

**University of Nebraska Board of Regents  
Board of Regents Meeting Itinerary**

**Friday, November 20, 2009**

10:00 a.m.

Board of Regents Meeting

1. Consideration of Nebraska Innovation Campus
  - Presentation by Chancellor Perlman, Mary Jukuri-JJR/Smithgroup, and Jay Noddle-Noddle Companies
2. Briefing on Budget
3. Public Comments on human Embryonic Stem Cell Research
4. Action on Resolution on human Embryonic Stem Cell Research

**AGENDA**  
**THE BOARD OF REGENTS**  
**OF THE UNIVERSITY OF NEBRASKA**  
**Varner Hall**  
**Friday, November 20, 2009**  
**10:00 a.m.**

I. CALL TO ORDER

II. ROLL CALL

III. APPROVAL OF MINUTES AND RATIFICATION OF ACTIONS TAKEN ON  
OCTOBER 23, 2009

IV. UNIVERSITY ADMINISTRATIVE AGENDA

B. BUSINESS AFFAIRS

University of Nebraska-Lincoln

1. Approve the Master Plan and Business Plan for Innovation Campus and authorize the President to submit the same as required by law and provide a commitment for the President to provide an annual update of the plans on behalf of the University to complete the University's obligations under Neb. Rev. Stat. § 2-113(2) (Supp. 2009) Addendum IV-B-1

V. PUBLIC COMMENT

The Standing Rules of the Board provide that any person may appear and address the Board of Regents on any item on the agenda for this meeting. Each person will be given up to five minutes to make his or her remarks.

VI. RESOLUTION

Board of Regents Consideration of human Embryonic Stem Cell Research

**IV. UNIVERSITY ADMINISTRATIVE AGENDA**

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University of Nebraska-Lincoln

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## Stem Cell Research Resolution

Co-Authored by:

Regent Howard Hawks, Regent Bob Phares, Regent Randy Ferlic, and Regent Tim Clare

WHEREAS, stem cell research – the effort to harness the power of the human body’s master builder cells for basic research, development of therapeutic drugs, and treatment of an expanding range of conditions in patients – is one of the most important and exciting fields in biomedical research; and

WHEREAS, patients’ medical conditions are being improved or outright cured with non-embryonic stem cells while clinical trials show promise of dramatic advances in this field; and

WHEREAS, stem cell research has the potential for important new discoveries in both therapeutic treatment and drug development to treat such common diseases and disorders as Parkinson’s disease, spinal cord injury, stroke, burns, heart disease, diabetes, osteoarthritis, and rheumatoid arthritis; and

WHEREAS, federally funded research from the National Institutes of Health (NIH) since 2001 has invested approximately \$3.7 billion on all types of stem cell research (source: <http://www.hhs.gov/asl/testify/2008/05/t20080508c.html> last accessed March 23, 2008); and

WHEREAS, the University of Nebraska Medical Center (UNMC) is nationally known for success with stem cell research, especially with the use of non-embryonic stem cells, which include stem cells harvested from bone marrow, blood, fat, nasal tissue, skin, the umbilical cord, and other places in the body; and

WHEREAS, in 2000, the President of the University of Nebraska established a committee to develop guidelines for human embryonic stem cell research conducted by University of Nebraska researchers, and the resulting recommendations adopted by the Board of Regents in 2001 require the University to follow federal guidelines, at the time effectively limiting human embryonic stem cell research to stem cell lines created on or before August 9, 2001; and

WHEREAS, Nebraska’s Stem Cell Research Act created the Stem Cell Research Advisory Committee, including the deans of both UNMC and Creighton University Medical Center and four other members from outside Nebraska who are conducting human stem cell research with funding from the NIH, in order to establish and administer a grant process to fund non-embryonic stem cell research projects conducted by Nebraska institutions or researchers; and

WHEREAS, the Stem Cell Research Advisory Committee, not later than 2011, is to report on the progress of the projects funded under the Stem Cell Research Act; and

WHEREAS, the Stem Cell Research Act did not alter the Board of Regents 2001 policy requiring University institutions or researchers to adhere to federal policy and use only federally approved stem cell lines; and

WHEREAS, the Stem Cell Research Act also provides that no University facilities or funds shall be used to destroy human embryos for the purpose of research, and similarly that no University facilities or funds shall be used to create a human embryo, including by somatic cell nuclear transfer; and

WHEREAS, science has recently discovered a breakthrough in stem cell research called direct reprogramming, which turns body cells into induced pluripotent stem cells (iPS cells) that function like embryonic stem cells and can be used in place of them; and

WHEREAS, international leaders in stem cell research have declared that producing iPS cells through direct reprogramming is superior to harvesting stem cells from human embryos because it is easier, it produces what scientists need for basic research, development of therapeutic drugs, and treatment of patients, and it poses no ethical problems; and

WHEREAS, federally funded research was further broadened with President Bush's June 2007 directive in Executive Order 13435, which expanded the NIH Embryonic Stem Cell registry to include all types of iPS cells, and renamed the registry as the Human Pluripotent Stem Cell Registry; and

WHEREAS, additional research is needed to realize the potential of stem cells and their uses as this field of research advances, especially including new methods of advancing iPS cells and more reliable methods to reprogram non-embryonic cells to a pluripotent state.

NOW, THEREFORE BE IT RESOLVED by the Board of Regents of the University of Nebraska, that no research with stem cells derived from human embryos may be conducted unless the stem cell lines used in the research were derived prior to 8 p.m. Central Standard Time on August 9, 2001, and are listed on the human embryonic stem cell registry established by the National Institutes of Health; and

BE IT FURTHER RESOLVED, that the Board fully supports and encourages stem cell research that utilizes stem cells from non-embryonic sources, including iPS cells; and

BE IT FURTHER RESOLVED, that all University of Nebraska policies, guidelines, rules, protocols, or other documents will be revised, as necessary, to comply with this directive.

11/12/09

**IV. UNIVERSITY ADMINISTRATIVE AGENDA**

**B. BUSINESS AFFAIRS**

University of Nebraska-Lincoln

1. Approve the Master Plan and Business Plan for Innovation Campus and authorize the President to submit the same as required by law and provide a commitment for the President to provide an annual update of the plans on behalf of the University to complete the University's obligations under Neb. Rev. Stat. § 2-113(2) (Supp. 2009) Addendum IV-B-1

TO: The Board of Regents Addendum IV-B-1

Business Affairs

MEETING DATE: November 20, 2009

SUBJECT: Approval of the Master Plan and Business Plan for the Innovation Campus.

RECOMMENDED ACTION: Approve the Master Plan and Business Plan for Innovation Campus and authorize the President to submit the same as required by law and provide a commitment for the President to provide an annual update of the plans on behalf of the University to complete the University's obligations under Neb. Rev. Stat. § 2-113(2) (Supp. 2009).

PREVIOUS ACTION: April 24, 2009 – The Board approved consulting contracts to develop a master plan and business plan for Innovation Campus in accordance with Neb. Rev. Stat. § 2-113(2)(b).

September 5, 2008 – The Board provided the first certification of \$7,500,000 by October 1, 2008 as required by Neb. Rev. Stat. § 2-113(2)(a).

January 23, 2009 – The Board provided the second certification of \$7,000,000 to equal fourteen million five hundred thousand dollars in cumulative increments by February 1, 2009 as required by Neb. Rev. Stat. § 2-113(2)(a).

April 24, 2008 – The Board provided the third certification of \$7,000,000 to equal twenty-one million five hundred thousand dollars in cumulative increments by July 1, 2009 as required by Neb. Rev. Stat. § 2-113(2)(a).

EXPLANATION: Neb. Rev. Stat. § 2-113(2)(b) requires the University of Nebraska to provide “. . . a master plan and business plan to carry out the master plan for the Innovation Campus to the Department of Administrative Services and to the Clerk of the Legislature on or before December 1, 2009, and a commitment to provide on or before December 1 of each year thereafter an annual update of the master plan and business plan to the Clerk of the Legislature.”

Following a formal qualifications-based Request for Proposal process, Board of Regents approved contracts with SmithGroup/JJR of Ann Arbor, Michigan and the Noddle Development Company, L.L.C., Omaha, Nebraska to complete a campus master plan and a business strategy plan respectively for Innovation Campus. The plans have been completed and will be submitted to the Clerk of the Legislature by December 1, 2009, as required by law. In addition, the President is hereby authorized and directed to submit an annual update to the same on or before December 1 of each year thereafter to the Clerk of the Legislature.

Members of the public and news media may obtain a copy of the plans in

the Office of the University Corporation Secretary, 3835 Holdrege Street, Lincoln, Nebraska 68583, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except University holidays.

PROJECT COST: None

SOURCE OF FUNDS: None

SPONSORS: Christine A. Jackson  
Vice Chancellor for Business & Finance

Harvey Perlman, Chancellor  
University of Nebraska-Lincoln

RECOMMENDED: James B. Milliken, President

DATE: October 30, 2009





## **NEBRASKA INNOVATION CAMPUS MASTER PLAN**

UNIVERSITY OF NEBRASKA-LINCOLN  
DECEMBER 1, 2009

## ACKNOWLEDGEMENTS

This plan was prepared simultaneously with a business development strategy, with the benefit of contributions from the Board of Regents, Governor Heineman, President Milliken, and countless members of the University of Nebraska and City of Lincoln community.

### Steering Committee:

John Bender, Academic Planning Committee, University of Nebraska-Lincoln  
Chris Beutler, Mayor, City of Lincoln  
Dana Bradford, President & Managing Partner, McCarthy Group  
Megan Collins, University of Nebraska-Lincoln Student Regent  
Barbara Couture, Senior Vice Chancellor, University of Nebraska-Lincoln  
Tom Henning, Chairman, President and Chief Executive Officer, Assurity Life Insurance Company  
Christine Jackson, Vice Chancellor for Business and Finance, University of Nebraska-Lincoln  
Bill Nunez, Director, Institutional Research and Planning, University of Nebraska-Lincoln  
Tonn Ostergard, President and Chief Executive Officer, Crete Carrier Corp.  
John Owens, Vice Chancellor, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln  
Prem Paul, Vice Chancellor for Research and Economic Development, University of Nebraska-Lincoln  
Joel Pedersen, University Counsel  
Harvey Perlman, Chancellor, University of Nebraska-Lincoln

### Master Plan Consultants:

SmithGroup/JJR  
Ehrhart Griffin and Associates  
Alvine Engineering  
RDG Planning & Design  
Eco-Centrics

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# 1 | MASTER PLAN OVERVIEW



## INTRODUCTION

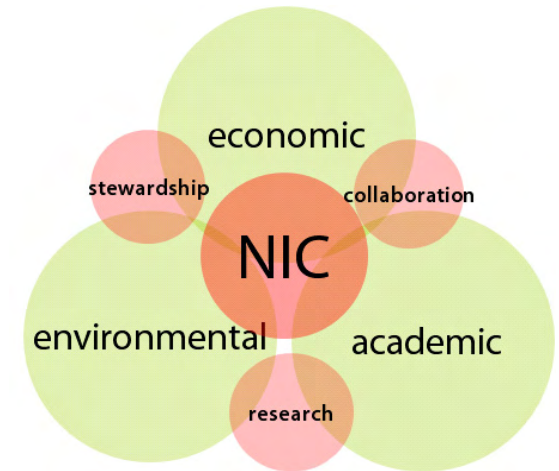
The University of Nebraska-Lincoln (UNL), in partnership with the President's Office, the university's Board of Regents, and a Steering Committee comprised of city, university, and business leaders, directed the development of this master plan and business development strategy for Nebraska Innovation Campus (NIC). Located on the former Nebraska State Fair site in Lincoln, Nebraska, NIC will be a new private-public partnership and research park dedicated to advancing research and its commercialization in order to generate economic growth for Nebraska. The university's goals for NIC are to create a master plan and business development strategy that is:

- Comprehensive.
- Based on existing research strengths, business conditions, and commercialization strategies.
- Driven by best practices for creating strong public/private partnerships, governance, and management.
- Creating key facilities that will have the greatest impact on research and commercialization.
- Competitive, innovative, flexible, and achievable.

## VISION

The business development strategy and master plan for NIC lay out a broad vision to attract innovative companies and research in pursuit of addressing state, national, and global concerns. NIC will provide an interdisciplinary research and mixed use environment that will support collaboration among private sector interests, university faculty and researchers, and government research within UNL's core competency programs, particularly in the areas of food, fuel, and water. The governance model of the campus will unite public and private sector interests, while its physical design promotes intellectual engagement, collaboration, and the transfer of scientific knowledge and research into usable products and processes in the marketplace.

The primary vision for NIC is to optimize the sustainability and long-term viability of three factors: economic, academic, and environmental. As a commercial entity, NIC must attract the private sector, build jobs, and be economically sustainable. As part of the University of Nebraska system, NIC must support the mission of the university to create knowledge and advance research. As a place, NIC must embody innovation and sustainability in its physical design.



NIC has the opportunity to be one of the most sustainable research parks in North America. The following set of sustainable master plan principles was established for NIC:

- 1. Adopt environmentally sensitive land use practices.**
  - Minimize impact to Salt Creek floodplain.
  - Capture and treat stormwater where it falls.
  - Create and restore plant and wildlife habitat.
- 2. Plan for innovative, sustainable buildings and landscapes.**
  - Recycle and reuse buildings, materials, and water.
  - Create energy-efficient buildings.
  - Create healthy and native landscapes that minimize maintenance and embody innovation.

**3. Ensure a range of transportation options.**

- Keep development compact.
- Make transit convenient.
- Make pedestrians and bicyclists a priority.

**4. Move toward a net zero energy and carbon neutral campus.**

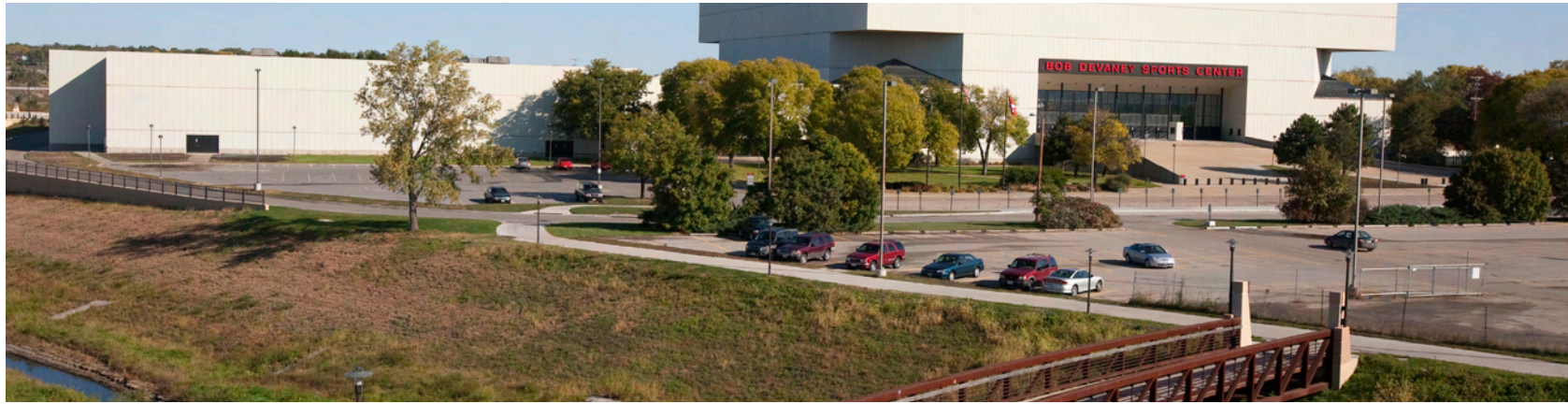
- Innovate with renewable energies on site.
- Capture energy from nearby wastewater effluent.
- Strive to reduce carbon emissions in energy production.

The physical program for NIC includes a mix of land uses for work, living, recreation, and amenities. The program is focused on job creation through university research and private/government research partners, based on successful models of national research parks. The plan is comprised of 1.8 million gross square feet (gsf) of development to be built out over the next 20 to 25 years.

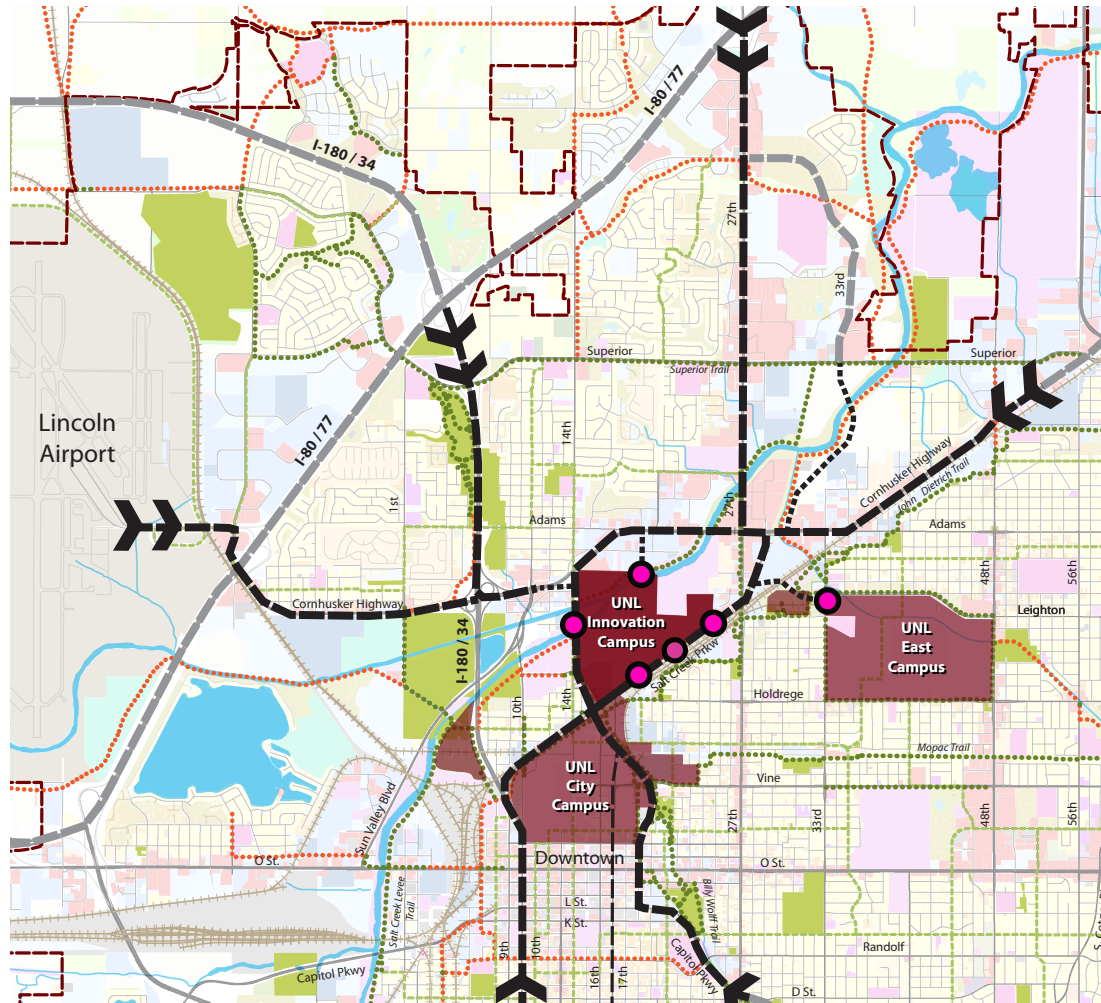
The master planning process was developed in conjunction with a business development strategy team led by the Noddle Companies.



## 2 | EXISTING CONDITIONS + ANALYSIS

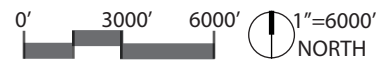


# SITE CONTEXT



## CONTEXT AND DIRECTIONS OF APPROACH

- Existing Major Directions of Approach
- Future Potential Directions of Approach
- Park and Open Space
- Existing Trails
- On-Street Bike Route
- Future Trails
- Existing and Potential Site Entrances



## BACKGROUND INFORMATION

The site for NIC is significant in the context of the city of Lincoln and state of Nebraska. Located on the former grounds of the Nebraska State Fair, the site is adjacent to both the UNL City and East Campuses. It is in the basin of the Salt, Oak, and Antelope Creeks that converge near the northwest corner of the site. The campus has a unique opportunity to build off of the access points that were designed to carry high volumes of traffic for the Nebraska State Fair and UNL athletic events. NIC has significant visibility from several existing adjacent roads in Lincoln, including Antelope Valley Parkway, Salt Creek Roadway, and 27<sup>th</sup> Street. Traffic volumes from the various directions of approach to the site are equally balanced from all directions. A major entrance to the site occurs at Military Road and Antelope Valley Parkway. Three future entrances, placed ¼ mile apart, are planned along Salt Creek Parkway. A potential entrance from 20<sup>th</sup> Street was also evaluated.

## BICYCLE/PEDESTRIAN NETWORK

There is an extensive pedestrian and bicycle trail network in the city of Lincoln that converges at the new Antelope Valley Project adjacent to NIC. Many of the existing and proposed trails are interconnected through roadway underpasses and bridges, and are supplemented by several



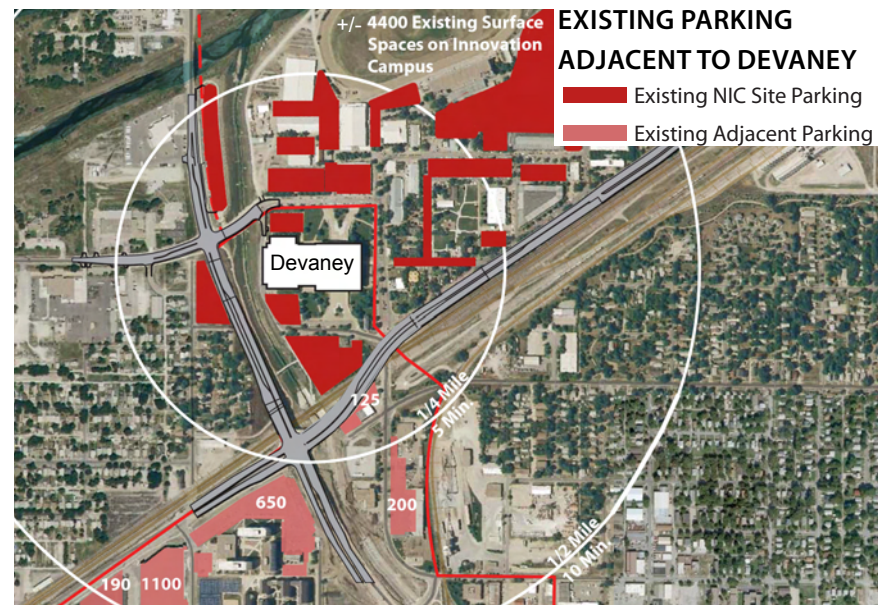
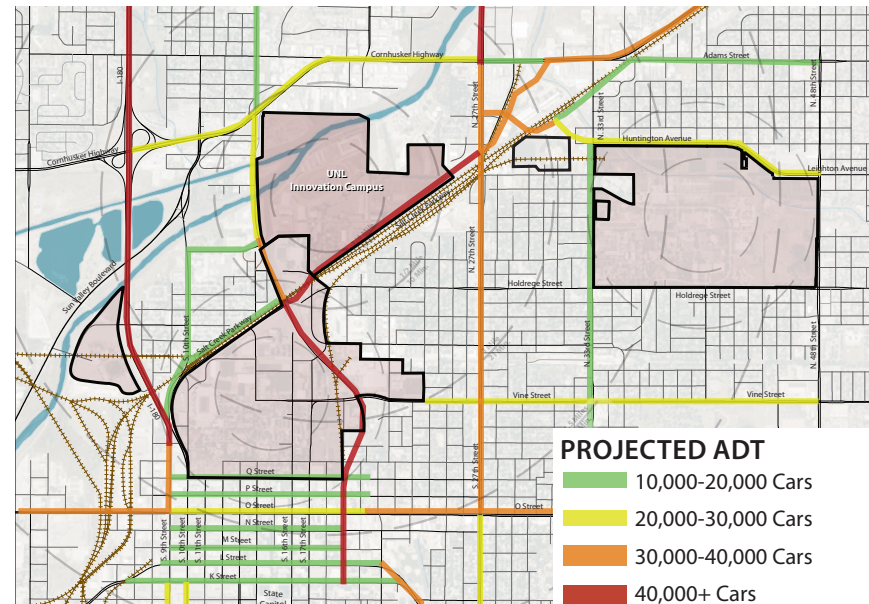
on-street bike lanes to form an alternate mode of transportation and connection to UNL's campuses.

### ROAD NETWORK PROJECTED ADT

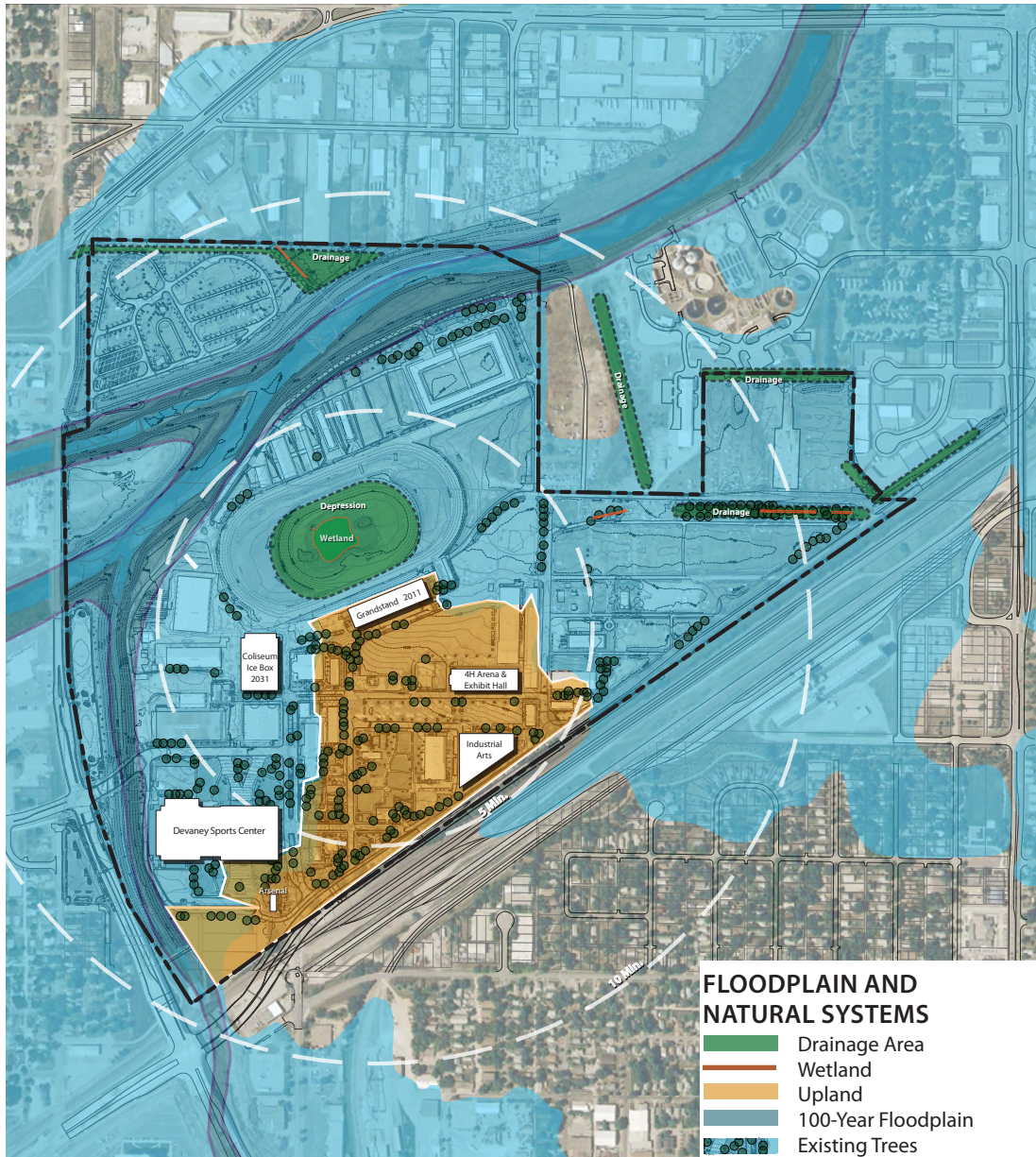
Antelope Valley Parkway and Salt Creek Roadway have two of the largest Average Daily Traffic (ADT) capacities in the city of Lincoln, providing adequate perimeter infrastructure for the build-out of NIC. However, long-term improvements need to be made to the intersection at Antelope Valley Parkway and Cornhusker Highway and the intersection at Salt Creek Roadway and 27<sup>th</sup> Street. Adjacencies to these major existing roadways highlight the importance to develop NIC as an important connection between City Campus and East Campus. These linkages also provide for connection to the Lincoln Central Business District, Interstate 80, and the Lincoln Airport, which carries over 100,000 passengers annually and is located directly west of the NIC site.

### PARKING

The NIC site currently accommodates 4,400 on-site parking spaces for UNL athletic events at the Devaney Sports Center. Additional parking spaces could be available within a 10-minute walk of NIC.



# NATURAL FEATURES ANALYSIS



## FLOODPLAIN

A challenge of the NIC planning process was the considerable amount of land within the Salt Creek floodplain. Of the 249-acre NIC site, only 48 acres are above the 100-year floodplain, including land currently occupied by the Grandstand, the 4-H Building, and the Industrial Arts Building. While the Antelope Valley Project regained a considerable amount of developable land from the floodplain south of NIC, the project does not ameliorate the impacts of the Salt Creek floodplain on the site.

A detailed *Wetland Delineation Report* was completed as part of the master planning process, locating open drainage areas in varying sites on NIC. Several of these drainage areas are identified as delineated wetland areas, including the drainage ditches on the east side and northern edge of the site, and on the infield of the existing horse track. The total acreage of all wetland areas on site is approximately 1 acre. Potential disruptions to these wetland areas can be mitigated on site.

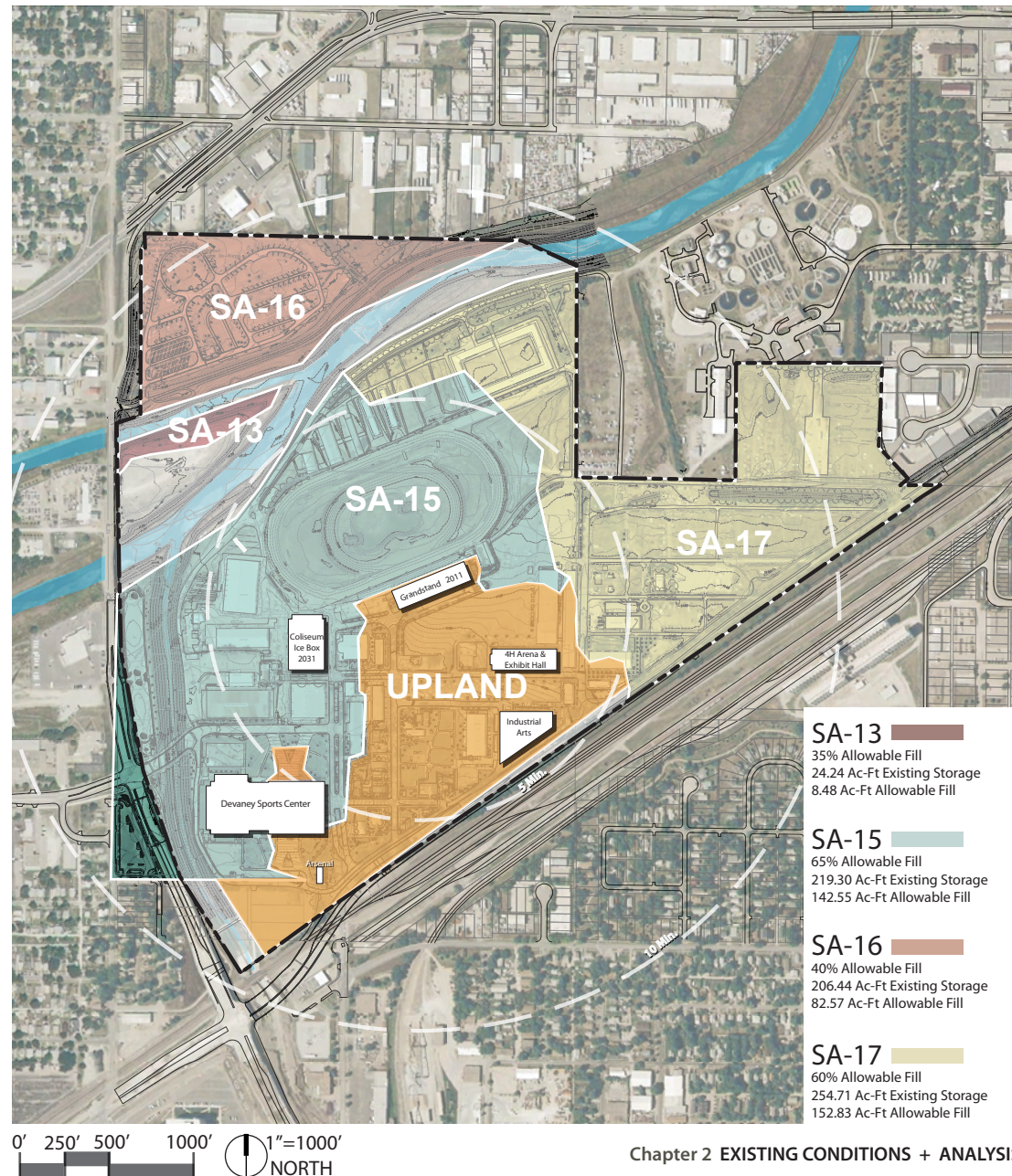
## ALLOWABLE FILL

### ALLOWABLE FILL

The NIC site is divided into four flood zones: SA-13, SA-15, SA-16, and SA-17. In working with the Lower Platte South Natural Resources District and the U.S. Army Corps of Engineers, the City of Lincoln conducted a study of the flood storage capacity for the Salt Creek floodplain and adopted a flood storage ordinance. The above mentioned regulations stipulate volumetric percentages for allowable fill and allowable flood storage capacities for all zones as shown in the chart to the right. Allowable flood storage capacity has been translated to cubic yards for zones SA-15 and SA-17 as shown in Table 2.1 below. As part of the master plan process, the planning team was asked by the city to consider the potential implications of a plan for NIC that has no net decrease of flood storage capacity for the site.

**TABLE 2.1 - ALLOWABLE FLOOD STORAGE CAPACITY**

Zone	% Allowable Fill	Ac-Ft	yd <sup>3</sup>
SA-15	65%	219.30	353,804
SA-17	60%	254.71	410,932



# EXISTING BUILDING INVENTORY + ANALYSIS



## EXISTING FACILITIES

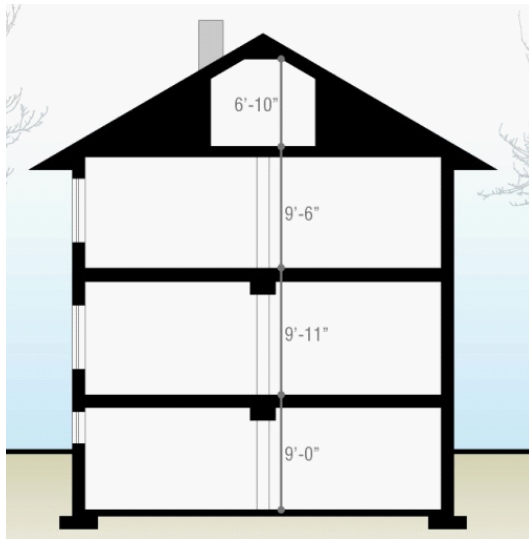
Several structures exist on the site, including athletic facilities at the Devaney Sports Center, the Ice Box, the Arsenal Building, the 4-H Building, and the Industrial Arts Building.

The Devaney Sports Center, currently used for athletics programs and events, is being master planned for expansion and additional parking capacity, and, as of the time of this report, will remain on campus in its current use. The Ice Box is used for hockey events and has a lease commitment through 2031; it is recommended that the structure be replaced in the future to allow for research or related mixed use development.

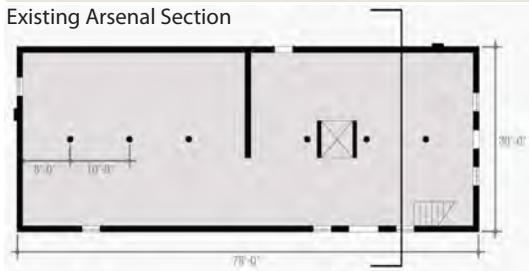
The map area highlighted in red depicts land owned by the Horseman's Association through 2011 per an agreement with the university.

Three buildings were reviewed for their existing condition, current code, and systems deficiencies, and evaluated for potential reuse for NIC campus programs. A detailed *Existing Building Evaluations Report* on these facilities was developed by SmithGroup/JJR and submitted to the university in June of 2009.





Existing Arsenal Section



Existing Arsenal Plan

## ARSENAL BUILDING

### CONDITION

The Arsenal Building, constructed in 1913, is a 4,800-gsf rectangular 2-story brick building that sits on the south border of the site and does not restrain the development necessary to make NIC successful. The building is listed on the National Register of Historic Places and is being used as a museum to display the history of the

Nebraska National Guard. In the short term, the building may be able to serve its current purpose. The building is generally in fair to poor condition but has limited reuse potential without substantial renovation. The exterior brick, windows, and doors are in poor condition, and the roof is beyond its expected life. The building is heated by a small forced-air ducted heating, ventilating, and air-conditioning (HVAC) system that lacks humidity control for artifacts. Mechanical, electrical, and plumbing (MEP) systems do not meet code. Toilets, stairs, and lack of an elevator do not meet Americans with Disabilities Act (ADA) requirements. There is no fire protection (FP) system.

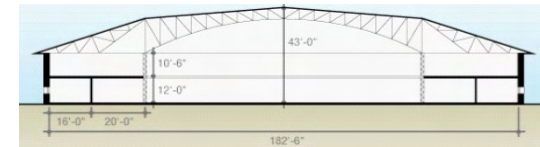
### ARSENAL POTENTIAL REUSE CONSIDERED

- Requires repair to building, MEP systems, and improvements of code deficiencies.
- Reuse potential is limited by column spacing.
- In the short term, the building should be retained as current museum use or converted to office use once the Nebraska National Guard can make other arrangements to display its collections.

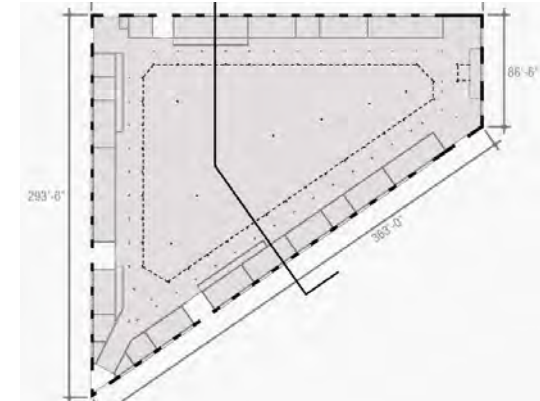
## INDUSTRIAL ARTS BUILDING

### CONDITION

The Industrial Arts Building, constructed in 1913, is a 2-story brick building of approximately 90,000 gsf with a mezzanine level and a high bay



Existing Industrial Arts Section



Existing Industrial Arts Plan

open space in the center. It is located adjacent to Salt Creek Roadway. The unique steel structure similar to a late 19<sup>th</sup> century European train station is its best asset; historical photos indicate a skylight that originally wrapped the roof perimeter at the mezzanine edge. Although the facility enjoyed a rich heritage of agricultural exhibits, the building has been condemned by local authorities due to poor condition, and no occupancy has been allowed in the recent past. There is no HVAC system, minimum electrical service, no elevator, and no central FP system. The MEP systems are inadequate for renovation and in need of complete replacement. The roof system has failed in some sections and needs

replacement. Exterior brick walls show various cracks; doors and exterior windows are in poor condition and need replacement. Mezzanine decks do not meet code. There is a program need for common scientific support space and future demonstration area requiring high bay space. A conceptual plan was developed for the Industrial Arts Building to evaluate its potential for this reuse, including a greenhouse/conservatory and additional incubator/accelerator lab suites. At 90,000 gsf, the existing building greatly exceeds the requirement for high bay demonstration space and conservatory or plant sciences greenhouse space. New floors and internal structural support would need to be added to the building for additional research space to make the program more feasible for materials science engineering programs. The initial cost estimate to renovate the Industrial Arts Building for this use is somewhat higher than new construction costs. In addition, the building's strategic site location would require an early renovation and reuse in the first phase of development to assure that it would not detract from development or be a security concern to the campus. Based on all of the above factors, and program priorities for biosciences to complement a new Agricultural Research Service facility, renovation and reuse of the Industrial Arts Building was not deemed very feasible.

#### INDUSTRIAL ARTS BUILDING POTENTIAL REUSE CONSIDERED

- Requires extensive exterior and façade repairs and restoration including doors, windows, roof deck, and roof.
- Requires new interior second floor, and accessible stairs, ramps, and toilets.
- Requires new efficient MEP/FP systems.
- Reuse potential considered for high bay demonstration space, conservatory, and greenhouse areas.

#### 4-H BUILDING

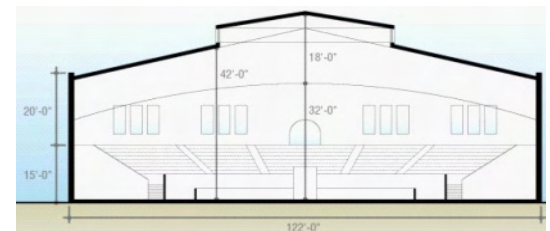
##### CONDITION

The 4-H Building, constructed in 1931, is a rectangular 2-story brick building with a sloped roof. It is roughly in the center of the NIC site. The facility is composed of two areas: a 2-story arena space to the east and two floors to the west totaling 68,000 gsf. The exterior brick masonry walls are in fair condition with need for minor repairs. Doors and windows are metal framed and need replacement to meet energy criteria. The tiered grandstand of the arena is constructed of cast-in-place concrete and engaged with exterior supporting columns; demolition of concrete grandstands would be relatively costly. Natural light is abundant due to exterior windows and roof monitor skylights. There are large circulation fans but no heating and cooling or FP systems. The electrical and lighting

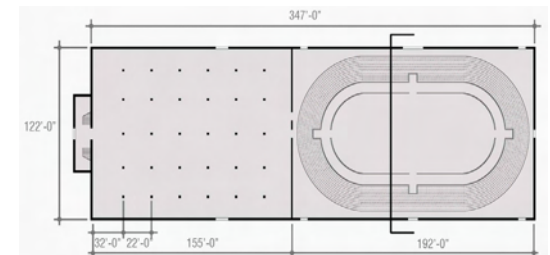
systems need to be upgraded. Toilets need to conform to new occupancy and accessibility requirements. This facility has a rich heritage for events and is still used to show exhibits with a special fire marshal waiver.

#### 4-H POTENTIAL REUSE CONSIDERED

- Historic details and original building features require restoration and repair.
- Deferred maintenance issues require attention.
- MEP systems require replacement.
- Potential reuse strategies include commons and conferencing uses due to its central location, additional conversion of the arena for use as seminar spaces, and single-story areas for exhibit, retail, suites, and offices.



Existing 4-H Section



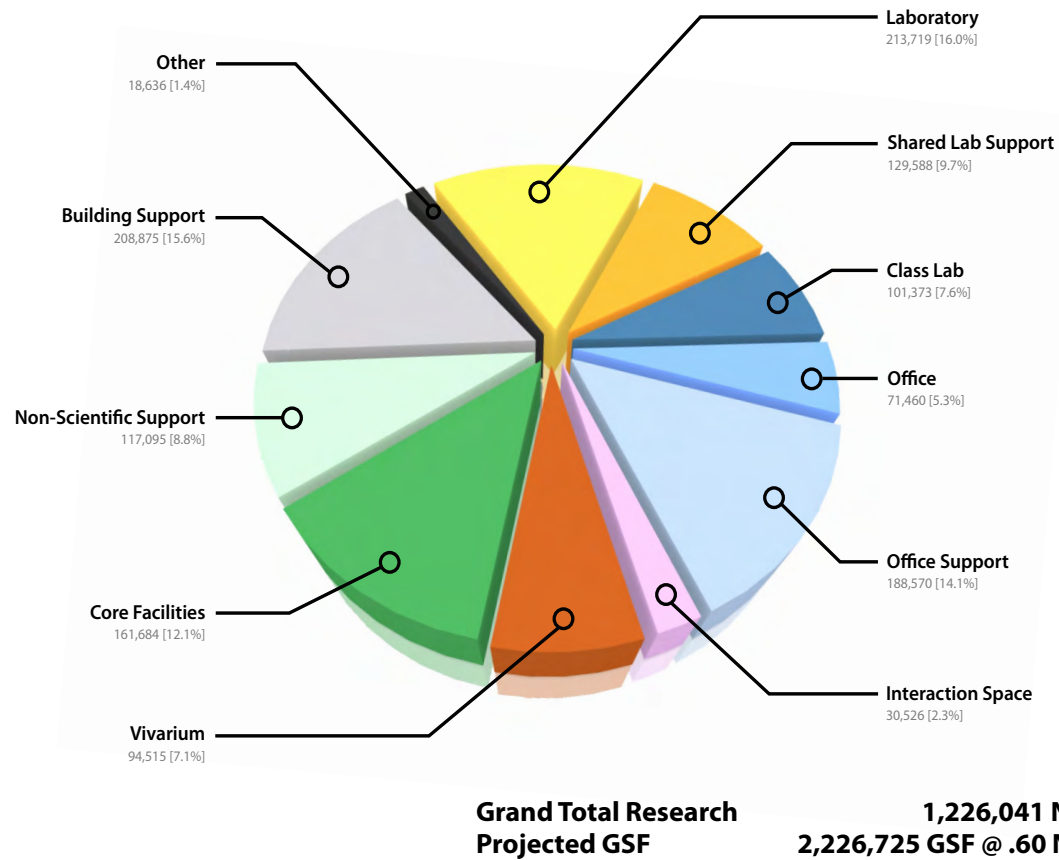
Existing 4-H Plan

# UNL CAMPUSES RESEARCH SPACE INVENTORY

## SPACE INVENTORY AND ASSESSMENT

The planning team evaluated the UNL space inventory database assignments for both the City Campus and East Campus research facilities. Overall, the total inventory of space assigned to research programs is 1,226,041 net square feet (nsf), which translates to a total of 2,226,725 gsf of equivalent facilities. The space assigned to research programs for office, laboratory, class labs, and support space totals 53 percent, and the remaining 47 percent is shared core facilities, and collaboration and building support space. It is important to note that spaces for seminar, conferencing, and interaction are a critical component of collaboration between faculty and students and a necessary part of science.

Most of the facilities are organized by departmental allocation. A representative set of UNL facilities were benchmarked for comparative allocation of space to research faculty principal investigators (PI) and overall



	UNL Beadle	UNL Morrison	UNL Brace Lab	UNL Ferguson	UNL Behlen	UNL Hamilton	UNL Manter	Group Weighted
Net SF/PI	2,144	2,388	4,407	1,428	1,638	3,969	2,791	2,735 NSF
Gross SF/PI	4,249	4,402	6,929	1,925	2,458	6,045	4,039	4,157 GSF
Net SF/FTE	309	176	249	475	249	407	461	350 NSF
Gross SF/FTE	611	324	373	640	373	620	667	533 GSF

faculty principal investigators (PI) and overall occupancy densities of full time equivalent (FTE) individuals.

Forum meetings were held with faculty groups including representatives from various programs and centers of excellence to evaluate existing space performance and potential program uses for NIC. Although the university has several core research strengths, it was deemed that programs seeking a more interdisciplinary research focus between departments were primary candidates for relocation to NIC.

The Beadle Center is an example of a successful interdisciplinary research building for shared programs in biochemistry, biotechnology, and plant sciences and was deemed an appropriate potential model for interdisciplinary research at NIC. This facility, at 161,260 gsf, could be further improved if planned for more open, flexible development with increased collaboration space and greater access to daylighting in the laboratories.

### PROGRAM VALIDATION

The planning team proceeded to work with the Steering Committee to validate a program model for NIC. Space allocation was benchmarked against comparative peer university research facilities for research space and the percentage of space devoted to specific uses. These space program models were then tested for a number of footprints for bench top lab, office, lab support, high bay lab, and core support space configurations.

As part of the development of the Framework Plan, these space comparisons were translated into a set of planning guidelines for academic research facilities.

### NIC Academic Research Guidelines

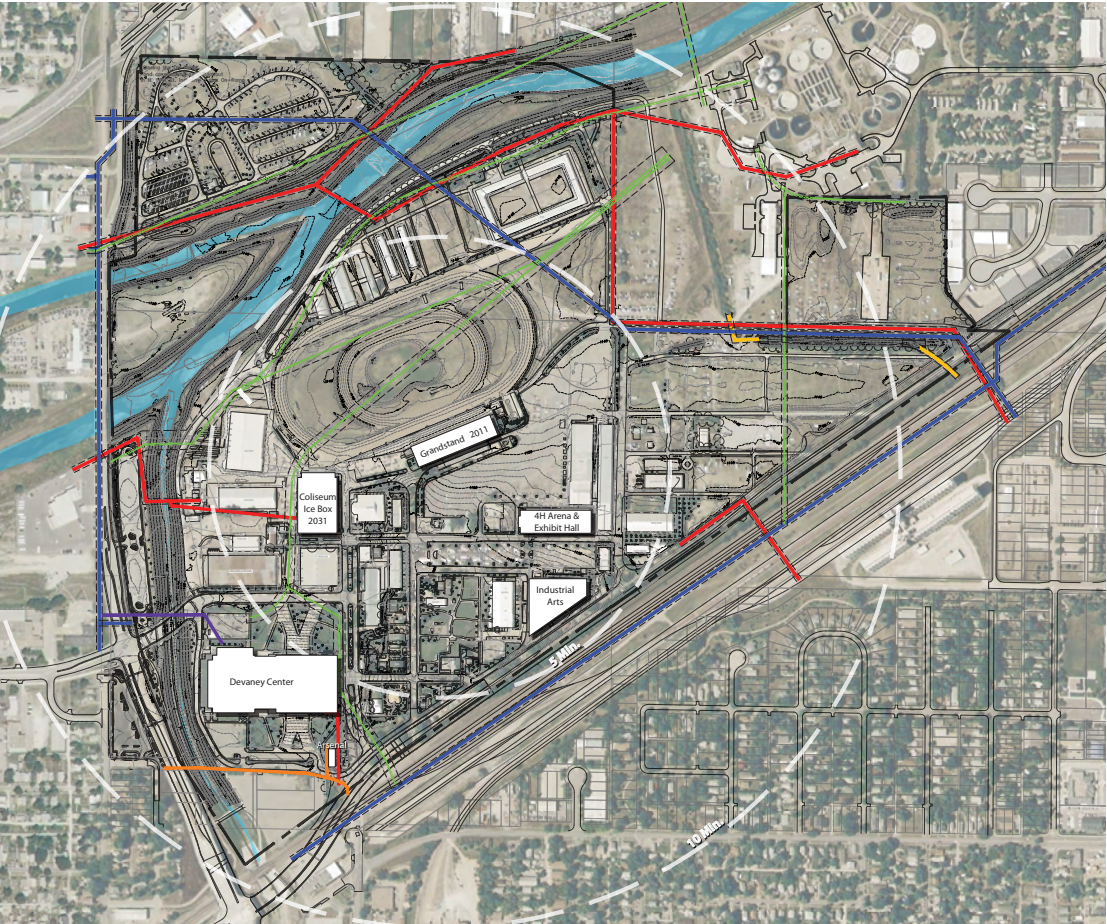
- 2700 NSF/PI**
- 4400 GSF/PI**
- .60 N/G Building Efficiency**
- 550 GSF/FTE**

	Biosciences Labs	Engineering Labs
Laboratory	25% to 30%	35% to 45%
Lab Support	25% to 30%	15% to 20%
Research Office	15% to 20%	20% to 25%
Total Dedicated	65% to 80%	70% to 90%
Interaction	4% to 6%	5% to 10%
Vivarium	4% to 6%	
Core Facilities	7% to 10%	0% to 7%
Non-Scientific Support	2% to 8%	2% to 8%
Building Support	2% to 3%	2% to 3%
Other	1% to 2%	1% to 2%
Total Shared	20% to 35%	10% to 30%

	UNL Wt. AVG	UCSF Genentech	U Michigan Life Sciences	LSU Cancer Center	Louisville Biosciences	Texas Tech Biomedical	U Arizona T-Gen	U Illinois Life Sciences	Mich State Biophysical
Net SF/PI	2,735	4,031	3,996	1,734	1,663	3,000	4,763	2,362	1,849
Gross SF/PI	4,157	7,244	6,589	2,873	2,828	5,023	7,681	4,552	3,710
Net SF/FTE	350	225	428	192	240	289	256	197	783
Gross SF/FTE	533	405	655	307	407	484	541	379	379



# INFRASTRUCTURE-UTILITIES



**LEGEND**

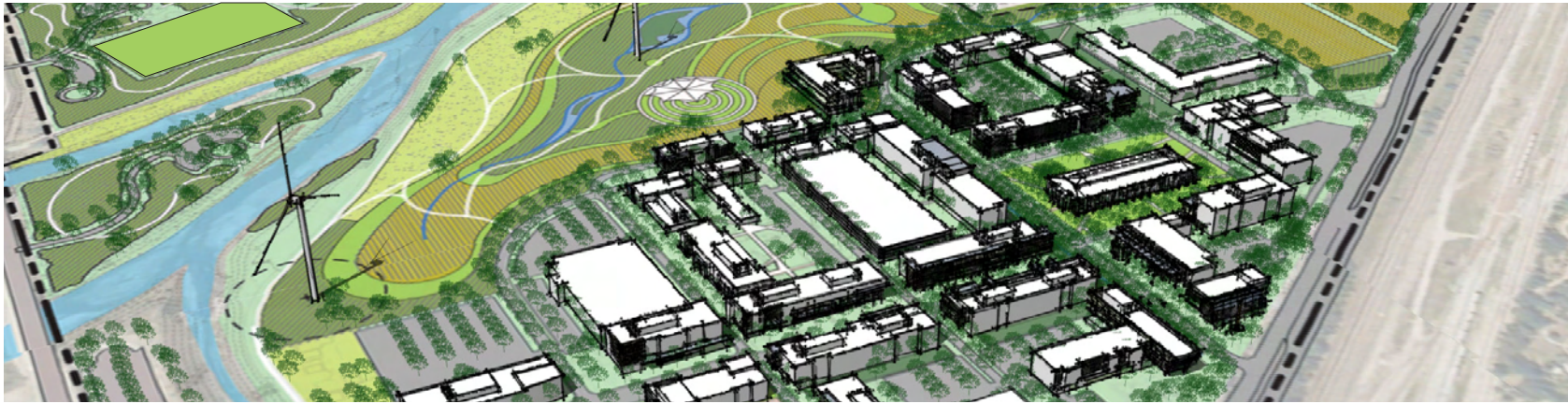
- Storm Sewer
- Sanitary Sewer
- Water Main
- Steam
- Electrical Duct Bank



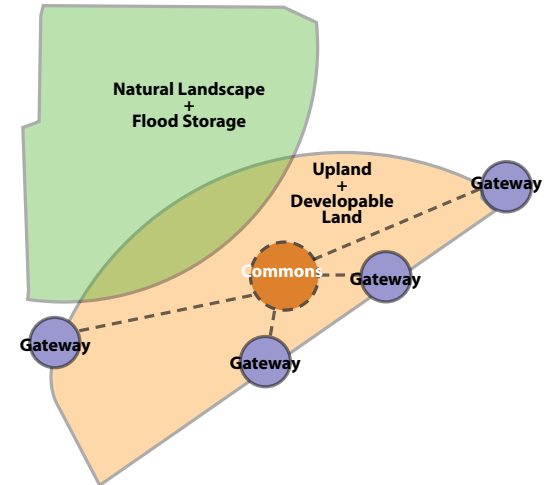
Existing on-site utilities, including storm and sanitary sewer, water, electrical, communications, and gas, were located and analyzed for this site. Public utility service location, size, capacity, and easement requirements were determined.

Due to the central location within Lincoln and the proximity to the wastewater treatment facility, several public utility mains are located through this site. These include several large diameter sanitary sewer lines, a water line, and overhead electric distribution lines. These existing utilities will pose design constraints to the site as development occurs.

# 3 | THE MASTER PLAN



# ORGANIZATIONAL CONCEPT AND FRAMEWORK PLAN



## ORGANIZATIONAL CONCEPT

The concept for the NIC plan builds upon the existing conditions analysis of the site by creating a development hub that centers on the 4-H Building and existing upland as a central commons with access from four major site gateways. In keeping with the Lower Platte South Natural Resources District and U.S. Army Corps of Engineers guidelines, the remainder of the site adjacent to Salt Creek will be used as a regional and state-of-the-art naturalized open space that increases the net flood storage capacity of the entire site.

## FRAMEWORK PLAN

The NIC Framework Plan is intended as a flexible tool that will guide future

development. It depicts the placement of human-built elements such as building locations, roads, parking areas, and open space, and the relationships between these elements on the land. The Framework Plan establishes key planning concepts such as campus organization, general building massing, primary frontage streets, and scale of development. It does not represent specific building footprints or final architectural or landscape design. As such, it can be adaptable to the specific needs of individual tenants and users as the campus builds out. The fundamental function of the Framework Plan is to represent the planning principles in a flexible plan to guide and manage development of the campus, as political, economic, administrative, and program variables may change.

### PROGRAM MODEL

A program model was developed for NIC to include public and private research uses; research support functions; and residential, recreation, and campus amenities based on emerging trends in other successful research parks. The primary program includes interdisciplinary research, office space for the university and the private sector, and shared uses such as conferencing and amenities that foster a collaborative environment for

**TABLE 3.1 - PROGRAM TEST MODEL (Full Build-Out)**

	GSF	FTE
University Research	400,000	570
<i>*Interdisciplinary Research 1</i>		
<i>Interdisciplinary Research 2</i>		
<i>Interdisciplinary Research 3</i>		
<i>Interdisciplinary Research 4</i>		
<i>-with Commercialization</i>		
Private/Government Partners	727,000	1,645
<i>*USDA/ARS</i>		
<i>Private Multi-Tenant Lab 1</i>		
<i>Private Company Lab 1</i>		
<i>Private Multi-Tenant Lab 2</i>		
<i>Private Company Lab 2</i>		
Commons	275,500	400
<i>*4-H Reuse, Cafe, Conferencing,</i>		
<i>Plus Accelerator-Incubator</i>		
<i>*Hospitality</i>		
<i>Retail/Service</i>		
Core Support	135,000	220
<i>*Demonstration Center</i>		
<i>Incubator</i>		
<i>*Core Lab/Analytical Equipment</i>		
Residential	262,500	
<i>Multi-Family Workforce/Grad</i>		
<i>(250 Units)</i>		
Total Development	1,800,000	2,835
<i>*Denotes Phase 1 Program</i>		

science and business development. The model anticipates approximately 1.8 million square feet of development and facilities averaging 3 stories for university and private/government sector development, organized around a common core of support facilities.

Research themes that are most likely to be developed include the following:

- Agriculture Biotechnology, Life Sciences, Food and Nutrition
- Computer Sciences and Bioinformatics
- Materials Sciences and Nanotechnology
- Water Resources
- Clean Energy Technology
- Transportation

Research programs will be interspersed with residential, hospitality, and mixed use opportunities, creating a 24-7 environment.



Bioscience Open Lab



Materials Science High Bay

# ILLUSTRATIVE PLAN AND DEVELOPABLE FOOTPRINTS



**TABLE 3.2 - DEVELOPMENT POTENTIAL**

	Ground Floor SF	Total FL	GSF
<b>Research</b>			
R1	46,600	1.5	70,000
R2	36,500	3	109,500
R3	20,000	4	80,000
R4	23,500	3	70,500
R5	11,000	3	33,000
R6	30,000	3	90,000
R7	30,000	3	90,000
R8	23,500	3	70,500
R9	30,000	3	90,000
R10	30,000	3	90,000
R11	30,000	3	90,000
R12A	30,000	3	90,000
R12B	25,000	1	25,000
R13	30,000	3	90,000
R14	30,000	3	90,000
R15	30,000	3	90,000
R16	20,000	1.5	30,000
R17	16,500	1.5	24,750
R18	10,000	2	20,000
R19	12,500	2	25,000
R20	20,000	4	80,000
R21	33,000	3	100,000
Sub-Total			1,545,250
<b>Mixed Use</b>			
M1	12,500	2	25,000
M2	12,500	2	25,000
M3	17,500	4	80,000
M4	20,000	3	60,000
M5	20,000	3	60,000
M6	25,000	1	25,000
Sub-Total			275,000
<b>Hospitality</b>			
H1	20,000	4	80,000
<b>Commons</b>			
C1 (4-H)			68,000
C2	10,000	1	10,000
Sub-Total			78,000
Total Development Shown			1,978,250



NIC Illustrative Aerial Perspective



NIC Golf Course Alternative



Native Plantings, University Research Park, Madison, WI

## ILLUSTRATIVE PLAN

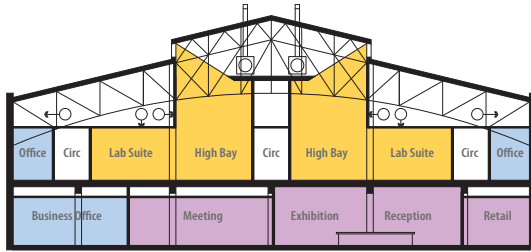
The Illustrative Plan on the facing page represents an ideal campus configuration at full build-out in the long term. Foundationally, this tool is intended to communicate design principles and illustrate the character of development intended by the design guidelines. It is important to note that the Illustrative Plan and accompanying perspectives are not intended to be interpreted verbatim, but to suggest the scale, design vocabulary, and landscape pattern proposed for NIC. The Illustrative Plan represents the function of terrain and natural character, and development of human-scaled environments. The deliberate open spaces and fabric of the plan are pertinent reminders of the campus as a place of learning and intellectual exchange. Taken collectively, the Framework Plan, Illustrative Plan, and design guidelines are intended to aid in short-, mid-, and long-term decision-making.

A naturalized and research environment within the floodplain of Salt Creek will complement the more urban environment of NIC. This functional landscape will serve as a regional park for the university and city of Lincoln, and will be utilized for energy production, stormwater management, outdoor research, and recreation. Trails, overlooks, and learning spaces are envisioned for this area, providing a place for researchers to recreate and community members to gather. Specific alternative

programmatic concepts for the open space also include a potential outdoor amphitheater, and a relocated throws area for the Nebraska Track and Field team. Alternatively, a 3-hole golf course could be considered as an opportunity to serve employees of NIC and community members, while also providing research and job opportunities for the university's turf research and golf management programs, demonstrating sustainable design and management techniques.

The specific building zones within the urban environment are coded by primary use in Table 3.2 and laid out using typical dimensions for each use type. The structure of the plan builds upon an urban environment grid of typical 400' x 400' blocks that allow for the largest flexibility for future development by university research or single and multiple private development partners.

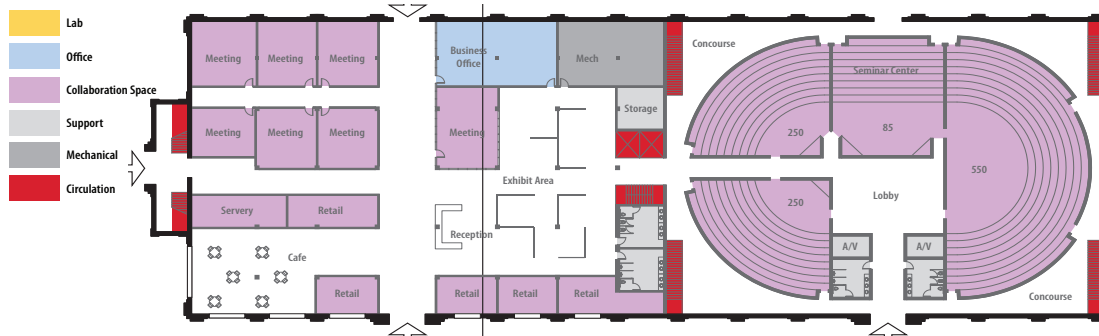
Research building zones are shown at 100 feet wide, which could be wider or narrower depending on the specific lab configuration. Table 3.2 identifies each building zone, defines the base footprint in gsf for each, and provides an idea for the number of floors and subsequent total gsf. This table is provided as a guide for potential development and intended density and building height. The actual gsf per building will vary depending on the number of floors, configuration of the base floor, existence of a lower level, and whether penthouse space is provided or not.



4-H Innovation Commons Proposed Section

Due to a program-identified need for common shared space to augment collaboration and interaction, it is recommended that the 4-H Building be restored to create a 4-H Innovation Commons that provides seminar, conference, exhibit, retail, and start-up program space, and acts as the campus nucleus for activity and shared

amenities. The first floor arena area can be subdivided to accommodate several large seminar rooms from 85 to 550 seats; the first floor of the west wing can house conference rooms, retail shops, a café, business office, and exhibit space. The second floor can be developed as a research incubator with lab/office suites.



4-H Innovation Commons Proposed Plan

### PHASING

Phasing is an extremely important consideration in developing a master plan for a private-public research park. According to the Association of University Research Parks (AURP), research parks can take 25 or more years to reach full build-out. Development of a credible and marketable Phase 1 is necessary to establish an early critical mass and attract further investment. Establishing the first research cluster concentrated around the 4-H Innovation Commons will enhance the collaboration between the university, government research, and potential private partners.



Exterior View of the 4-H Innovation Commons

The university is currently in negotiations with the USDA to develop an Agricultural Research Service (ARS) facility of approximately 70,000 gsf. It is important that this first building is sited directly adjacent to a redeveloped 4-H Innovation Commons to create an initial synergy and sense of place at the core of

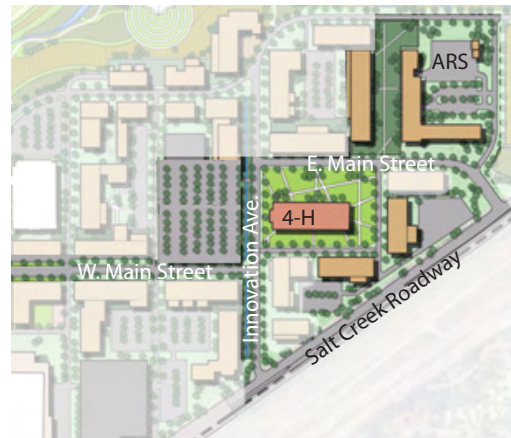
NIC. The proposed location for the ARS facility is positioned so that site work and preliminary construction can occur while still accommodating the Horseman's lease agreement to occupy the racetrack and barns until the year 2011.

Additional Phase 1 buildings include a proposed UNL research facility that will partner with the USDA in agricultural research, renovation of the 4-H Building, a second research facility that may accommodate high bay lab/demonstration uses, and a hospitality site for approximately 135 beds adjacent to the conference facility at the 4-H Innovation Commons. Three new entrance roads, streetscape improvements, surface parking lots, and associated landscape improvements bring the total acreage of Phase 1 to 37.5 acres.

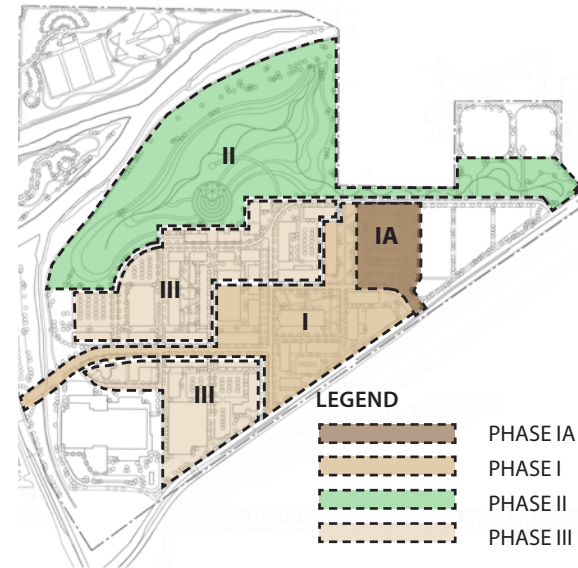
### CUT/FILL BALANCE

Building a dense NIC on the existing upland and utilizing the area adjacent to Salt Creek for flood storage have allowed the planning team to minimize fill areas within the 100-year floodplain and balance cut and fill on site. The NIC conceptual grading plan accommodates the full build-out of the program and results in an increase in the combined flood storage capacity of SA-15 and SA-17 as a contiguous land area on the site south of Salt Creek.

## PHASING



Phase 1 Illustrative Plan



## CUT/FILL BALANCE




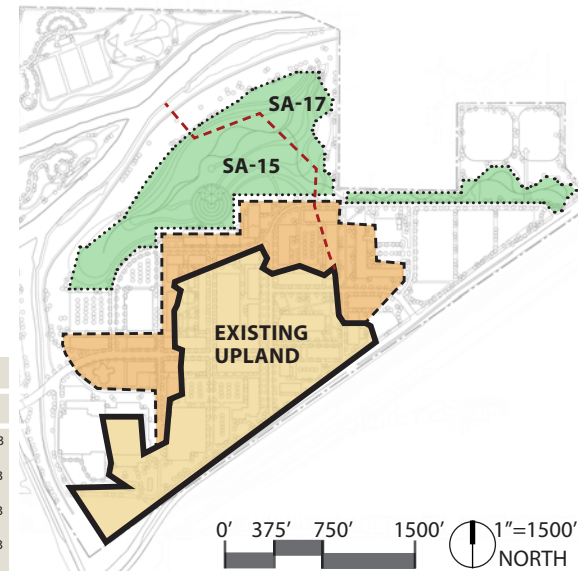
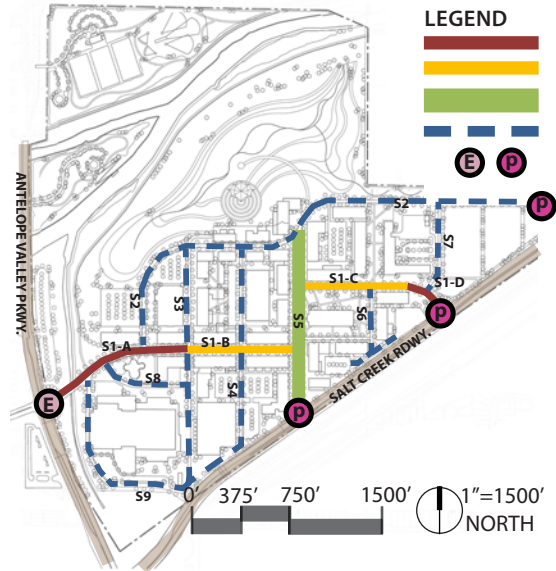
ENTIRE SITE CUT AND FILL		
	Existing Upland	48 Acres
	Cut	585,086 yd <sup>3</sup>
	Net Cut (-35% Poor Soil)	<b>380,306 yd<sup>3</sup></b>
	Fill	260,922 yd <sup>3</sup>
	Net Fill = 1.4 x Fill (compaction)	<b>365,291 yd<sup>3</sup></b>

TABLE 3.3 - PROPOSED FLOOD STORAGE			
	SA-15	SA-17	Combined
Min. Required	123,832 yd <sup>3</sup>	164,373 yd <sup>3</sup>	288,205 yd <sup>3</sup>
Existing	353,804 yd <sup>3</sup>	410,932 yd <sup>3</sup>	764,736 yd <sup>3</sup>
Proposed	217,877 yd <sup>3</sup>	557,319 yd <sup>3</sup>	775,196 yd <sup>3</sup>
Net Change	(135,927 yd <sup>3</sup> )	146,387 yd <sup>3</sup>	10,460 yd <sup>3</sup>





# PROPOSED CIRCULATION



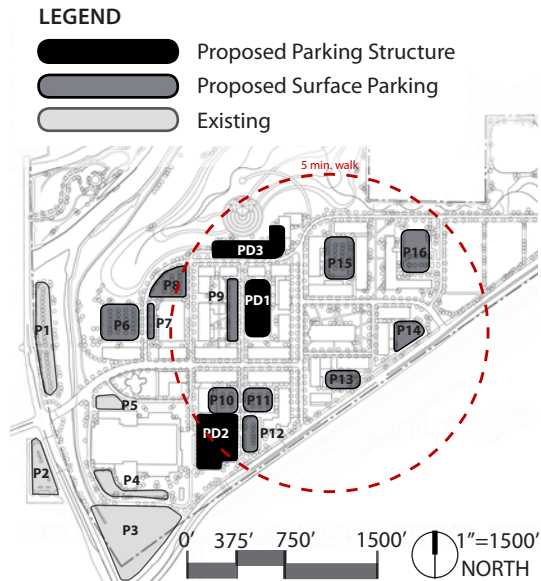
Name	Right-of-Way	# of Lanes	
S1-A, S1-D	Entry	90'	4
S1-B, S1-C	Main St.	90'	3
S5	Innovation Ave.	120'	3
S2-S8	Secondary St.	67'	2

Existing and Proposed Signalized Entries

## PROPOSED CIRCULATION

Four gateways are envisioned for NIC. An existing 4-lane entry at Military Avenue and Antelope Valley Parkway will remain in place but will be realigned in front of the Devaney Sports Center to bring the NIC Main Street on axis with the 4-H Innovation Commons. Three new full entries are proposed along Salt Creek Roadway, spaced ¼ mile apart, in accordance with City of Lincoln traffic engineering design guidelines. Entry S1-D, forming the east entrance to Main Street, is designed as a 4-lane entry, providing a key image entry for Phase 1 development. The entry at S5 will showcase the stormwater management techniques on campus through an offset median that highlights naturalized landscape features to the streetscape. All other roadways on campus are designed as 2-lane roads, with occasional opportunities for on-street parking. Traffic signals will be required at all entries, but the remainder of roads within NIC will be regulated by stop signs.

# PROPOSED PARKING



## PROPOSED PARKING

Seven hundred and fifty dedicated parking spaces are needed on campus for the USDA,

proposed hospitality, and future mixed use buildings. Assuming a parking requirement of 80 percent of the number of FTE employees on campus, 2,640-2,755 shared parking spaces will be needed to serve the build-out illustrated in the master plan. There are 5,150 parking spaces planned for NIC, which includes 4,400 shared spaces for athletic events. This parking strategy is accomplished through the development of two parking decks and dispersed on-street and surface lots. As a sustainability-driven and innovative campus, parking should only be built

Name	Type	# of Floors	# of Spaces
P1	Ex. Surface	1	280
P2	Ex. Surface	1	150
P3	Ex. Surface	1	375
P4	Ex. Surface	1	120
P5	Ex. Surface	1	80
P6	Prop. Surface	1	260
P7	Prop. Surface	1	50
P8	Prop. Surface	1	150
P9	Prop. Surface	1	90
P10	Prop. Surface	1	105
P11	Prop. Surface	1	130
P12	Prop. Surface	1	105
P13	Prop. Surface	1	85
P14	Prop. Surface	1	125
P15	Prop. Surface	1	130
P16	Prop. Surface	1	150
P17	On-Street	1	140
PD1	Proposed Deck	4	800
PD2	Proposed Deck	5	1,625
PD3	Proposed Deck	1	200
Total			5,150

if needed, and strategies to reduce the parking footprint on campus, including bike, transit, and car pooling, are recommended as high priorities.

### PROPOSED TRANSIT

The university presently runs a transit loop, operated by Star-Tran, that connects City Campus and East Campus. However, this loop operates on a limited schedule with a 30-minute headway and is underutilized. In order to connect NIC to the City and East Campuses, it is recommended that the university develop a new transit route that will link all three campuses, utilizing Antelope Valley Parkway to access City Campus and the 27<sup>th</sup> Street bridge overpass to access East Campus. The new route will traverse East and West Main Streets within NIC, with three stops spaced at a 2- to 3-minute walk apart. It is recommended that the university and ICDC work with the City of Lincoln to extend city bus routes into NIC to reduce the use of single-occupant vehicles arriving on campus.

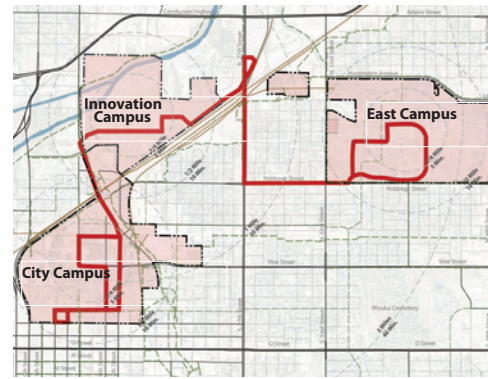
### BICYCLE AND PEDESTRIAN CIRCULATION

The transit system on NIC will be integrated with an interconnected bicycle and pedestrian circulation system that includes sidewalks, on-street bike lanes, off-street trails, and shared streets to provide alternate means for circulation.



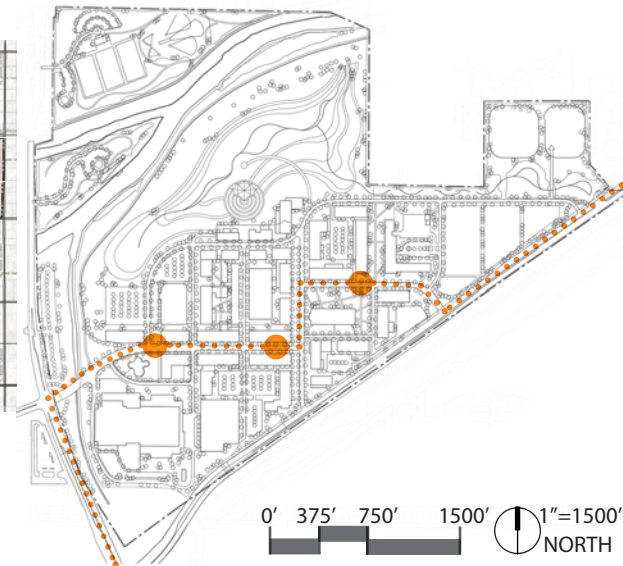
## PROPOSED TRANSIT

### REGIONAL TRANSIT DIAGRAM



### SITE TRANSIT

- ● ● Proposed Transit Route
- Proposed Transit Stop



## BICYCLE AND PEDESTRIAN CIRCULATION

### BICYCLE AND PEDESTRIAN CIRCULATION

- On-Street Bike Lane
- - - Off-Street Multi-Purpose Trail
- ● ● Shared Streets
- Pedestrian Routes



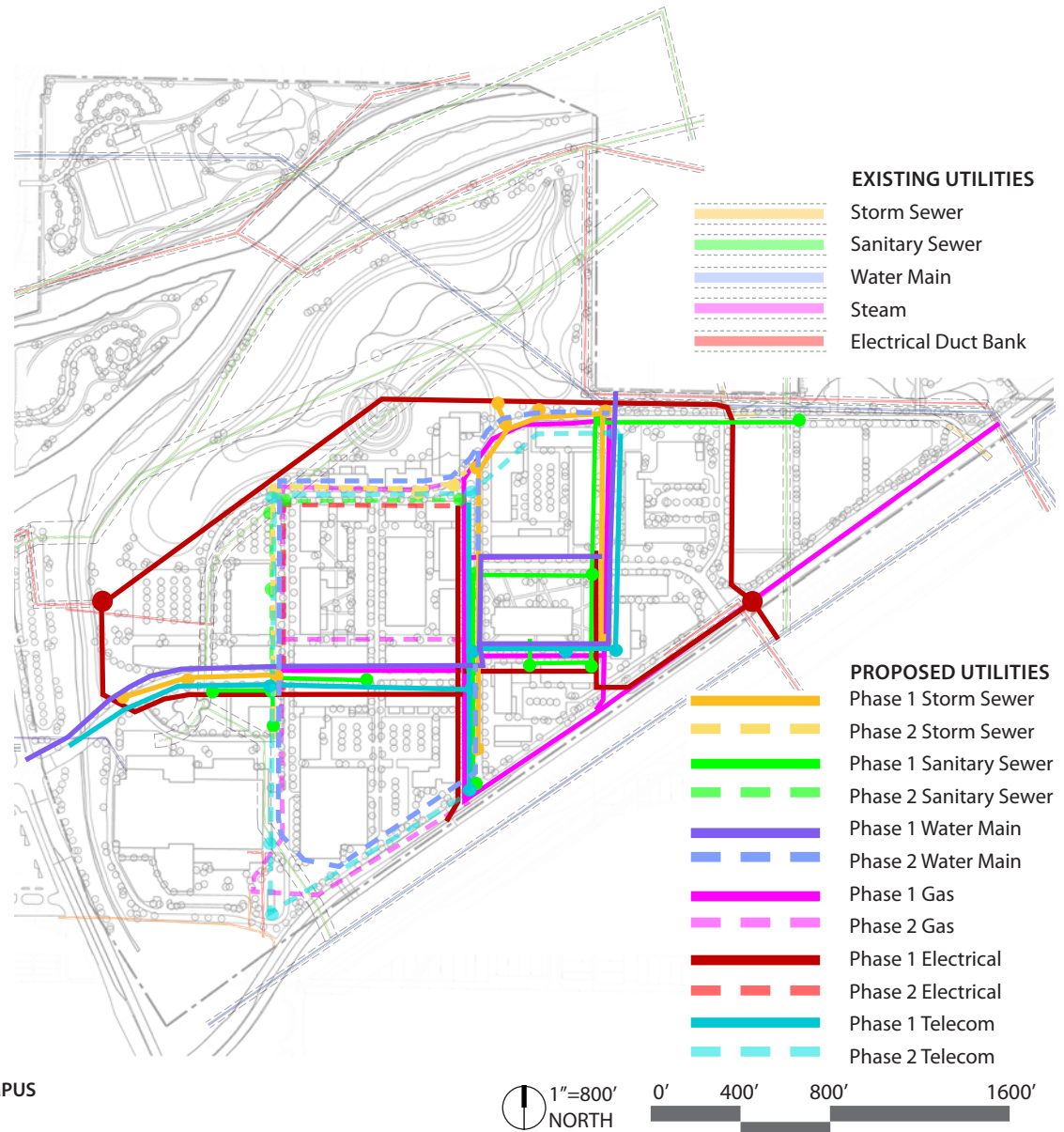
# INFRASTRUCTURE

Proposed infrastructure routes were developed through interaction with local utility companies, extensive research of local design criteria, and solutions providing maximum benefit to the campus. The development of the infrastructure is detailed further within the Infrastructure Guidelines of this report. The diagram at the right indicates recommended routing for each individual utility, broken into two phases. Verification of the routing will need to occur with local utility companies during final design documents for the site.

A key design consideration that influenced the routing was to verify that each site, and the campus as a whole, has access to redundant utility connections for electricity, water, gas, and telecommunications.

### FUTURE UTILITY MODIFICATIONS

1. Redesign and relocate new utilities underground.
2. Recommend working with the City of Lincoln to utilize public utilities on site.
3. Utilities must be phased appropriately to not disrupt existing buildings on site, such as the Ice Box.
4. A new fiber-based communication system will be provided throughout campus.



## SITE DESIGN GUIDELINES

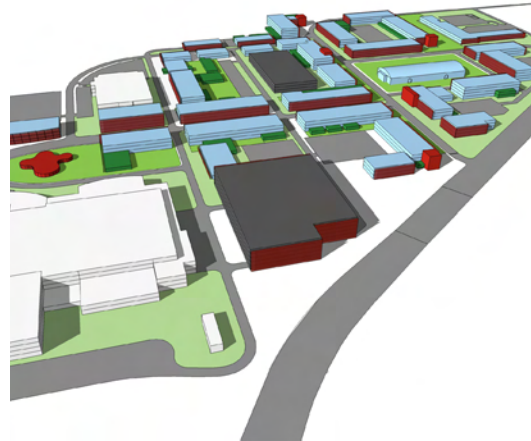


In addition to this master plan, the consultants agreed to provide the university a set of guidelines and analyses for implementing the master plan. These documents will be provided to the university pursuant to its RFP.

Site Design Guidelines include the following topics:

- Setback/Build-To Lines
- Land Use Opportunities
- Landscape Character
- Streetscape Character
- Gateways
- Site Lighting
- Sustainable Landscape
- Stormwater

## ARCHITECTURE DESIGN GUIDELINES



Architecture Design Guidelines include the following topics:

- Building Massing, Scale, and Proportion
- Building Heights
- Roofscapes
- Architectural Style, Materials
- Facility Planning
- Sustainable Buildings

## INFRASTRUCTURE GUIDELINES



Infrastructure Guidelines will address specific site requirements in coordination with established design standards. These guidelines will highlight opportunities and constraints inherent to the site characteristics. Infrastructure Guidelines include the following topics:

- Sanitary Sewer
- Storm
- Domestic Water
- Gas Utility
- Electric Utility
- Telecom/Fiber Optics
- Alternative Energy

# VIEWS



Bird's Eye View Looking North Along Innovation Avenue



Street Level View Looking North Along Innovation Avenue

# VIEWS



Bird's Eye View Looking Northeast Toward the 4-H Innovation Commons at the Corner of Innovation Avenue and Main Street



Street Level View Looking East Along Main Street



# NEBRASKA INNOVATION CAMPUS BUSINESS DEVELOPMENT STRATEGY

UNIVERSITY OF NEBRASKA-LINCOLN

Noddle Development Company | GBBN Architects, Inc.

NOVEMBER 2009

## ACKNOWLEDGEMENTS

This plan was prepared in collaboration with a property Master Plan, and with the benefit of contributions from the Board of Regents, Governor Heineman, President Milliken, and countless members of the University of Nebraska and City of Lincoln community.

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**Research Park Consultants<sup>2</sup>**

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**Kiewit Construction Company**

Lincoln, NE



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## A. INTRODUCTION

### Vision

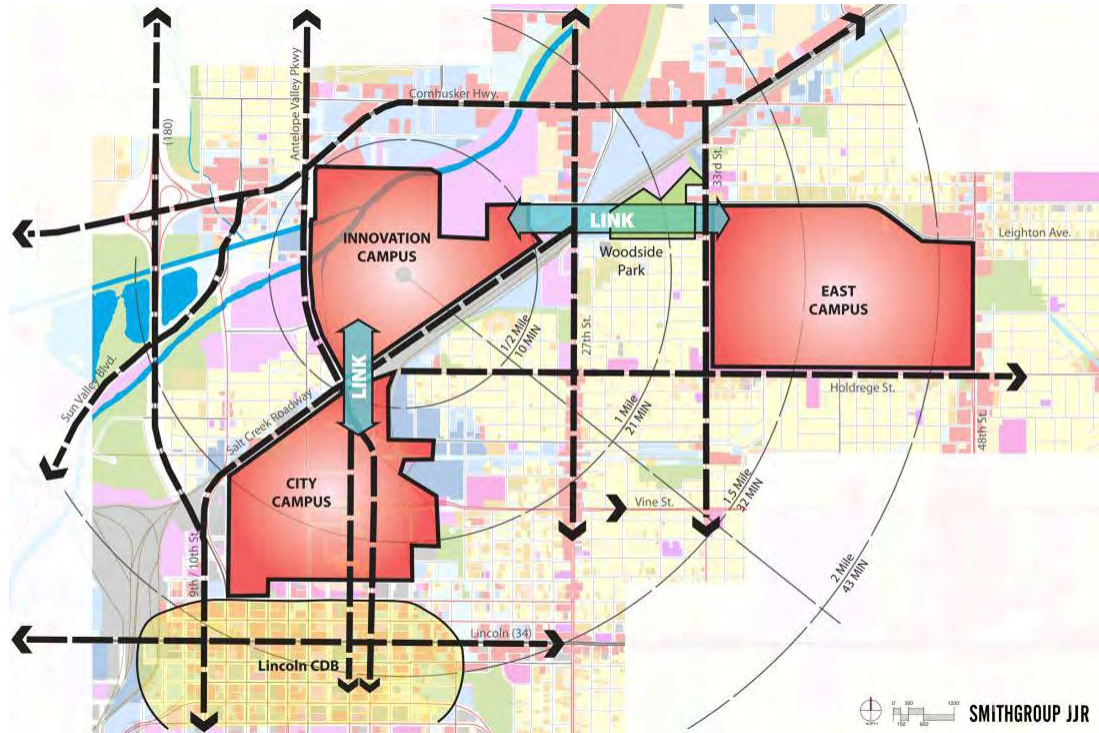
The Nebraska Innovation Campus (NIC) represents a rare opportunity for the University of Nebraska, the City of Lincoln and the State of Nebraska to capitalize on a unique resource. Redevelopment of this former state fairgrounds property into a state-of-the-art innovation and research campus creates a powerful economic development engine that will, over its twenty to twenty-five year build-out, produce substantial new public and private investment and a significant number of new high-quality jobs for the state and local economy. For the University, NIC provides a vehicle for expansion of its research capabilities, improved commercialization of its discoveries and more aggressive partnering with private sector research initiatives; all of which improve and advance educational opportunities.

To develop a viable business strategy for the NIC, the business strategy consulting team analyzed the City of Lincoln's competitive position against a range of peer communities, assessed the University's existing and emerging research strengths, and evaluated research campus best practices on a national basis. From this came a series of findings and recommendations that are integral to NIC's success.

In close collaboration with the Master Plan team, the University's current and projected requirements for interdisciplinary research facilities were assessed, the physical aspects of a competitive research campus were identified, a development strategy and program for NIC were determined and a market sensitive phasing plan was developed. Based upon the resulting Master Plan, the consulting team then estimated the "order of magnitude" cost for development of the NIC, and

identified potential funding sources and the essential attributes of a marketing plan. The overall business strategy is designed to achieve the vision and goals for the NIC and make it an economic and academic success.

When the State of Nebraska enacted LB 1116 in April 2008, the vision was to use the strengths of the University of Nebraska-Lincoln (UNL) to make an even greater contribution to the development



and growth of the Nebraska economy in the 21<sup>st</sup> century. By envisioning an exciting, alternative use for the State Fair Park, the leadership of the State took an unprecedented step that will grow research and promote commercialization activities by attracting partnerships with private corporations, government agencies, and other academic institutions.

Few universities in the nation will have such an opportunity in the 21<sup>st</sup> century. The NIC initiative gives UNL the opportunity to join an elite group of universities that can truly compete in a global economy for R&D activities that can both significantly add to the vitality of the region's economy and establish global networks that will increase research, learning, and business opportunities.

The physical development opportunities presented in the companion Master Plan are designed to maximize the positive impact of the NIC on the University of Nebraska, the local and state economy, and the quality of life in the region.

This potential can only be fully captured with the implementation of a Business Development Strategy for the NIC that is:

- comprehensive;
- based on existing research strengths, business conditions, and commercialization opportunities;
- driven by best practices for creating strong public/private partnerships,

governance structure, and management system;

- inclusive of key facilities that will have the greatest impact on research and commercialization, and
- competitive, innovative, flexible, and achievable

The Business Development Strategy described herein is designed to guide the University through the process of the successful organization, management, financing, development, and ultimately the realization of the fullest possible potential of the NIC Vision.

## UNL Strengths

The consultant team identified eight areas of research that represent strategic strengths for the University of Nebraska and serve as technology drivers to anchor the NIC development. These have been grouped into three categories representing UNL's core competencies:

- **Leading Edge Research Areas**
- **High Growth Potential Areas**
- **Areas of Significant Commercial Potential.**

Definitions of each category and details about the UNL research strengths in each area are detailed below.

### **Leading Edge Research Areas:**

The following three UNL centers of excellence represent those in which UNL possesses a critical mass of leading edge research with commercial potential:

- Agricultural Biotechnology, Life Sciences, Food and Nutrition
- Computer Sciences and Bioinformatics
- Materials Science and Nanotechnology

UNL's strengths in Agricultural Biotechnology, Life Sciences, Food and Nutrition are represented by the multi-disciplinary integration of plant sciences and biotechnology, redox biology, virology, nutri-genomics, food safety, large animal

genomics and many other research disciplines.

Computer Sciences and Bioinformatics strengths include work at the Raikes School and Peter Kiewit Institute (UNL/UNO partnership) in the fields of security and network logic, large data management, software engineering, and business services. The collaboration between computer science / computer engineering faculty and faculty in the humanities and applications ranging from drought mitigation to image processing is particularly impressive.

In the areas of Materials Science and Nanotechnology the critical mass is representative of research on touch-sensitive nano-particles, gold cage structures, novel polymers with medical applications (UNMC), and nano-medicine (UNMC).

### **High Growth Potential Areas:**

The consultant team identified the following opportunities of high growth potential where a substantial quality research portfolio exists at UNL on which to build:

- Natural Resources / Water Resources
- Clean Energy Technology

Strengths in water resources are well represented by Nebraska's unique position in aquifer management and water limited agricultural research, including sensing, simulation, plant sciences and weather management of agriculture. UNL has innovative management programs

associated with the Farm Information System, Drought Mitigation Center, Plains Regional Climate Center and Sand Hills Biocompatibility Center.

In the area of Clean Energy Technology UNL is home to the Nebraska Center for Energy Research and work involving bio-fuels energy system simulations, wind energy, energy generation efficiency, irrigation efficiency, carbon sequestration, distributed energy systems and high efficiency batteries and fuel cells. In addition, UNL has extensive research programs involving alternative biomass sources such as algae and switchgrass.

### **Areas of Significant Commercial Potential:**

The team identified three areas of research at UNL that hold significant commercial potential on which the NIC Business Strategy can build:

- Transportation / Engineering
- Chemical and Bio-Molecular Engineering
- Chemistry

Strengths are represented by work at the Mid-America Transportation Center including highway and railroad safety, and concrete structures (UNL/PKI). UNL's strength in Chemical and Bio-Molecular Engineering include research in blood chemistry, bacterial and yeast process development, and biomedical devices. The Chemistry Department's work in bio-imaging and carbon sequestration is a strong candidate for commercialization.

## Sponsored Research & Technology Transfer:

Total research funding at UNL increased nearly 13 percent in 2009 to a record level, more than \$122 million. Of that amount, \$84 million in sponsored research came from federal sources, the majority coming from the Departments of Health and Human Services (including the National Institutes of Health), National Science Foundation, U.S. Department of Agriculture, and the Department of Defense. UNL's federal research funding grew 15 percent from 2008. Private sector sponsored research represents \$10 million of the total \$122 million in research funding.

Since 2000 UNL research activity has spawned 12 new spinout companies, eight of which have been created since 2007. These were distributed as follows: six from the School of Engineering, four in the biotech area, and two in software development.

The consultant team confirmed that UNL's technology development office, NUtech Ventures, has been significantly strengthened over the past year through new leadership that is addressing internal processes with faculty as well as stronger outreach to area businesses. NUtech Ventures has identified an additional 12 potential start-up companies that could result from existing faculty research. Seven of these are biotech-related, primarily from Biological Systems

Engineering and Agriculture. Three are software-related from the Computer Sciences Department and two are from the School of Engineering. This pipeline could result in a doubling of the number of spinouts from UNL in the next year or two, equaling the output of the previous seven years.

### Conclusions:

From the standpoint of competitive positioning, UNL's ability to build on existing momentum is extremely significant. At any university, the level of external research funding defines the potential envelope of intellectual property holdings. Coupled with an effective technology transfer capability, this provides the necessary conditions to successfully spin out start-ups or pursue other forms of industry partnerships for commercializing university technology to populate the NIC.

Given UNL's core competencies, its growth in research funding, and the dynamism of the NUtech Ventures, the timing of the NIC initiative is positioned to capitalize on the wave of increasing federal investments.

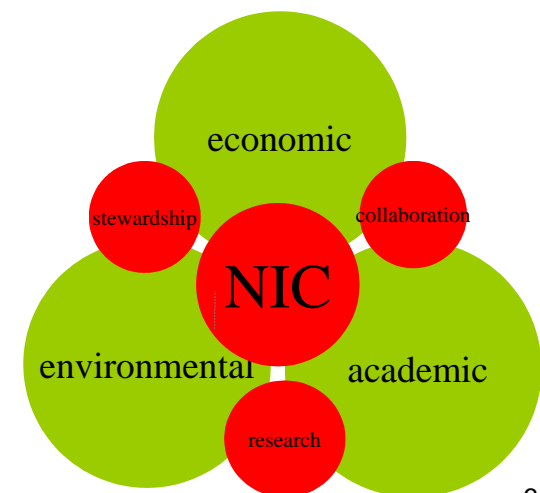
A window of opportunity is presenting itself that will allow UNL to significantly grow its sponsored research relative to its peers, and to generate a stream of commercialization activity that warrants the investment being recommended to launch the NIC development.

In fact, the NIC is positioned to act as a living laboratory at the intersection between the University's most compelling

research and some of the most challenging issues of our time: energy conservation, management of natural resources, and the health and nutrition of a global population. Its success will be fueled by a desire to maximize the utilization of human and natural resources, to collaborate with gifted researchers and professionals from private industry and public institutions - to meet the largest strategic needs of our society - all while driving the economic expansion of Nebraska.

The consultant team, in conjunction with the companion Master Planning team, has concluded that within the context of academic, economic, and environmental sustainability the NIC will be well served to leverage Nebraska's strengths to meet the world's most pressing needs:

- **Food, Fuel, and Water.**

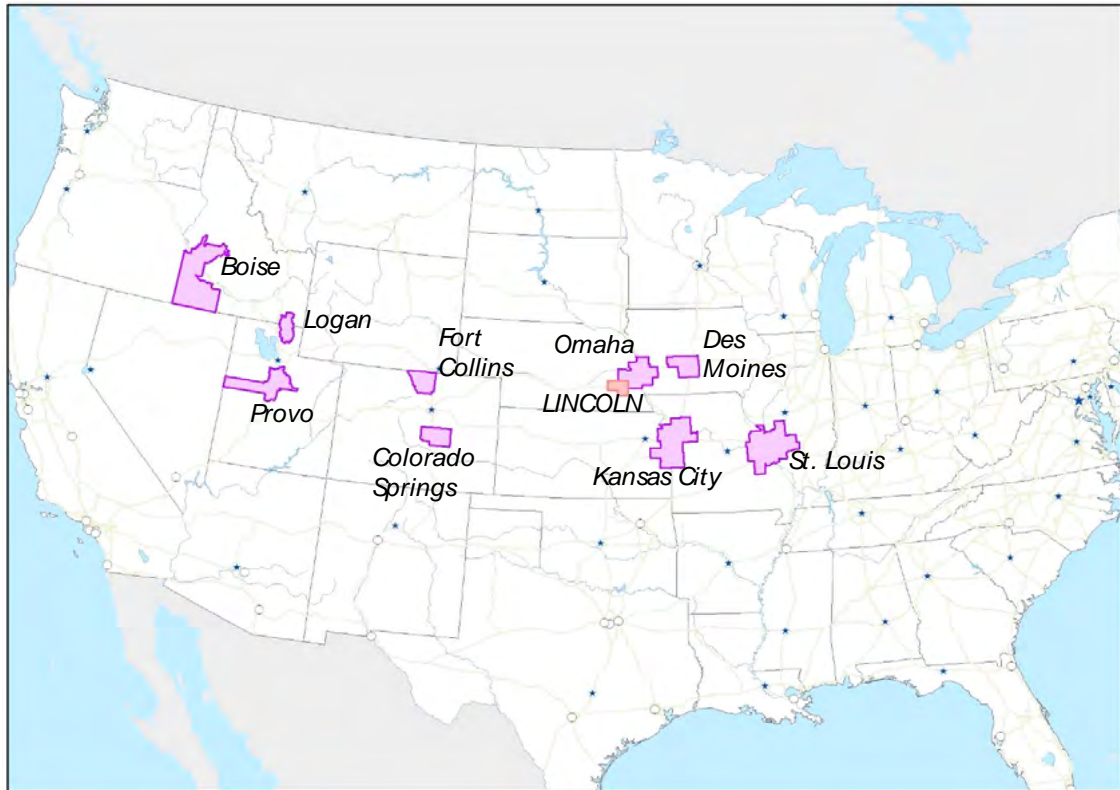


## B. COMPETITIVE POSITION: POSITION:

### Comparison Regions: Lifestyle & Academic Centers

The City of Lincoln provides an appealing quality of life for employees and is home to a large concentration of skilled workers. The city provides a business-friendly atmosphere for employers and offers a low cost of business. In 2008, Expansion Management Magazine named Lincoln the tenth (out of 329 metropolitan areas) “Best Places in the US to Locate a Company.” Lincoln has also been designated as “Healthiest US City” in 2008 by the Center for Disease Control, and “Top Digital City” for 2008 and 2009 by the Center for Digital Government.

This analysis considers Lincoln’s competitive positioning as compared to eighteen Metropolitan Statistical Areas (MSAs) across the United States - 9 comparable Regional Quality of Life MSA’s and 9 comparable Academic Centers of Excellence MSA’s.

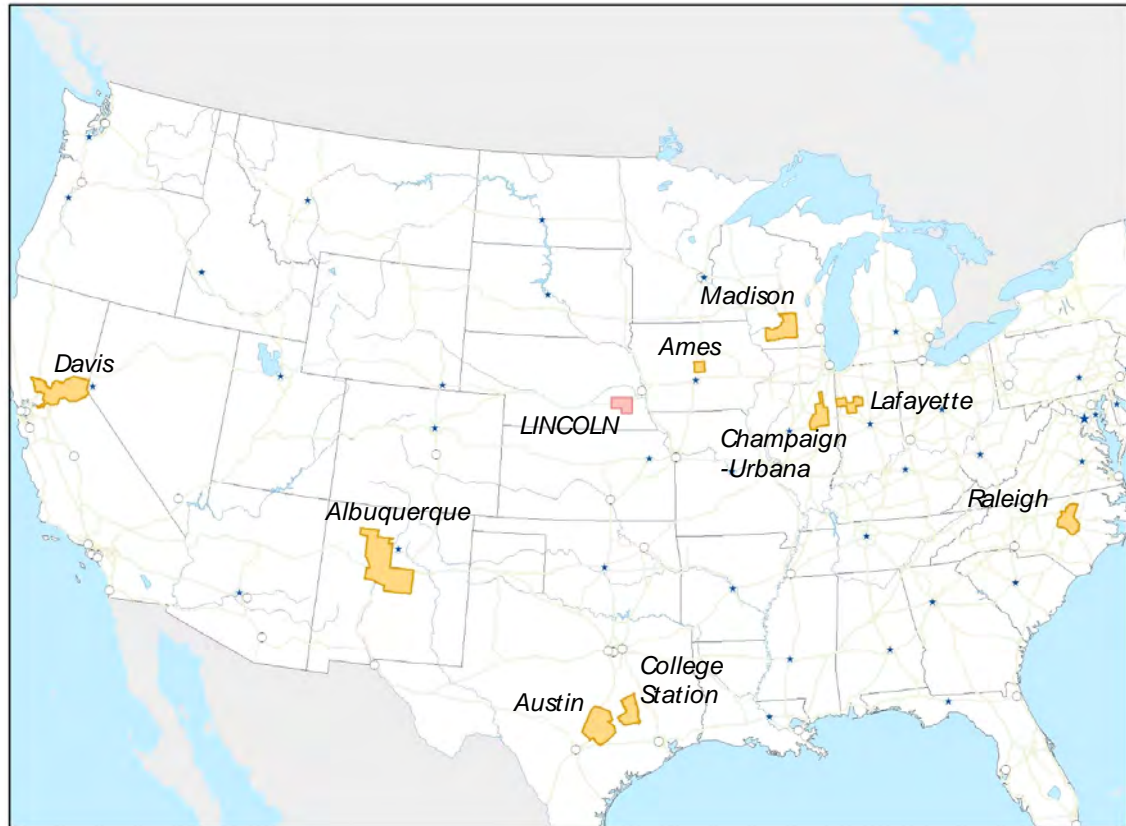


**Comparison Regional Quality of Life MSA’s - Boise, Logan, Provo, Fort Collins, Colorado Springs, Omaha, Kansas City, Des Moines, and St. Louis**

The metrics used are those commonly employed to evaluate an MSA's relative ability for attracting and developing new business, including:

- **Population Size:** Population and growth rate indicate the available labor force and the ability of the MSA to attract new business.
- **Household Income:** Reflects the cost of labor, a function of the types of industries and cost of living in the MSA.
- **Age:** Average age indicates the relative youth of the labor force.
- **Education:** Educational achievement indicates the quality of the labor force.
- **Employment:** Number of employees and growth rate indicate the size of the available labor force and the ability of the MSA to both grow and attract business.
- **Corporate Tax Rate:** The state level rate provides an indication of the overall tax burden for business.
- **Median Home Price:** Provides a benchmark for the cost of living in the MSA, and the relative attractiveness of the MSA.

The following findings highlight current demographic and socio-economic conditions in Lincoln.



**Comparison Academic Centers MSA's** - Sacramento (University of California Davis), Albuquerque (University of New Mexico), Austin (University of Texas Austin), College Station (Texas &M), Ames (Iowa State University), Madison (University of Wisconsin), Champaign-Urbana (University of Illinois), West Lafayette (Purdue University), and Raleigh (North Carolina State University)

## Population Size

- In 2008, the Lincoln MSA was home to about 292,500 residents, representing 16 percent of the total population of the State. The Lincoln MSA had an average annual population growth rate of 1.4 percent from 1990 to 2008.
- Among the MSAs with comparable qualities of life, Lincoln is one of the smallest; only Fort Collins and Logan are smaller. The comparison MSAs vary greatly in size, ranging from Logan (119,000) to St. Louis (2.9 million).
- The MSAs that grew the fastest between 2000 and 2008 were Provo, Boise, and Colorado Springs (3.8 percent to 1.9 percent annually).
- The slowest-growing MSAs were Kansas City, Lincoln, and St. Louis (1.3 percent to 0.7 percent annually).
- Among the comparison academic centers of excellence, Lincoln is the fourth smallest MSA. Others range in population size between 85,000 (Ames) to 2.2 million (Sacramento).
- The three largest academic center MSAs – Raleigh, Austin, and Sacramento – were also the fastest growing between 2000 and 2008; each grew between 3.7 and 2.3 percent annually.

## Income

- Lincoln has a relatively low average annual household income, which indicates that companies relocating to Lincoln will enjoy lower operating costs. Average median household income for the Lincoln MSA was \$69,000 in 2008.
- The average household income in the nine quality of life MSAs ranged from \$63,000 (Logan MSA) to \$77,000 (Kansas City) in 2008.
- The average household income in 2008 for the academic centers of excellence MSAs ranged from \$55,000 in College Station to \$89,000 in Raleigh. Lincoln's average household income was the second lowest of the nine comparison quality of life MSAs and fell in the middle of the income range for the nine academic centers of excellence MSAs.

## Age

- The median age for the Lincoln MSA in 2008 was 33.7 years. The presence and relative size of the University of Nebraska helped Lincoln achieve the third lowest median age of the nine quality of life comparison MSAs.
- Lincoln falls in the bottom half of comparison MSAs with academic centers of excellence, which have a median age ranging from 26.2 in College Station to 35.8 in Albuquerque. The presence of the universities in each of the comparison academic centers of excellence MSAs accounts for the lower median ages.

## Education

- Roughly 30 percent of Lincoln's residents have obtained a bachelors degree or higher. Of the quality of life MSAs, only Fort Collins, which houses Colorado State University, had a higher share of its population that obtained a bachelors or masters degree.
- Among the comparison academic center of excellence MSAs, all have highly education populations. The share of population older than 25 with a bachelor's degree or higher ranges from 24 percent in Sacramento to 43 percent in Ames.



## Employment

- In 2007, 162,000 individuals were employed in the Lincoln MSA. Government is the largest employer, providing 20 percent of jobs in the MSA. Other dominant industry sectors are Trade, Transportation and Utilities; Education and Health Services; Professional and Business Services; and Leisure and Hospitality.
- Seventeen companies / agencies employed more than 1,000 people in Lincoln in 2008. Six of the largest employers were in the public sector and eleven in the private sector. The three largest employers are the Lincoln Public Schools, the State of Nebraska, and the University of Nebraska – Lincoln; each of those employed between 5,000 and 7,500 workers in 2008.
- Total employment grew, on average, by 1.0 percent annually between 2000 and 2007. Over that period, the private sector grew by 1.0 percent annually while the government sector grew by 0.8 percent annually. The fastest growing industry sectors from 2000 to 2007 include Financial Activities (3.2 percent annual growth); Education and Health Services (3.0 percent annual growth); and Trade, Transportation and Utilities (1.7 percent annual growth).
- The workforce is largely self-contained. The US Census indicates that over 90 percent of the Lincoln MSA workforce lives in the metropolitan area, and an even larger

share, 95 percent, of Lincoln MSA residents work in the metropolitan area.

- Unemployment rates have historically remained low. With a ten-year average annual unemployment rate of 3.0 percent, the unemployment rate in the Lincoln MSA is among the lowest in the region.
- Employment size generally corresponds to the population size, and the competitive MSA's with the largest population sizes also had the largest employment bases. The three comparison quality of life MSA's that experienced the greatest growth in employment between 2000 and 2008 were Logan, Provo, and Fort Collins (2.6 to 1.2 percent annually) while the slowest growing were Colorado Springs, Des Moines, and Boise (0 to negative 2 percent annually). Lincoln falls in the middle of the group with a 0.7 percent annual growth in employment between 2000 and 2008, slightly faster than Omaha. Of the academic center of excellence benchmark MSA's, those with the greatest employment growth between 2000 and 2008 were Raleigh, College Station, and Madison. Employment in Lincoln is growing at the average rate of the comparison academic centers of excellence MSA's.

## Corporate Tax Rate

- The 2008 corporate tax rate in the comparison quality of life MSA's ranged from 4 percent in Kansas City to up to 12 percent in Des Moines. The Lincoln MSA corporate tax rate ranged between 5.58 to 7.81 percent, and tied for the third highest corporate tax burden along with Omaha.
- The corporate tax rate in 2008 for the comparison academic centers of excellence MSA's ranged between zero percent in Austin and College Station, Texas to 12 percent in Ames, Iowa. Lincoln had the fourth lowest tax burden in this benchmarked group.

## Median Home Price

- The quality of life MSA's have relatively similar median home prices. Omaha has the lowest median home price at \$139,000 while Fort Collins has the highest at \$240,000. Lincoln has the second lowest median home price at \$141,000.
- Besides Sacramento, the academic center of excellence MSA's have relatively similar median home prices, as well. College Station has the lowest median home price at \$116,000 while Madison has the highest at \$214,000. Sacramento had a median home price of \$408,000 in 2008, which was the highest median home price of the comparison MSAs. Lincoln has the fourth lowest median home price at \$141,000.

## Conclusions

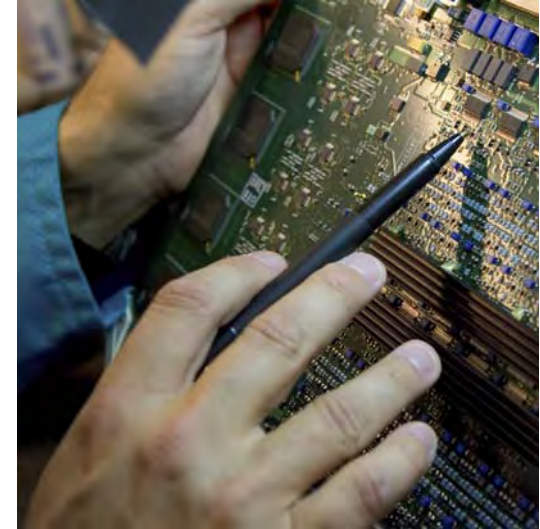
The analysis of MSA's with similar qualities of life and academic centers of excellence indicate that Lincoln is well positioned to host the NIC. Lincoln offers the private and academic sectors a young population, low home prices, and high levels of educational attainment. Moreover, the analysis of MSA's with academic centers of excellence demonstrates that regions with smaller population and workforce sizes, such as Lincoln, are not precluded from supporting thriving research and innovation centers.

Demographic and socio-economic trends within the Lincoln MSA indicate that Lincoln is a dynamic city in which local businesses can grow and to which new businesses can successfully relocate. The city's relative concentration of young and educated professionals (individuals ages 20 to 39 who have earned a bachelor's degree or higher) demonstrates that Lincoln has a young workforce from which innovation companies can draw.

Moreover, this young professional cluster will attract services, entertainment, and residential developments that are geared to a young professional lifestyle. Finally, the relatively low average annual household income (\$69,000 in 2008) offers companies that relocate to Lincoln an opportunity to reduce operating costs. Of the comparison quality of life MSA's, none stand out as having significantly greater competitive advantages for attracting new business. Provo and Colorado Springs have become recent

leaders with high population growth since 2000, but have relatively high corporate tax rates and high home prices. The Midwest cities (Kansas City, St. Louis, and Omaha) are the largest, but have been slow-growing. They tend to have some of the oldest populations and relatively smaller concentrations of advanced degree holders.

The MSA's with academic centers of excellence are highly differentiated. Austin and Raleigh stand out competitively as leaders due to their larger size, fast growth, educated workforce, and high incomes. However, the capacity of all of comparison academic center MSAs that were studied shows that such MSA's can support thriving centers of research innovation and technology commercialization in spite of smaller populations, lower employment growth, higher corporate tax rates, and other metrics used to compare metropolitan areas.



*“The significant recent growth of research, both at UNL and the University of Nebraska Medical Center holds promise for attracting private sector partners who may wish to collaborate or commercialize the products of University research.”*

- drawn from original UNL NIC Proposal

## Regional Leadership Perspectives and Business Technology Drivers

The consultant team validated the recommended NIC Business Development Strategy via interviews with community leaders outside the University administration and faculty. The team interviewed in-person or by phone more than 90 external stakeholders in both Lincoln and Omaha between May and September, 2009.

This element of our work had two goals:

- Fostering a “shared vision” and sense of engagement with NIC planning among external stakeholders that would help ensure the development’s early momentum and its long-term success; and
- Identifying external (non-University) technology demand drivers within the region’s corporate sector

A key premise of the investigation was to demonstrate that the NIC will be most successful if its business strategy draws on the greatest strengths of both the University and its regional corporate base.

### Major Themes from Stakeholder Interviews

From the perspective of Lincoln’s community leadership -- both public and private -- the NIC initiative is seen as offering the greatest economic development opportunity foreseeable over the next forty years.

The earlier displeasure expressed by some over the relocation of the state fairgrounds has passed: the view going forward is based on positive expectations for creating and attracting new businesses and new jobs. The NIC initiative is seen as a way to create a more meaningful brand for the City of Lincoln and a more powerful brand for UNL. It is expected to have a catalytic impact on the perception of Nebraska in the United States and the world -- from business centers of influence to families, to UNL alumni and young professionals looking for opportunities in the Midwest.

Lincoln’s leadership is also eager to directly participate in the growth and success of the NIC in whatever form that may take, whether in an actual research and development initiative, a business relationship on site, a position on the NIC governance or advisory bodies, support with creating new economic development incentives, or in some other fashion. Local off-campus leaders are highly engaged and ready to support the University in pursuing the next steps required to implement the overall initiative. The greatest test of this commitment may be the extent to which the business community will support an aggressive

approach to raising venture capital of sufficient scale to make Nebraska and the NIC truly competitive.

A strong message from Lincoln stakeholders is for the University leadership to ensure early successes within the first few years; this is defined as excluding the mere relocation of existing UNL programs or departments from the two existing campuses. Community leaders see the goals of the NIC development as promoting net new research, net new business operations and new jobs.

A concern identified by some stakeholders was the risk that nothing new would be brought to the NIC within its first few years of development. If this occurs, local business support could be dampened and the sense of a shared vision for the NIC that exists presently could be adversely affected.

Top business leaders and successful Lincoln entrepreneurs alike commented that the new development needs to promote a strong sense of place and a quality of life that will be attractive for the young professionals who will be the targets for many of the jobs to be created at the NIC, and to Lincoln itself.

From a marketing standpoint, the team found a consensus among business leaders that the University’s centers of excellence theme of “Food, Fuel and Water” can be a powerful demand driver if properly branded as a response to global

concerns about sustainability. These focus areas are sufficiently broad to encompass a wide array of the technologies and areas of human capital development at which UNL excels. Such a theme also provides the basis to leverage UNL's partnership with the Peter Kiewit Institute and the Raikes School - both seen as "star programs".

### **Technology Company Interview Findings**

The consultant team found that Lincoln has a strong and long-standing culture of entrepreneurship, with a track record for successful commercialization of new technologies. The general absence of institutional venture capital notwithstanding, Lincoln is well populated with small, medium-sized and large companies that were founded here and whose current management retains an entrepreneurial business style, even after being sold to national or multi-national corporations. Locally-founded companies, even when acquired by national firms or non-local entrepreneurs, frequently remain and grow in Lincoln. Their Lincoln-based founders and managers retain great loyalty to the community and to UNL's agenda.

In addition to companies that have been formally identified by UNL as spin-outs based on faculty research, the interviews identified a substantial number of recent and long-established Lincoln companies founded by UNL graduates, whose senior management are largely comprised of UNL graduates. These covered a mix of hard

sciences, information technology and business services companies.

Finally, through informal business networks as well as those promoted by the Lincoln Chamber of Commerce, a nexus of established business leaders and young entrepreneurs is emerging, coalescing in part around the studio program of the Raikes School. Recent UNL grads that were interviewed want to help commercialize intellectual property (IP) coming out of the University's scientific focus areas. In general, the consulting team believes that Lincoln's abundance of entrepreneurial energy can be harnessed to help drive NIC's success.

### **Diverse Business Sector Opportunities**

Examining the cross section of companies represented in Lincoln reveals a diverse mix of both technology-driven and traditional business sectors.

- **Information Technology & Business Services**

With help from the Lincoln Chamber of Commerce the consulting team found an extremely high concentration of information technology (IT) firms (including business & consumer services) across the regional economy. Tapping into this interest within an industry sector whose companies are, in general, more prone to rapid growth than those in the biological sciences, may present a ready opportunity that could fuel the NIC' early success.

Leaders from Lincoln's information technology sector are closely following the NIC' planning process and uniformly expressed themselves as "ready to engage" with the University to advance the project's development. Information technology executives consistently cited the importance to their industry of "proximity to facilities, equipment & talent" -- pointing out that Lincoln already offers an advantage in term of access to talent. They would like to see the NIC build on this existing strength by offering features such as access to a data center (for security and redundancy); provision of additional bandwidth to serve the region; and access to a concept development lab capable of providing high performance quality assurance testing and a demonstration site for clients to try new software and applications.

- **Healthcare Services**

While lacking the major research focus of Omaha's academic medical center, Lincoln's robust healthcare services sector is poised to provide significant leadership to advance the NIC agenda. Healthcare executives in Lincoln understand the technology commercialization process, and the importance of incubation facilities as venues that foster innovation and as magnets to attract new companies to the region. Opportunities exist to create partnerships with Lincoln's healthcare organizations to promote the commercialization of University

research across a broad, multi-disciplinary spectrum of applied technologies and services, ranging from further development of clinical trials to medical-related information technology, and medical product development -- particularly for medical devices.

- **Traditional Manufacturing**

The consulting team found evidence of many opportunities to promote technology commercialization and joint research partnerships within Lincoln's traditional manufacturing sector. Manufacturing in Lincoln is remarkably strong relative to the U.S. as a whole, and the industry segments represented in Lincoln appear to remain competitive globally.

The interviewees from Lincoln's traditional manufacturing companies want to be seen as partners in the region's economic development; want to be engaged with the University (beyond just hiring its graduates); and look to the NIC as a way for the University to support their significant need for continuous innovation. Companies cited opportunities to collaborate in the application of advanced technologies to manufacturing products and production processes, and in fields such as performance testing of components and materials. The concept of a "Center for Advanced Manufacturing Technologies" was suggested by some as a type of forum

to promote more interaction with local businesses – both traditional manufacturing and technology-based.

During interviews, a number of successful Lincoln companies – including the local operations of some multi-nationals corporations – stated they are open to considering a presence at the NIC, whether for expansion, relocation, a satellite operation, or some form of university partnership. A number of Lincoln-based companies were identified that have the potential to establish their own spin-offs at the NIC.

The facility needs of these companies vary widely, from potential free-standing, owner-occupied buildings to space in multi-tenant buildings, to those seeking true incubator space and program support for start-ups. Interviews indicate that the need for space from fast-growing "post-incubator" companies is an important market segment to address.

## **Conclusions**

An overarching need cited by Lincoln companies of all types – including traditional manufacturing and companies that may not plan to directly locate at the NIC -- is for "interaction space"; defined as a place where regional companies can connect to University resources of all types, as well as network among themselves in their search for technology innovation solutions.

These regional industry demand drivers -- in tandem with the University's own research opportunities and needs -- validate and reinforce the vision and specific aspirations that the University has set for the Nebraska NIC initiative. Taken together, they have established many of the assumptions for the consulting team's recommended real estate development program and business strategy.



*“The concept of the NIC is to develop a premier private/public sector sustainable research campus capitalizing on research growth and research expertise of UNL faculty.”*

- drawn from original UNL NIC Proposal

## C. BEST PRACTICES & COMMERCIALIZATION RECOMENDATIONS

Throughout this engagement, the consulting team has organized its investigation to align with core precepts first outlined in UNL's Request for Proposals. Through the team's engagement with University leadership at all levels (Regents, Steering Committee, top administrators and faculty) the team has refined and focused their understanding of the NIC vision and mission, and the criteria by which its success will be measured.

In bringing forward the details of the findings and establishing the foundations for the Business Strategy recommendations, the consulting team has been guided by a series of strategic and tactical goals that capture the essence of the NIC initiative.

### Strategic goals:

- Expand and accelerate the creation and attraction of high technology companies
- Create new high quality, high wage jobs for Nebraska
- Increase and accelerate the transfer of UNL technology and its commercialization

- Plan a physical environment and facilities for leading-edge research leveraging the University's strengths

### Tactical goals:

- Engage the private sector and community in the governance, funding and development of the NIC
- Create a competitive advantage for the NIC in the attraction of companies, research initiatives and programs
- Maximize the income generating potential of the NIC (both internally and externally)
- Develop an innovative and flexible set of development tools and financing options

The consulting team's recommendations, respond to the imperative of these Strategic and Tactical goals, while incorporating additional insights gained from the investigation of successful university research parks and technology commercialization programs across the nation.

## Research Park Best Practices

In order to ascertain the most appropriate model for the NIC initiative, a comprehensive analysis was conducted to compare the governance and management structure of over 62 university research parks in North America. Key factors of comparison included size, location, governance and management structure,

type of development, university uses on-site, green or brown field sites and the amount and type of public-private partnership opportunities. Additional comparisons included examining "outstanding" or "top performing" parks as identified by the Association of University Research Parks (AURP). The analysis also drew further on the findings of a 2007 study conducted by the Battelle Institute, "Characteristics of North American Research Parks" and a 2006 study by AURP, "Park Profile & Membership Directory."

Universities employ a wide variety of different governance approaches to develop and manage research parks and campuses. The consulting team examined five common governance models used by the majority of university research parks in North America. These are:

- University managed model
- University foundation model
- Independent foundation model
- University affiliated corporation model
- Private sector model

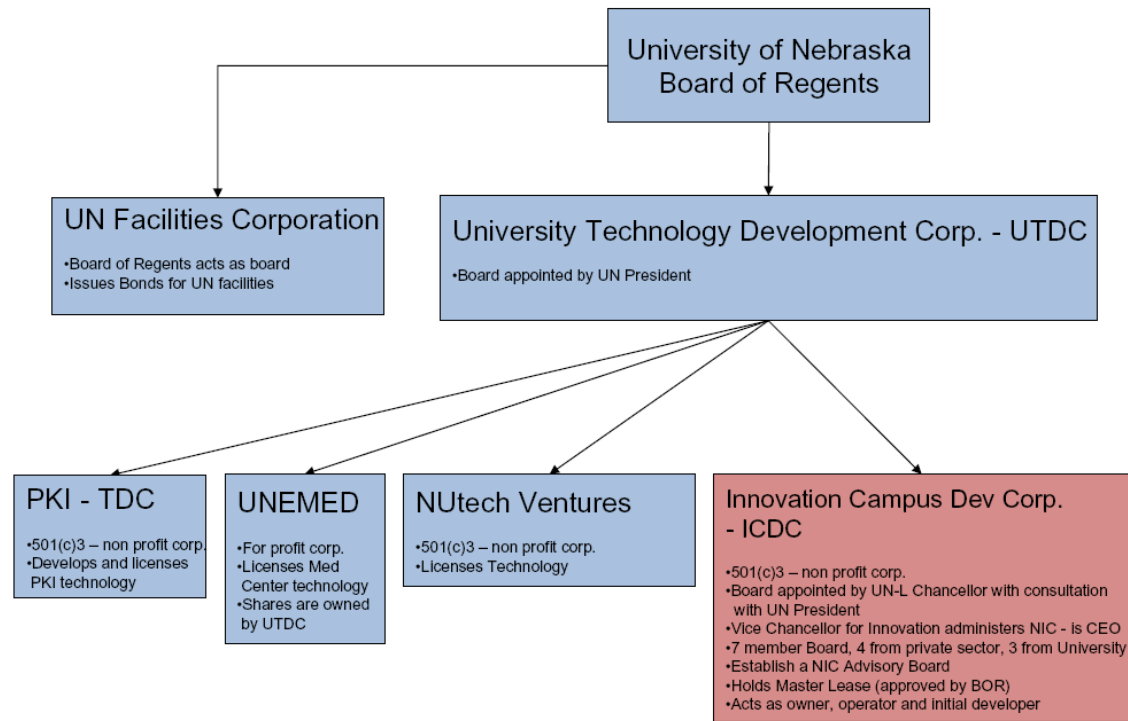
Each of these provides advantages and disadvantages depending on the goals of the university and the opportunities and constraints related to acquiring land and financing development.



## Governance Recommendations

Based on a thorough analysis of the five representative models against the NIC objectives, it is recommended that the University adopt the university affiliated/public-private partnership model, as follows:

A non-profit (501 c 3) entity, Nebraska NIC Development Corporation (ICDC), would be created under the umbrella of the existing University Technology Development Corporation (UTDC). This entity would have responsibility to assist the Board of Regents on behalf of the University of Nebraska – Lincoln in the acquisition, financing, improvement and operation of campus, research park and other related properties including the design, development, construction, marketing and leasing of land and/or space. The recommended structure is illustrated in the accompanying diagram:



A primary responsibility of any governance structure is to provide the University and Board of Regents with sufficient oversight to ensure that critical goals and objectives are met and the University’s physical and financial assets are protected.

The new corporation would be comprised of a Board of Directors, organized as follows:

- Board appointed by UNL Chancellor in consultation with NU President
- 7 voting members
  - Private Sector Directors (4)
  - University Directors (3)

With this governance structure, a master lease for the land at the NIC should be executed between the Board of Regents and the Nebraska NIC Development Corp (ICDC). The lease would ensure that development of the NIC meets the development and operational requirements of both the Board of Regents and

University. ICDC would be required to develop and submit a master land use plan and an annual report that includes metrics to ensure that the project is meeting the strategic goals of the Regents and University.

It is also recommended that the University create an NIC Advisory Board of key university and community stakeholders. This advisory board would provide guidance for the direction of the NIC as well as create strategic linkages to the community and state.

There are several advantages to the university affiliated/private-public model for both the University and its prospective tenants. These advantages include:

- Guidance of the NIC’s operation is under University leadership
- Sole purpose of the corporation is to assist in the development and management of NIC
- Employs a wide variety of funding and financing mechanisms, techniques and entities
- Protects proprietary tenant and financial information
- Provides for off-balance financing wherever possible
- Establishes policies and procedures providing for quicker response to market factors and conditions
- Operates with University tax benefits on land and improvements through the terms of a master land lease or enabling legislation

## Management Recommendations

It is recommended that a new senior level University position be created – Vice Chancellor for Innovation. This position would direct the operational activities of NIC core, its facilities and serve as the ICDC CEO. This position would be responsible for coordinating and aligning the activities, programs and initiatives related to development and marketing of the NIC. The Vice Chancellor for Innovation would be responsible for furthering innovation and commercialization in partnership with NUtech Ventures and the Peter Kiewit Institute. This position would serve as an ex-officio director and non-voting member of the Board.

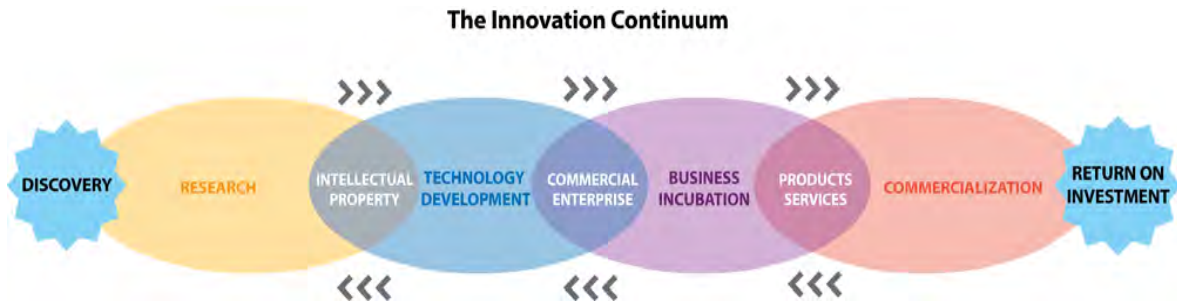
## Technology Commercialization Models

Technology innovation and commercialization is at the heart of the vision of NIC. The NIC is the tool that will

allow the University to move new technology out of the laboratory into the market place. Technology innovation is a complex and challenging process. The development of new technology moves through a series of developmental steps and involves a continuum of activities, which constitute the commercialization process.

A comprehensive analysis was conducted examining the key characteristics of 57 technology incubators. This analysis was supplemented by the 2006 Industry Report of the National Business Incubation Association (NBIA), interviews with 90 Nebraska corporate leaders, case studies of high performing and innovative technology incubation programs, and research park site visits.

An alternative to the traditional commercialization process is emerging - the Innovation Continuum. The graphic demonstrates technology commercialization as a series of inter-related activities that overlap and are part



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of a continuum of the commercialization life-cycle. The University is urged to adopt this model as it moves forward in pursuing a more active and engaged technology transfer and technology commercialization program for the NIC.

### **Commercialization Recommendations**

A careful assessment was conducted of UNL's existing technology transfer infrastructure through interviews with administrators, program managers, research faculty, and business leaders or owners. From these interviews it is clear that many of the critical components of a successful commercialization program are already in place. As a consequence, the University has laid a solid foundation for improving its tech transfer and technology commercialization process. Some examples include:

- A cluster of key faculty interested in commercializing technology and entrepreneurship – particularly with students in the Raikes School
- A strong commitment to improve, accelerate and expand technology commercialization at UNL
- An entrepreneurial climate exists in Lincoln, particularly in the information technology sector

However, several challenges still exist and create the opportunity for further improvement in the tech transfer and technology commercialization process. These include:

- University commercialization activities are discrete and disconnected
- Community has been unsure how the technology transfer process works
- Limited inducements/incentives for faculty engagement in technology transfer (promotion and tenure)

Out of this research has evolved recommendations regarding programs, funding and facilities. Each of these is designed to promote the technology transfer and commercialization activities of the University, while providing the necessary tools to encourage entrepreneurship in the University and Nebraska's research community. By providing these tools, the University will assist in the economic development of Nebraska, by growing technology ventures that will create new, high quality, high paying jobs in the community. Ultimately, technology incubation and commercialization are core functions – they are the sparks that make everything else happen.

### **Commercialization Funding Recommendations**

- Engage university and community stakeholders in a long-term commitment to funding an incubator facility and operations.
- Advocate for establishment of a Nebraska Venture Fund (NVF) to provide early seed and later stage venture funding for university commercialization enterprises and efforts.

## **Facility Recommendations:**

Through discussions with UNL administrators, focus group meetings with faculty, and direct inspection of existing University research facilities by the consultant team, certain themes emerged regarding the assets represented by existing facilities and prospective University facility needs that could be located at the NIC site. These include:

- **4H Building Renovation**  
A central structure of the former fairgrounds is the 4H Building. Given the physical characteristics of the structure, we recommend its repurposing as the NIC's central conferencing facility. The building is well suited for both small and large group meeting spaces and tiered-floor seminar facilities. The 4H Building is recommended to also host a central food service/catering operation, and an initial 20,000 square foot business incubator. As the NIC matures and the need for heavy technology-laden space increases, the incubator can evolve into the NIC's central business development center. Further, the 4H Building is envisioned to contain a sizable lobby to support large gatherings along with display and demonstration of research being conducted in the park.

- **Innovation Center:**  
A consensus exists on the need for a state-of-the art business incubation facility at the NIC. This view is shared by a majority of the faculty, research administration, and technology transfer leadership. Interviews with Lincoln area technology companies reinforced the importance of having such a facility at the NIC. Based on successful national models, the consulting team recommends that this facility should optimally be in the range of 40,000 to 45,000 square feet, and should include flexible wet and dry laboratories, a clean room and high-bay demonstration space.

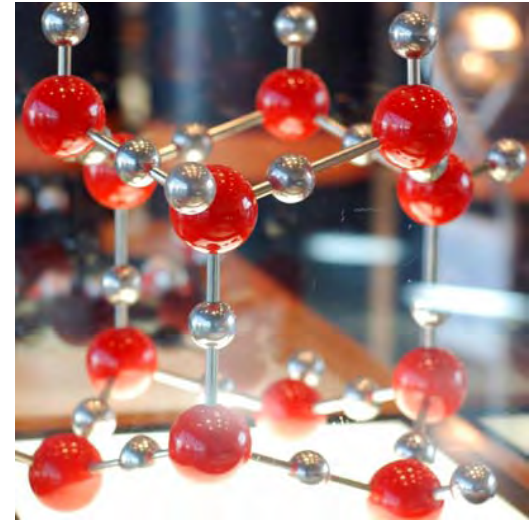
Beyond creating a facility to house start-up companies, NIC programming should also help to integrate the Business School with UNL's programs of research excellence through expansion of its entrepreneurship and intern programs.

Along with the Innovation Center it is recommended the following key components of the Innovation Continuum should be co-located at the NIC: NUtech Ventures, a business development center, and university core research facilities.

- **Agriculture Biotechnology / Life Sciences:**  
Present facilities are scattered between the Beadle Center, the Morrison Center and the East Campus, with additional activities at UNMC in Omaha. The consultant team anticipates that expanded facilities will be needed soon in many of these areas of research. A high level of need has been identified for highly flexible space that can house and promote interdisciplinary projects, such as to integrating scientists with bioinformaticists.
- **Clean Energy, Water Resources and Bio-fuels:**  
These programs are managed from the Whittier building; but there is a need for project related engineering facilities for proof of concept devices and demonstration projects. Much of this work also will be done in the field.
- **Imaging Center:**  
A central imaging and sophisticated centralized instrument analytical center also was a common theme among all groups interviewed. The imaging center might be the best way to continue UNL's excellence in integrating the computer sciences with the humanities.
- **Multi-Tenant Lab/Office**  
A key element of the initial Phase of development should be a multi-tenant lab facility to accommodate post-incubation companies and small-to-

medium sized companies that wish to partner with the University or with other companies at the NIC.

- **Other Uses**  
Interviews across the University community and with Lincoln area businesses indicated significant interest in seeing retail, residential and recreational elements as part of the new NIC development.
- **Industrial Arts Building**  
Finally, the business strategy team explored the potential for the adaptive reuse of this structure. Because of its size, shape, configuration, physical condition, renovation cost and location the team does not believe that it is commercially practical to reuse this building and has, therefore, recommended its removal.



*“While the University is not indifferent to also generating a stream of revenue, the primary objective is to generate a catalyst for enhanced technology development in Nebraska.”*

- drawn from original UNL NIC Proposal

## D. PROJECT COSTS AND ECONOMIC IMPACT

Based upon the infrastructure requirements identified in the NIC Master Plan, and the development program, which incorporates elements of the facility recommendations derived from both campus and external community interviews, the consultant team has provided an initial estimate of overall development costs for the NIC on an “order of magnitude” basis. These estimates were divided into three major categories:

1. Demolition of all existing structures (excluding 4H, Ice Box, Armory, and Devaney Sports Center) and surface improvements not being retained for future development, abandonment or removal of existing utilities and other sub-surface structures, and rough grading of the site to prepare future building pad locations.
2. Installation of new infrastructure to support development of the Campus including roads, sanitary and storm sewers, gas and water lines, telecommunication and data transmission networks, streetscape and general site lighting.
3. Vertical construction of buildings and other facilities. These estimates include allowances for related site development, surface parking to serve each facility, and tenant improvements. These costs also

include a specific preliminary estimate for renovation and conversion of the existing 4H building into an initial campus innovation center, conference center, and central commons.

These cost estimates include projected expenses for design, testing, fees and other such customary project related costs.

The development program and cost estimates are shown on the following page.

The cost estimates were applied to the project’s phasing plan to produce order of magnitude estimates for Phase I development, Future Phases and Full Project Build-out.



	Development Program (SF)	Phase I Construction Costs	Future Phases Construction Costs	Full Build-Out Total Construction Costs
<b><u>1) Demolition and Grading:</u></b>		3,651,800	9,888,200	13,540,000
<b><u>2) Infrastructure:</u></b>		15,787,200	20,849,800	36,637,000
<u>Site preparation &amp; Infrastructure Subtotal:</u>		19,439,000	30,738,000	50,177,000
<b><u>3) Buildings &amp; Facilities:</u></b>				
<u>USDA/ ARS Building:</u>	70,000 SF	39,915,000		39,915,000
<u>4-H Building Renovation With 400 Stall Parking Lot:</u>	65,500 SF	21,507,700		21,507,700
<u>University Research Building:</u>	100,000 SF	56,450,700		56,450,700
<u>Hotel:</u>	135 Rooms - 65,000 SF	18,130,700		18,130,700
<u>Public/ Private Multi-Tenant Office/ Lab Building:</u>	100,000 SF	39,847,500		39,847,500
<u>Phase I Subtotal:</u>	400,500 SF	175,851,600		
<u>Core Support Buildings:</u> (High Bay Demonstration Facilities/ Core Lab/ Analytical Equipment)	135,000 SF		53,794,200	53,794,200
<u>Innovation Center:</u>	45,000 SF		17,931,500	17,931,500
<u>University Research Buildings:</u>	300,000 SF		169,351,900	169,351,900
<u>Private Office/ Lab Buildings:</u>	557,000 SF		276,207,300	276,207,300
<u>Multi Family Residential Complex :</u>	250 Units - 262,500 SF		38,187,300	38,187,300
<u>Retail / Service Spaces:</u>	100,000 SF		19,923,800	19,923,800
<u>Future Build-out Subtotal:</u>	1,399,500 SF		575,396,000	751,247,600
<b><u>Total:</u></b>	1,800,000 SF	195,290,600	606,134,000	801,424,600

Note: Estimates are based on average costs for like-kind facilities in 2009 dollars.

### Economic Impact

Development of the NIC will have a substantial positive economic impact on the local community and State of Nebraska. In addition to the over \$800 million of new investment in buildings and facilities, with the corresponding construction employment such investment will generate, it is estimated that at full build-out the Campus will provide direct employment of 2,835 Full Time Equivalent (FTE) people. Assuming 75 percent of these are new jobs to the region, the NIC will generate 2,215 net new direct jobs. The bulk of these positions will be high-paying research and technician jobs which are projected to average \$70,000 per year in 2009 dollars. That equates to a projected direct annual payroll of \$148,750,000 in 2009 dollars.

Using a commonly accepted multiplier of 1.6 indirect jobs for every direct position, the spin-off benefits from NIC should result in the addition of 3,400 net new indirect jobs to the local economy. At Lincoln's 2007 average annual salary of \$34,750, the indirect impact will be approximately \$118,150,000 in new annual indirect payroll.

Therefore, at full build-out the NIC will produce approximately 5,525 net new jobs for an additional annual payroll to the local and state economy of \$266,900,000, plus the related corporate earnings that would be generated by companies moving into or growing within the state.

The effects of this additional economic activity on annual state and local government tax revenues will be significant in a variety of revenue categories: income (individual and corporate), sales, and property. Together, those three sources account for more than 85% of the total public sector income in Nebraska.

Such long-term annual increases of public sector revenues are the basis of almost all public sector support programs that induce this kind of core economic growth, but few opportunities exist to produce this level of economic impact with a single action. The Nebraska NIC represents one of the most significant economic development projects in the recent history of Lincoln and the State of Nebraska.







*“The University envisions a relationship between the University and Business Development Strategy Consultant through which the University’s Central mission and vision for the NIC can be voiced and derived.”*

*- drawn from original UNL NIC Proposal*

## E. FINANCING STRUCTURES

Development of the NIC will require a broad range of financing structures and funding sources to sustain the projects capital, operational and programmatic requirements. These sources will include conventional and creative types, both public and private. In addition, each stage of the project will need to draw upon a blend of various financing methods to meet funding objectives.

The consulting team has identified an extensive list of potential financing and funding sources that can be applied to various elements of the project, including those provided in the State's Community Development laws for infrastructure and public facility development, and the Nebraska Advantage Act for business expansion and recruitment. The major development, operations, and program categories, with the applicable potential funding sources for each, are show below.

### Infrastructure

- Tax Increment Financing
- Improvement District Financing (SA bonds)
- University Facility Bonds
- Federal Grants & Tax Incentives
- Private Developer Debt & Equity Financing
- State Sources
- University Sources
- University Foundation
- Philanthropy
- Land and Facility Lease (Sale) Income

### University Facilities

- Industrial Development Bonds
- University Facility Bonds
- Federal Grants & Tax Incentives
- Industry Partnerships
- University F&A Income
- Private Developer Debt & Equity Financing
- State Sources
- University Sources
- University Foundation
  - Philanthropy
  - Land and Facility Lease (Sale) Income
  - Project and Program Income

### Private Projects

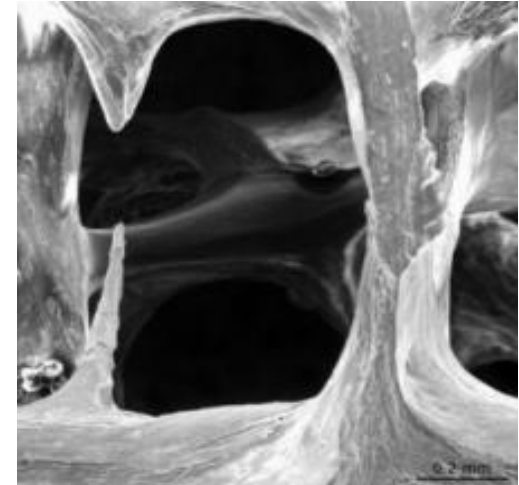
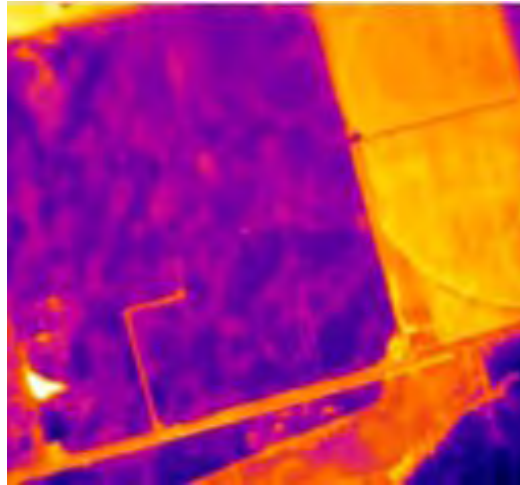
- Tax Increment Financing
- Industrial Development Bonds
- Federal Grants & Tax Incentives
- State Business and Tax Incentives
- Private Developer Debt & Equity Financing
- University Foundation

### Operations & Maintenance

- Federal Grants
- State, Local Government Sources
- University Foundation
- University F&A Income
- University Sources
- Industry Partnerships
- Philanthropy
- Lease Revenues
- Property Owners Dues & Assessments
- Equity Sources (License Fees & Royalties)
- Project and Program Income

### Commercialization & Centers of Innovation Funding

- Angel Funds
- Institutional Seed and Venture Capital Funds
- Federal Grants & Contracts
- Industry Partnerships
- State, Local Government Sources
- State Tax Incentives (NE Advantage)
- University Foundation
- University Sources
- Philanthropy
- Client Fees & Lease Revenues
- Equity Sources (License Fees & Royalties)
- Project and Program Income



*“The NIC's development will create a major asset, not only for UNL and the University System, but also for Lincoln and the entire State of Nebraska.”*

- Harvey Perlman, Chancellor UNL

## F. MARKETING PLAN

Effective branding and marketing of the NIC is critical to the long-term success of the enterprise. Competition for high technology development is fierce nationally and internationally. The NIC will need to differentiate itself from other research parks and university-based technology initiatives. Therefore, a marketing campaign is recommended with several dimensions:

- The research strengths and Centers of Excellence at the University – Food, Fuel and Water
- A sustainable environment that embraces the concept of live, learn, work and play
- State-of-the-art facilities, including interdisciplinary research centers, Innovation Center (incubation facility and program), hotel and conference center
- Innovative programs that link the University and the commercial sectors

The marketing program should be centered on a clearly articulated NIC vision and mission statement and should be consistent with the master land use plan, campus development guidelines and target specific audiences. These Include:

### **Research Park, Business Incubation Industry and Economic Development Organizations**

A key component of taking the NIC to national and international audiences is presentations before the key national and international organizations that comprise research parks and incubators. These include at a minimum:

- Association of University Research Parks (AURP)
- National Business Incubator Association (NBIA)
- International Economic Development Council (IEDC)
- International Science Park Association (IASP)
- Association of University Technology Managers (AUTM)
- Licensing Executives Society (LES)
- Society for College and University Planners (SCUP)
- University Economic Development Association (UEDA)
- Urban Land Institute.

### **Developers and Investors**

The regional, national, and international development markets should know about the NIC and its attributes and incentives. CoreNet is an excellent site broker network at a broad scale. The key message is translating the master land use plan into new opportunities for development and investment.

### **Prospective Local, National and International Tenants**

The attraction of companies to the NIC must be based on a marketing strategy that is defined by market analysis and targeted to key industry sectors that are tied to the University's research centers of excellence. This marketing plan should be clearly defined and will require a sustained effort to capture the attention of companies and build interest in the NIC.

### **University and Community**

A key goal of the communication and marketing plan is to define the benefits of the NIC to the University and the community. The first step is to inform, educate and engage these audiences so they can support the project. Outreach efforts should be broad with special emphasis on the Governor, the legislators, and key business leaders around the state. Ultimately, the communications plan will build the basic support to market the NIC to other key audiences.

## CLOSING COMMENT

This report contains the Business Development Strategies necessary to create a path to the effective, timely management of a process at the University of Nebraska – Lincoln for capturing the enormous potential of the NIC. Much work remains to be done, but the enabling actions needed and the phased development plan are clearly defined.

These Business Development Strategies, combined with the companion Master Plan, set out the work in a logical progression that can lead to the earliest possible success in allowing the NIC to become the contributor to a brighter future for the University, City of Lincoln, and all of Nebraska. Such outcomes will be the legacy of LB 1116 and the leaders who had the wisdom to enact it and achieve its vision.

*“The goal of UNL is to encourage and incent the greatest amount of private / public research and economic development on this property thus allowing this site to become a preferred location for significant job creation in Lincoln and the State of Nebraska. The expectation is that this development will also enhance the University’s research competitiveness and lead to additional commercialization of University research.”*

- drawn from original UNL NIC Proposal

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