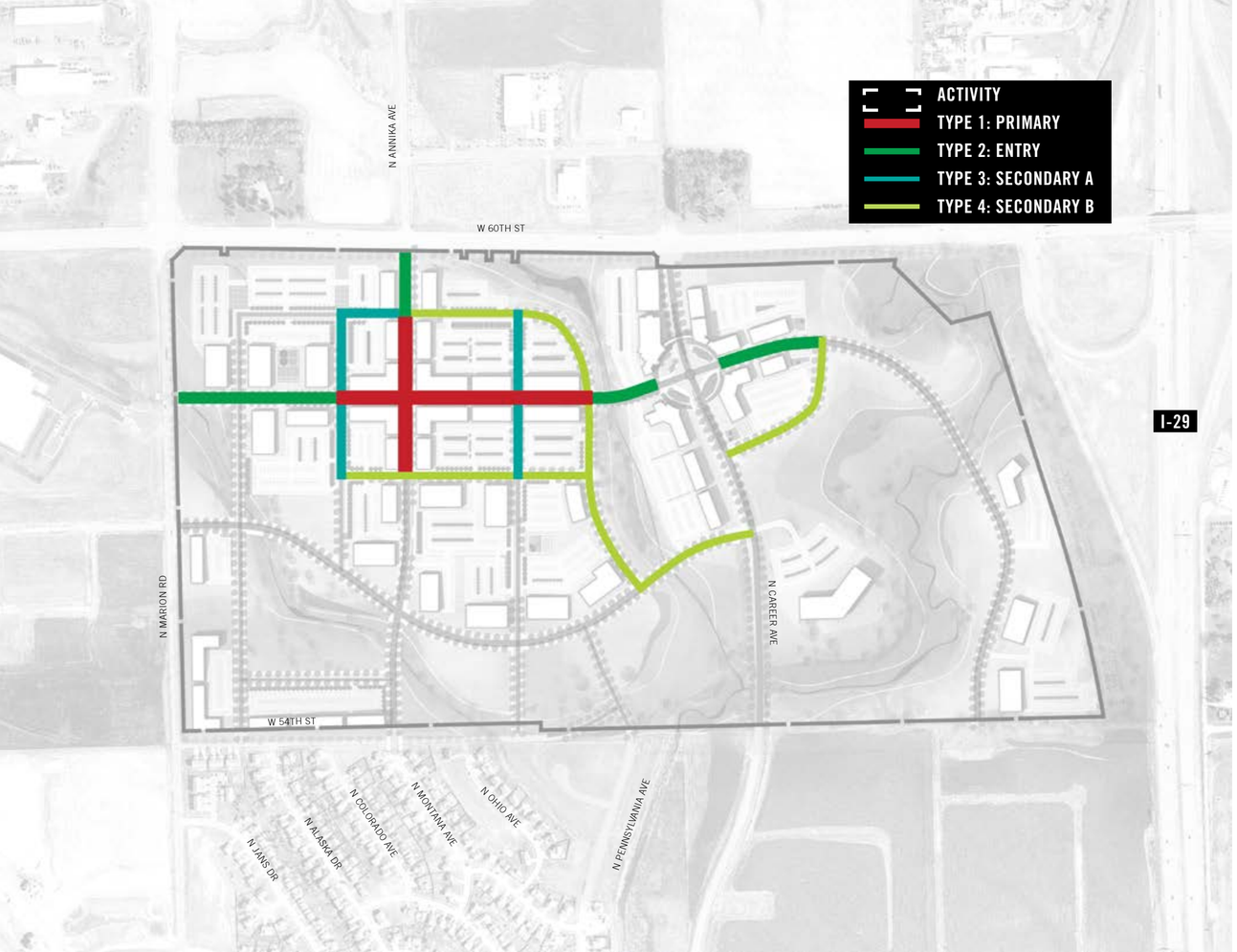
The primary act of city building, whether for a new city or a science district, is the creation of the physical public realm. This act deals specifically with the conversion of land into an urban framework of streets and infrastructure, public spaces and buildings, and block and lot configurations including their development regulation. The Urban Design Guidelines will ensure that specific designs implemented within the Master Plan framework will result in a consistent design relative to each stage of development and to form a coherent identity as a whole. These guidelines are intended to be a living document that supports innovation, sustainability, safety, flexibility and evolving uses, while enhancing the visual and civic integrity of the District and the surrounding areas.

The guidelines have been developed to refecernce Sioux Falls' new zoning ordanice. Adopted in April of 2014, the "Shape Places" Ordinance was developed to both bring continuity between the City's zoning ordinance and and its Shape Sioux Falls 2035 Comprehensive Plan. The goal of the new ordinance was to bring clarity to permitted uses and development requirements while creating institutional flexibility in an effort to streamline the development process and removing obstacles to discouraging development that is clearly in the community's best interest.

With the exception of a small section along the existing creek that is zoned as a Conservation district (CN), the 252-acre site falls into two zoning districts: S-2 (Campus Institutional, PUD), Form BCF_3 (Business and Community Facilities) for the area of site west of Career Ave and I-1 (Light Industrial) , Form WM1 (Warehouse and Manufacurting - Light) for the area west of Career Ave. S-2, BCF_3 allows for moderate to large institutions while I-1 (Light Industrial) allows large office parks and industrial uses where all impacts are generally contained with a building. The chart on the following page summarizes the wide range of uses allowable on the site by both zoning districts. This allowable uses are further expanded by uses allowed by special permit. This range of uses is capable of accommodating the type of development propose by the Master Plan.

PERMITTED USES BY CURRENT ZONING DISTRICT

	S-2 , BCF3			I-1, WM1		
USES	PERMITTED	ALLOWABLE	SPECIAL	PERMITTED	ALLOWABLE	SPECIAL
Office	•				•	
Hospital	•				•	
Research Facility	•				•	
College	•				•	
University	•				•	
Post High School	•				•	
Middle/High School	•				•	
Elementary School	•				•	
Recreation Facility	•				•	
Private School	•				•	
Cultural Facility	•				•	
Places of Worship	•				•	
Public Service Facility	•				•	
Dwelling(s) Above the First Story	•				•	
Twin Home & Multi-family Dwellings		•				
Light Manufacturing - Processing & Assembly				•		
Light Warehouse & Freight Movement				•		
Public Assembly Facility			•			•
Day Care Center			•			•
Residential-compatible Self-storage			•			•
Hotel / Motel			•			•



STREETS

The goal is to provide a hierarchy of street types that will provide circulation alternatives, disperse traffic effectively and create a pedestrian-friendly street environment appropriate for the District uses. These guidelines provide an integrated circulation system to promote an effective, safe and convenient use of multiple modes of transportation including automobiles, public transit, pedestrians and bicycles. The specific design of these streets can be found in the Landscape Design Guidelines.

Street Types

- **Type 1: Primary -** based on a traditional "main street" retail corridor within the city. It is an active pedestrian and cycling environment that also addresses increased vehicular activity.
- **Type 2: Entry -** urban in character, with wide sidewalks for pedestrian activity, as providing appropriate context to move local traffic while enhancing the pedestrian and biker experience.
- **Type 3: Secondary A -** encourage low-speed traffic; provide access to off-street parking.
- **Type 4: Secondary B -** encourage low-speed traffic; provide access to off-street parking.


DISCOVERY DISTRICT
UNIVERSITY OF SOUTH DAKOTA

BUILDINGS

Height: Minimum two, occupied stories. Mechanical equipment, including penthouses, is not included.

Fenestration: Defines the minimum amount of windows and/or doors fronting the street. A minimum amount of fenestration is important in that it reveals interior uses of buildings and assists in activating streets.

- Fronting Primary Streets: 70%
- Fronting Other Streets: No minimum

SETBACKS

Buildings fronting Primary and Entry Streets:

- Front yard build-to line (as measured from the face of street curb): 25 ft
- Side yard: 0-10 ft
- Rear yard: 20 ft

Non-Primary Street fronting parcels:

- Front yard: 35 ft
- Side yard: 20 ft
- Rear yard: 40 ft

LOT COVERAGE

Lot coverage is defined as building coverage and areas related to parking including parking lots, drives and service areas. Pedestrian areas are excluded from lot coverage consideration.

- 80% if adjacent to Primary Streets
- 60% if adjacent to Non-Primary Streets

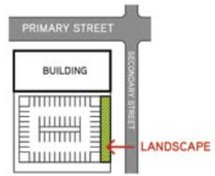
PARKING

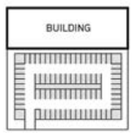
Location: Shall not be located between a Primary Street and a building.

Ratio: Refer to the underlying zoning. Parking within the District shall have minimum and maximums. Individual parcels that do not meet the requirement may use the average of the District to meet the parking requirements. The use of the average ensures that excessive parking is not developed within the District. Shared parking is strongly encouraged. The target parking ratio for the District is 1 parking space per 400 square feet of development.

Materials: Drive lanes are to be impervious surface. Parking spaces, wherever possible, should implement pervious materials such as permeable pavers for example.

Planting: Constructed parking islands consisting of planted or vegetated areas can assist in stormwater drainage and are highly encouraged. Tree planting should be included. Island should occur at a ratio of 1 island for every 8 parking spaces.



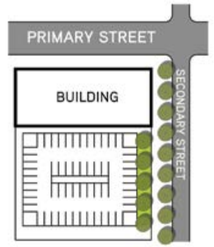


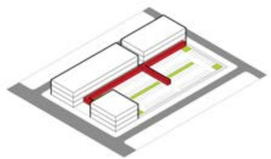
WIND ROWS

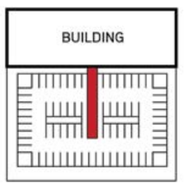
Due to the potential for strong, prevailing winds, pedestrian protection should be a priority for consideration. Two potential strategies are recommended.

Landscape Rows: where possible use of landscape design, particularly tree plantings, is the most effective way to screen pedestrians from strong winds.

Architectural Awnings: where planting is not possible or feasible, constructed awings can be used to protect pedestrians from exposure. Careful consideration should be given to the design detail and material selection to integrate awnings with the buildings they serve.







BUILDING PERFORMANCE GUIDELINES

Research buildings are complex projects with myriad requirements for programming, spatial relationships, and technical requirements. They require an intensity and rigor in design and execution that is beyond most conventional buildings. And when these buildings are located collectively, in a district or park, the success of each is reinforced by the success of its neighbors.

INTEGRATED DESIGN PROCESS

More than any specific requirement or set of guidelines is the notion that collaboration is critical to the successful operation of research buildings. There are many ways to foster this among the designers, constructors and users of the facilities. Buildings today, especially research laboratories, are complex pieces of machinery with many parts - some moving, some static - but all requiring careful attention. The design of these buildings requires different kinds of expertise: architectural, site planning, structural, HVAC and plumbing. Relying upon a multi-disciplinary and collaborative team, the Integrated Design Process provides a means to explore and implement sustainable design principles effectively on a project while staying within budgetary and scheduling constraints.

DESIGN FOR COLLABORATION AND INTERACTION

Interdisciplinary research is fundamental to the basic programming strategy of the research facilities. Labs and collaborative spaces should be designed to support human interaction and encourage cross-pollination among disciplines. Work areas should be flexible, inviting and provocative. Open spaces, rather than cubicles, should be filled with energy and activity. Generous space and equipment are dedicated to collaborative work. Each floor features conference and seminar rooms, and a restaurant and coffee shop beckon interaction. At its core, each building design should recognize that gatherings in social settings are profoundly important science incubators.

ADAPTABILITY

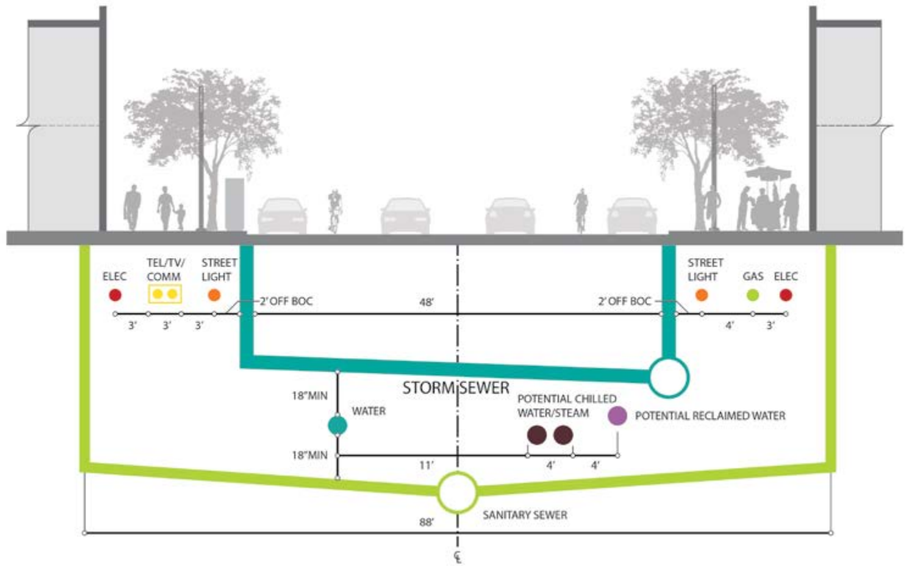
Another key element of research buildings is adaptability. As the laboratory is being re-evaluated the focus is now on the project team and the process used to conduct research which can change almost daily. The focus is no longer on the amount of net square feet or linear feet of bench required. The laboratory space will be flexible and adaptable enough to support the research teams, designed for change and allowing individual lab groups to rearrange their labs to suit their needs.

HIGH-PERFORMANCE BUILDINGS

Sustainable considerations are critical to the success of the project and there are a number of strategies for increasing the sustainable operation of the buildings. Factors that should be considered include: orientation, sunshading and daylighting, chilled beams, radiant ceilings, airflow sampling, energy recovery and energy star equipment. Buildings should be individually metered to verify performance.

LEAN MANAGEMENT PROCESS

The research industry is beginning to re-evaluate the way it works and is attempting to be more scientific in its research process. Research buildings should be designed leaner – at least 65% efficient to use the facilities more effectively and have less wasted space. Warehouse storage facilities within or near the District could bring supplies in each day. This means research buildings should be used more for research and less for storage. Less storage will provide more flexibility to change and accommodate the research programs.



INFRASTRUCTURE GUIDELINES

Elements such as underground sewer pipes, overhead power lines, and cell phone towers often go unnoticed by the people they serve but a great deal of effort is required to ensure that the infrastructure necessary to meet projected growth and development is constructed and maintained in a timely fashion. The District must be able to carefully balance between the timely expansion of infrastructure and services with the availability of funds for this purpose.

City utilities, including water and sanitary sewer, are located in close proximity to the proposed Discovery District development. There is an 8-inch water main on the east end of the Primary Street and a 16-inch water main on the south side of 60th Street that will be extended down Annika Avenue to complete the looped system.

Sanitary sewer will serve the District by extending an 8-inch pipe on the Primary Street from the existing sanitary sewer trunk system located west of the District. Other private utilities including communication lines, gas and electric are located in the public right-of-ways in close proximity to the District.

Drainage piping, inlets, storage and treatment facilities will be designed with the other infrastructure improvements. Runoff water will flow toward the south and southeast to the major drainage channel located approximately 2,000 feet from the site.

The Discovery District is envisioned as a District that will accommodate the demand of all potential users. The system of utilities is envisioned as a highly functioning infrastructure backbone that will allow development to occur with minimal difficulty, ensuring efficient and appropriate interaction and support for future development.

LANDSCAPE GUIDELINES

The Landscape Design Guidelines will ensure that specific designs implemented within the Master Plan framework will result in a consistent design relative to each stage of development and to form a coherent identity as a whole. In general, new construction should reflect its time, while sharing a commonality of massing, character, high quality design, composition and complimentary materials within the District. These guidelines are intended to be a living document that supports innovation, sustainability, safety, flexibility and evolving uses, while enhancing the visual and civic integrity of the District and the surrounding neighborhoods.

The vision includes the restoration of some of the prairie and oak savanna landscapes common to South Dakota. The design principles, incorporating sustainability, habitat creation, and ecological preservation for future generations, provide for the recreation and management of the open prairie and oak savanna landscape patterns.

The following design principles are meant to guide the landscape development in order to achieve the overall character of the District:

- Restore the natural, pre-settlement landscape of prairie and oak savanna into the larger open areas of the site, providing visual relief and reinforcing a sense of place
- Provide a seamless relationship between the openness of the natural open spaces and the built form
- Provide natural outdoor venues for education and interpretive opportunities
- Promote well-connected design of public realm that will foster active, comfortable and pleasant places for pedestrian movement and community gathering
- Promote the use of street trees and other plantings within the public realm to provide comfort for the pedestrian, increase permeability in the public landscape, creating an identity for the District that integrates landscape with the built environment
- Ensure attractive settings and open spaces are provided in conjunction with new buildings and infrastructure improvements
- Maintain a selective palette of indigenous and site-adaptive plant species appropriate to the Sioux Falls area
- Promote the use of colors, textures, and patterns to incorporate soft and hardscape materials complimenting the landscape designs proposed
- Implement public art at points of interest within public and private spaces

HIERARCHY OF STREETS

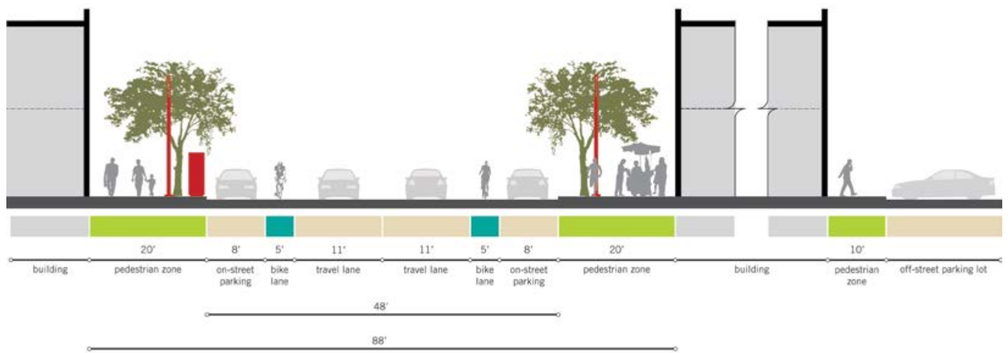
The goal is to provide a hierarchy of street types that will provide circulation alternatives, disperse traffic effectively and create a pedestrian-friendly street environment appropriate for the District uses. These guidelines provide an integrated circulation system to promote an effective, safe and convenient use of multiple modes of transportation including automobiles, public transit, pedestrians and bicycles.

TYPE 1: PRIMARY STREET

Primary Streets are defined by the buildings that line them. Main entrances should front on these streets and open directly onto sidewalks. Pedestrians on the street should be able to see the activities inside buildings through transparent windows and doors. The sidewalks should provide a variety of seating options. The design of the Primary Street should accommodate snow plowing. Low maintenance vegetation that can resist de-icing agents and foot traffic is required.

Specific Recommendations:

- Sidewalk Character: street trees spaced 30 feet O.C. located within tree wells with pedestrian scaled light fixtures, special paving treatment where appropriate, signage and site furnishings.
- Suggested Streetscape Furnishings: seating, bicycle racks, waste receptacles, bollards, public art, and defined dining seating areas.
- Specialty paving at major intersection of N. Annika Avenue east-west extension.
- Incorporate pedestrian wayfinding signage.

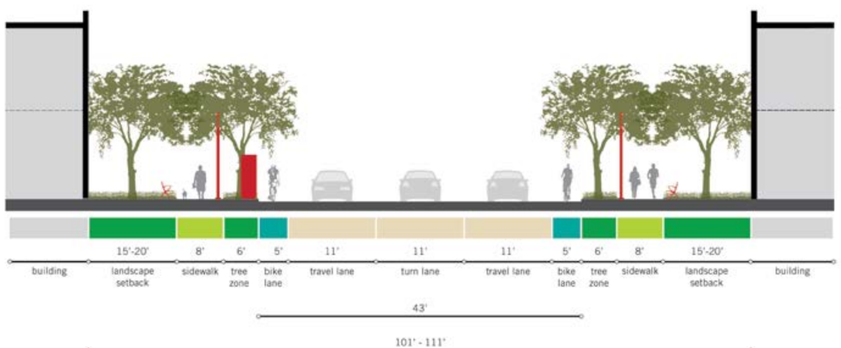


TYPE 2: ENTRY STREET

Entry Streets facilitate movement, provide places for activity to occur, define edges and open spaces and connect places within the District. The Entry Street is urban in character, with wide sidewalks for pedestrian activity, as providing appropriate context to move local traffic while enhancing the pedestrian and biker experience. Entry Streets provide shade trees and incorporate stormwater management through multi-functional landscape features.

Specific Recomendations

- Sidewalk Character: street trees spaced 30 to 40 feet O.C. (in a 6-foot tree planting zone), pedestrian scaled light fixtures, signage and site furnishings.
- Suggested Streetscape Furnishings: seating, bicycle racks, waste receptacles, bollards, public art, etc.
- Opportunity to incorporate pedestrian wayfinding signage.

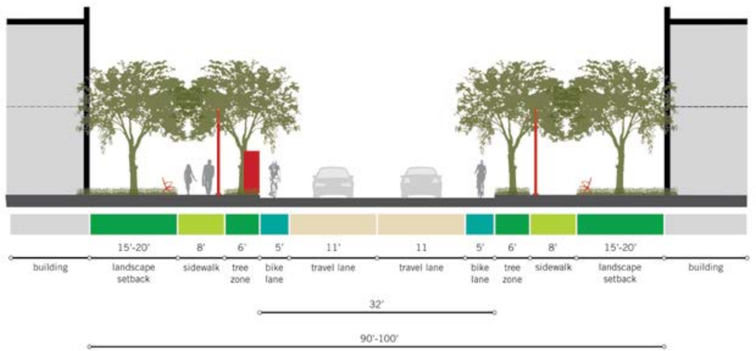


TYPE 3: SECONDARY STREET A

Secondary Streets shall encourage low-speed traffic. Off-street parking and loading throughout the District is accessed from secondary streets. The number of parking and service entry points are intentionally minimal to minimize the impact on the public realm.

Specific Recommendations:

- Suggested Streetscape Furnishings: seating, bicycle racks, waste receptacles, etc.
- Opportunity to incorporate pedestrian wayfinding signage.
- Understory plantings may be less formal than Main or Entry Streets.

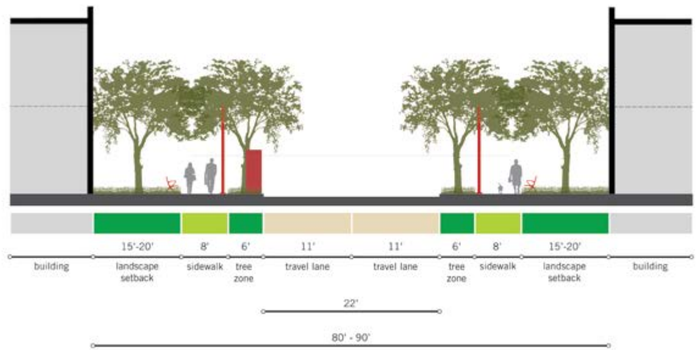


TYPE 4: SECONDARY STREET B

Secondary Streets shall encourage low-speed traffic. Off-street parking and loading throughout the District is accessed from secondary streets. The number of parking and service entry points are intentionally minimal to minimize the impact on the public realm.

Specific Recommendations:

- Sidewalk Character: street trees spaced 30 to 40 feet O.C. in a landscaped tree planting zone, pedestrian scaled light fixtures, signage and site furnishings
- Suggested Streetscape Furnishings: seating, waste receptacles, etc.
- Opportunity to incorporate pedestrian wayfinding signage.
- Understory plantings may be less formal than Primary or Entry Streets.



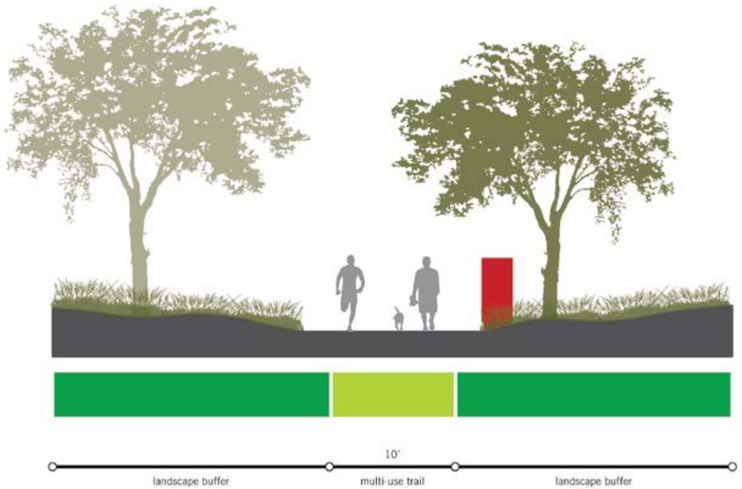
PATH AND BIKE SYSTEM

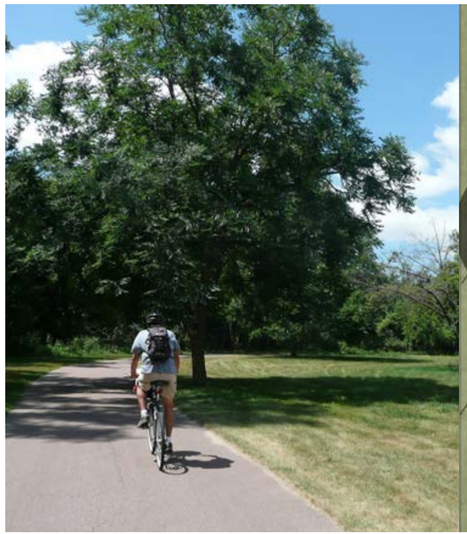
Paths provide safe and convenient access to parks, open spaces, neighborhoods, community centers and regional destinations. Workforce, visitors and residents of the District shall benefit from a complete and connected system of sidewalks, trails and bikeways for leisure use and transportation.

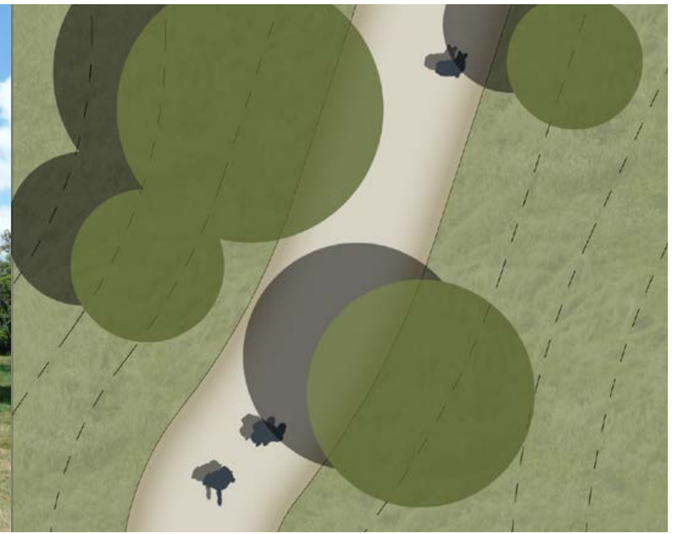
Path users have differing needs depending on their skill levels and purposes for using the system. These paths should be designed for recreation, service and emergency access as well as alternative routes for a combination of pedestrians and cyclists to move throughout the District with minimal road crossings. The path system should connect via regional trail systems to other local destinations and services.

Specific Recommendations for Paths:

- Provide holistic, safe and integrated system accessible for a variety of uses and users.
- Design and place to reduce trail/human visibility in sensitive areas.
- Manage use and vegetation to minimize impacts on natural systems.
- Design to accommodate occasional maintenance and emergency vehicles.
- Connect with existing or proposed future neighboring trails and paths.
- Provide adequate and conveniently located bicycle parking racks to encourage bicycle use.
- Design and implementation shall conform to American with Disabilities Act Accessibility Guidelines.
- Refer to the most current version of AASHTO's Guide for the Development of Bicycle Facilities.







SHARED USE PATH

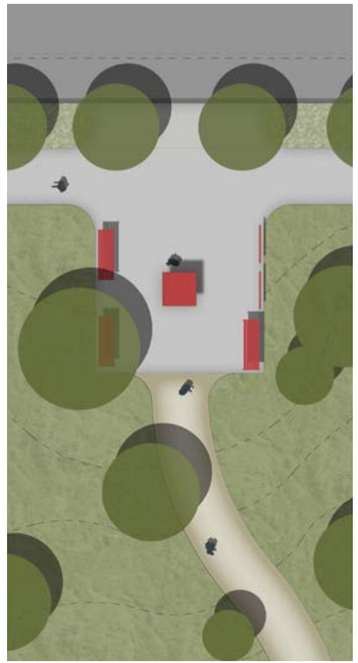
A Shared Use Path is a bikeway outside the traveled way that is physically separated from motorized vehicular traffic by an open space or barrier and within the highway right of-way or an independent alignment. Shared Use Paths are also used by pedestrians (including skaters, users of manual and motorized wheelchairs and joggers) and other authorized motorized and non-motorized users.

ON-STREET BIKE LANES

Designated exclusively for bicycle travel, bicycle lanes are separated from vehicle travel lanes with striping and are indicated by pavement stencils and signage. The lanes are intended to increase the comfort of bicyclists and remind motorists that bicyclists have a right to the road.

OUTDOOR GATHERING AND OPEN SPACES

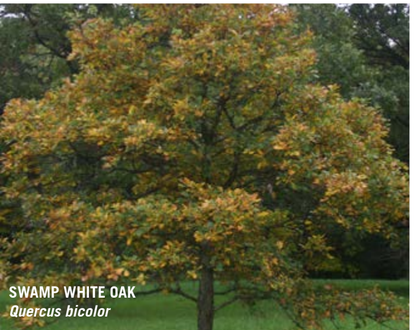
Midwestern cities and districts have traditionally featured plazas and gathering spaces. The design of outdoor spaces should foster social gathering and establish and reinforce the District's identity. The inclusion of outdoor plazas, courtyards, natural open spaces, etc. as public and quasi-public spaces should be utilized to bind various private and public spaces into cohesive, interrelated gathering areas wherever possible. Gathering spaces should encourage an environment where pedestrians are comfortable, safe and promote walkable opportunities within and adjacent to the District. Such parks and corridors with privately developed open space will also help complete linkages and organize development within the District.



GATEWAYS AND TRAILHEADS

Gateways and trailheads provide distinctive identity reflecting the urban character of the District. Implement gateway elements at key locations so that vehicular and pedestrian transit users can efficiently find their destinations. Specific recommendations for gateways and trailheads include:

- Provide views in multiple directions.
- Feature appropriately scaled wayfinding signage.
- Sidewalks and paths are wide enough to accommodate multiple directions in pedestrian flow.
- Sidewalks may feature a unique pattern with the use of pavers or concrete.
- Provide enhanced landscape material such as an alley of trees.



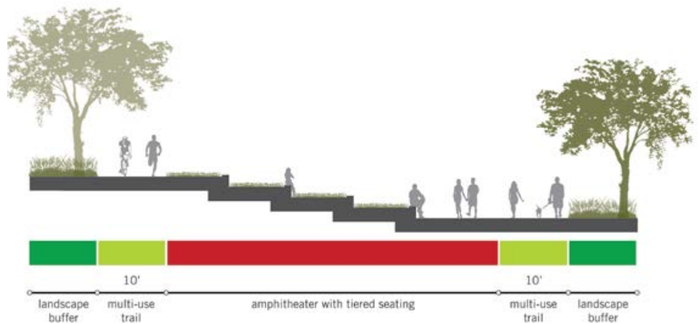
MATERIALS - STRUCTURED SPACES

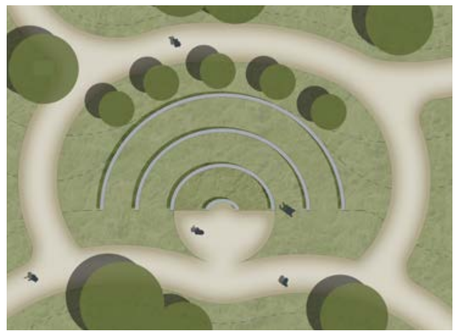
Located within the development core of the District, urban spaces refers to landscape materials within public realm and supporting private spaces. Planting design should utilize materials that are site appropriate and consider the location of adjacent walks and pedestrian spaces. Open lawns should be enhanced with large deciduous trees placed in an architectural manner. Plantings should screen winter winds from the north and west while more open areas should occur on the south sides of buildings.

In selecting planting materials, priority should be given to the use of native or adapted plants to limit maintenance and to emphasize developing a sustainable landscape. Where feasible, native grasses and "no mow" areas should be incorporated to limit maintenance and water use, filter stormwater, support fauna and provide an educational / research tool. Parking lots should include large shade trees every eight spaces to reduce the heat island effect and provide visual entrance.

Location:
Appropriate for use within linear spaces, architectural built form and higher density areas in the transition to open space landscapes.

Materials:
Recommended minimum caliper for shade trees: 4"
Recommended minimum size for shrubs: 24"

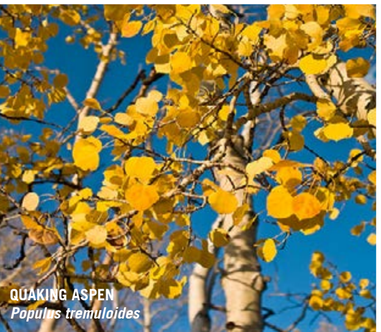




NATURAL OPEN SPACES

The recommended open space system for the District includes natural areas (existing or re-established) that are in contrast to the built environment. The greenway and surrounding undeveloped areas provides the structure for a contiguous system that distinguishes the southeastern edge of the District and connects to the neighboring communities. This area offers opportunities for quiet reflection and recreational interface with open space. Specific recommendations include:

- Restore the historical landscape patterns.
- Re-create the integrity of the ecology.
- Link natural areas to neighboring communities by the pedestrian path network.
- Provide human-scaled transitions from the built environment to the natural environment through paths, plantings or other landscape features.
- Incorporate natural areas to allow people to enjoy and interact with nature.



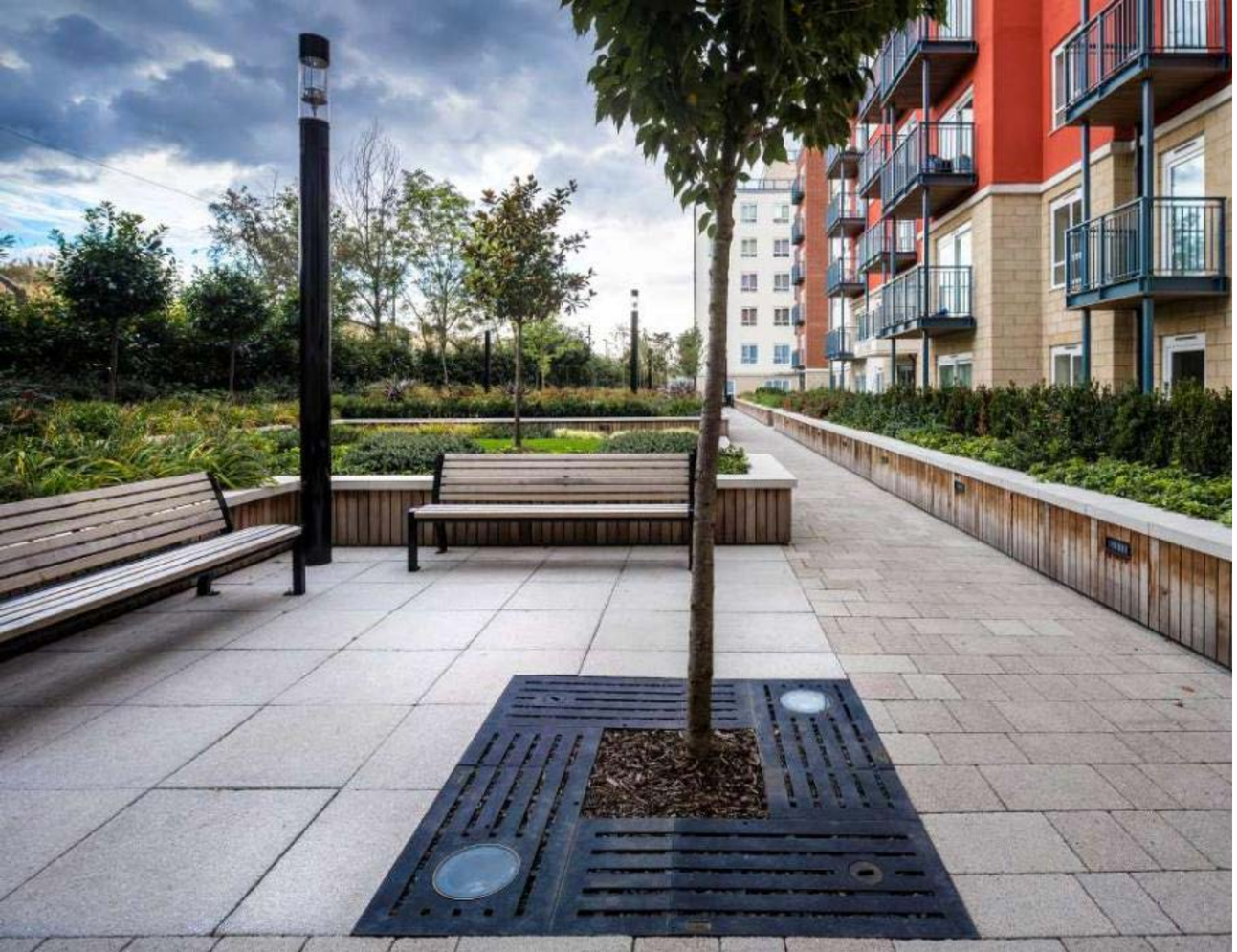
MATERIALS - NATURAL OPEN SPACES

The natural open landscape is based on the historical prairie and oak savana landscape of the region. This landscape pattern focuses exclusively on native and indigenous species. The individual landscapes should align with minimal interruptions to form a continuous mass of prairie grasses, shrubs and wildflowers. Specific recommendations include:

- Prairie parks should incorporate a system that identifies natural resource features.
- Incorporate varying densities of vegetation through the use of native plant material.
- Minimal use of trees to provide shade along the Paths.
- No manicured lawn.
- Informal appearance.
- Emphasis on grasses and texture.

Location:
The Natural Open Spaces landscape is appropriate for use at the fringes of the District's built form, bordering the areas common open spaces.

Materials:
Recommended minimum caliper for shade trees: 4"
Recommended minimum size for shrubs: 24"



SITE FURNISHINGS

The District shall promote a unified set of site furnishings. Site furnishings shall be selected based on consistency, quality of design and appropriate character materials for the District. Consistent use of standard furnishings builds a cohesive style and visual appearance. Contemporary style furnishings are encouraged to complement the District's wayfinding and signage.

BENCHES

Standard benches should be utilized to promote a unified district identity.
The recommended bench has aesthetic appeal, compatibility with the District architecture, quality and durability of materials. The standard bench shall include both backed and backless models that can be chosen to allow the in location and use. Specific recommendations include:

- Benches should be placed unobtrusively in exterior spaces and not interrupt traffic flow.
- Benches should be securely anchored to minimize theft and vandalism. All benches should be secured to a pad compatible to the adjacent pavement or anchored to concrete bases if set in a landscape area.
- Benches should be constructed with extruded and cast aluminum with a powder coated finish to complement wayfinding and signage.

WASTE AND RECYCLING RECEPTACLES

Waste and recycling receptacles should be located where needed, but should have minimal visual impact and relate to the placement of site benches, planters and lighting. Receptacles should be constructed with extruded and cast aluminum with a powder coated finish to compliment benches, bike racks and lighting.
Specific recommendations include:

- Locate at the intersections of major pedestrian corridors, public gathering areas and at building entries.
- The waste receptacles shall integrate recycling for paper, plastic and aluminum unless single stream recycling is available.
- The unit should be secured to discourage vandalism and to extend its life.
- Specify the cover to keep rainwater from infiltrating the receptacle and to maintain a neater appearance.
- Specify the interior liner to control insects and facilitate waste removal.

BIKE RACKS

Bicycle racks should be consistent in their design, material and color as well as in the detail for their installation and design of their layout. Bicycle racks should have little visual impact. The same make and model of unit should be used throughout the District. The standard model shall allow for simultaneous front and rear wheel locking. Specific recommendations include:

- Locate on paved surfaces.
- Locate under cover where possible.
- Incorporate bike parking into the building entrance site design and consider winter maintenance requirements with placement.
- Incorporate bike stations into the outdoor areas and/or path site design where possible.
- Locate bike stations in highly visible locations.

LIGHTING

Lighting function and aesthetics should be designed to enhance the District's image; it should also foster an enhanced nighttime experience for the District's users. The lighting must be designed to effectively light pathways, walkways, transit areas, and other outdoor active areas.

Light fixtures should be selected and located to develop a district hierarchy. Roadways and parking lots should be the first layer with uniform, low level lighting. Roadway intersections and crosswalks are a secondary level providing higher lighting levels that provide appropriate lighting for pedestrians in crosswalks. Tertiary levels include building entrances, exterior stair locations and exterior activity spaces.

District lighting should be environmentally sensitive to meet DSF and LEED standards including minimizing light trespass and pollution, and using minimal energy through lighting equipment selection and operation. LED lamps shall be selected to address and balance three primary concerns: lighting performance, energy efficiency and maintenance aspects. Ballasts, power generators and power supplies should all be capable of dimming the lamps. Specific recommendations include:

- Limit street and parking lot pole lights to 25 feet.
- Limit path pole lights to 12 feet.
- Select lighting equipment that has a shielded light source, minimizes glare and is dark sky compliant. Strictly limit the use of floodlights.
- Select lighting equipment with high cut-off characteristics and locations that minimize light trespass .
- Select lighting equipment that is dark sky compliant.
- Develop a network of "safe" sidewalks linking perimeter parking to destinations.

PUBLIC ART

The District shall consider the inclusion of a public art allocation as a part of all construction projects to fund art installations. Art shall be incorporated into the design of the Type 1 and Type 2 streetscapes, the greenway and as a focal point for the Career Avenue traffic circle. In addition, the pedestrian cover utilized in the various surface parking lots within the District shall incorporate art as a central element of the structure. Potential partners include the University of South Dakota's Fine Arts program as well as other universities, colleges and the local art community of Sioux Falls. Specific recommendations include:

- Streetscape elements and screening fence materials are encouraged to incorporate artistic design elements, forms, patterns, colors, lighting and materials that communicate district character and identity.
- Public art is encouraged in public plazas as gateways and along significant pedestrian streetscapes to create focal points, emphasize a gathering space, or communicate something about the character, identity or history of the place.

HARDSCAPE MATERIALS

Materials used in the District should carry high quality commonality throughout the District. The design of hardscape materials should maximize the amount of usable sidewalk space by utilizing tree grates or permeable unit pavers, for example, at the base of street trees. Low, raised planting beds are acceptable alternatives but should be designed and located to minimize impact on pedestrian flow. A change in scale and volume of use, however, calls for different textures, tones and applications.

WALLS

Walls can help describe the line between public and private spaces. They can also serve to showcase local materials and can be combined with a horizontal cap to provide additional seating, where appropriate.

PAVING

Pavement materials should be attractive, durable and low maintenance. A variety of special paving materials, patterns and colors are encouraged to emphasize significant intersections, plazas and building entries. Local materials and pervious pavement techniques should be utilized. The use of pervious pavers within surface parking lots is strongly encouraged for parking spaces but not for use within the drive lanes Unique paving patterns are a good method to help direct pedestrian and vehicular traffic.

SIGNAGE & WAYFINDING GUIDELINES

Beyond helping users effortlessly find their way with well-placed, readable messaging, signage can become the connecting fibers of a place, visually weaving together paths of travel and outdoor environments for enhanced user interaction.

Strategically planned wayfinding elements can challenge traditional interpretations of "signage," blurring the lines between form and function. These elements can drive additional user exposure to place differentiators including storytelling and public art substantially adding to the user's overall experience and opinions.

IDENTITY

- PRIMARY PROJECT ID
- SECONDARY PROJECT ID
- BUILDING ID (MAY BE UPPER LEVEL OR GROUND LEVEL)
- STREET ID

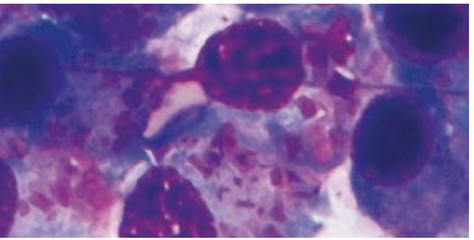
INFORMATIONAL / OTHER (TBD)

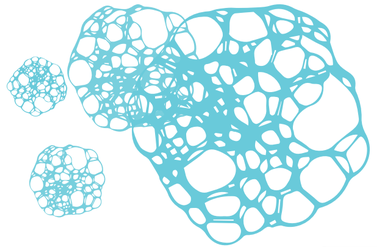
- SITE DIRECTORY / MAP
- PROJECT STORYTELLING
- PUBLIC ART
- REGULATORY

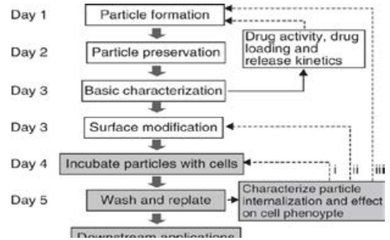
* Sign Location Key does not include state DOT required signage, federal MUTC devices, striping, etc...

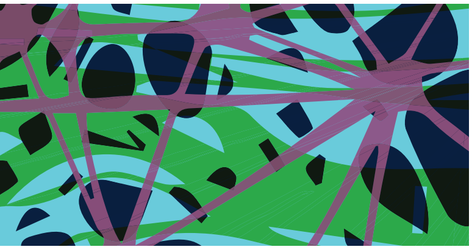
DIRECTIONAL

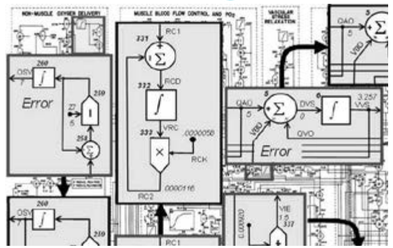
- PRIMARY VEHICULAR DIRECTIONAL
- SECONDARY VEHICULAR DIRECTIONAL
- PEDESTRIAN DIRECTIONAL

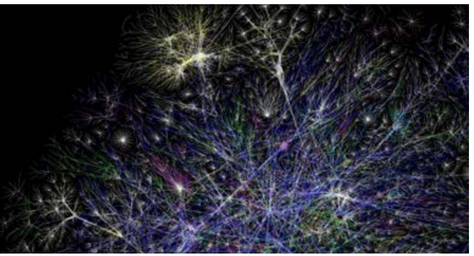












PATTERNING

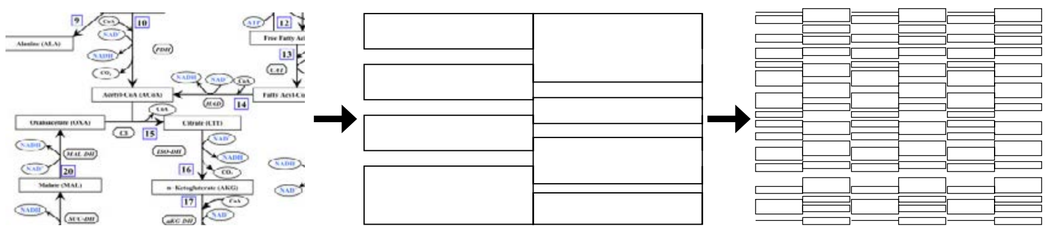
The broad practice area of bioengineering has expanded beyond large-scale efforts to include engineering at the molecular and cellular level with applications in energy and the environment as well as healthcare. It can include elements of electrical and mechanical engineering, computer science, materials, chemistry and biology.

This breadth affords multiple opportunities for visual inspiration. The following pages, explore a unique patterning opportunity. which may be extended further for integration into the landscaping, hardscaping and other built environment surfaces.

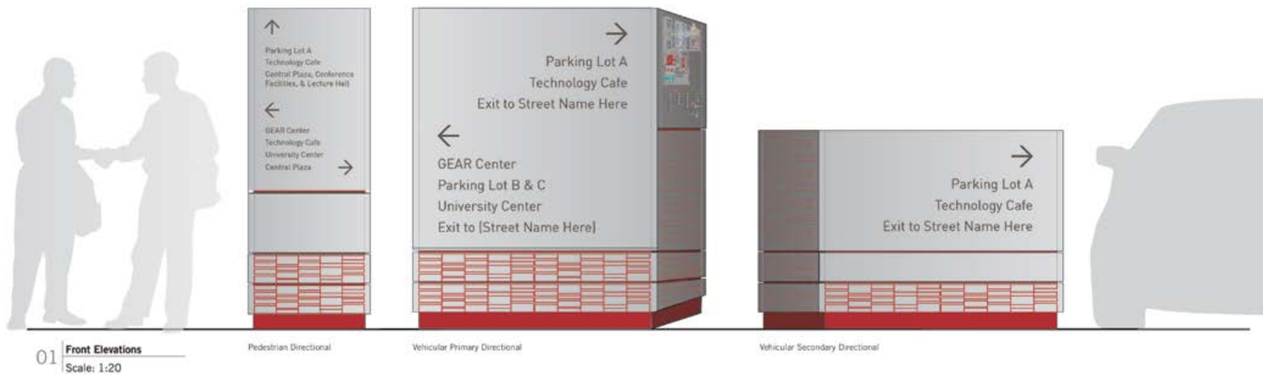
Emerging from the context of its environment, sign patterning at the Discovery District seeks to illustrate complex functions of the campus in a simplified, approachable language.

SIGNAGE

Signage design gets down to the basics. Acting is a direct descendent of diagramatic exercises which can develop as a part of bioengineering research process. At a most basic level, this pattern represents the rudimentary, but often overlooked building blocks of scientific research.



Pattern ONE / Inspiration



ARCHITECTURE AS A WAYFINDING TOOL

Studies have indicated that it is easier to recall the need to turn at a visual cue rather than having to reading a message on a sign. Focal points, art installations, repetitive follies, beacons and the architecture itself can become a simple, effective way to find one's way.

Physical structures provide placemaking opportunities for a richer, more memorable experience.

ART AS A WAYFINDING EXPERIENCE

Beyond helping users effortlessly find their way with well-placed, readable messaging, signage can become the connecting fibers of a place, visually weaving together paths of travel and outdoor environments for enhanced user collaboration.

Strategically planned wayfinding elements can challenge traditional interpretations of "signage," blurring the lines between form and function. This project element can drive storytelling and public art, substantially adding to the user's overall experience.

A successful wayfinding system thoughtfully addresses many different project needs.

UNIVERSITY OF SOUTH DAKOTA
DISCOVERY DISTRICT

PERKINS+WILL