Introduction

What does it mean to be an engaged university in a world-class, global region?

That is the challenge facing Northern Illinois University, a student-centered research institution serving an extraordinarily diverse region of urban, suburban and rural communities from a main campus 65 miles west of Chicago. NIU’s service region comprises the top quarter of the state and contains about 80 percent of Illinois’ population and 90 percent of its industry and business. Chicago is one of the world’s major culture centers and a genuinely global city by almost any measure. Indeed, Chicago has been recognized as one of the top ten economic centers worldwide by Standard & Poor’s. The Chicago Metropolitan Statistical Area (MSA) includes a population of more than 10 million, and is now the third most populous area in the United States. Rankings of global cities typically put Chicago near the top, in the company of New York City, London, Paris, and Tokyo.

NIU’s service area, however, covers the whole of northern Illinois, not just the metropolitan and suburban east end. Within a 45-minute drive of NIU’s main campus in DeKalb, for example, are three mid-sized river towns (Rockford, Aurora and Elgin), struggling to recreate prosperity from the ruins of a manufacturing-base collapse. Moving further west towards the Mississippi, the landscape changes again. This territory is dotted with very poor communities, old towns with declining populations and high concentrations of elderly people who grew up there and probably will never leave. With greatly reduced earnings from manufacturing centers and very little high-paying employment, these communities struggle with an associated inability to retain working-age residents and a parallel inability to support high-quality public school systems for the children of those who remain.

This, then, is the region with which NIU strives to be engaged and in which it promotes innovation and economic prosperity. Three case studies illustrate very different approaches to NIU’s regional engagement agenda: The first describes efforts to spread broadband connectivity throughout the region; the second illustrates how an engaged institution can coordinate and create excitement about school-university partnerships from pre-school through graduate school; and the third describes an initiative that focuses many NIU resources on a single, high-need community.

Highlights of three case studies

According to a 2012 survey of 7,253 Illinois businesses, 75 percent say broadband infrastructure is essential to remaining in their current location, while more than half say the availability of
high-speed Internet is a key factor in deciding where to locate a new business. These findings came as no surprise to NIU technology experts, who have spent the last decade creating broadband networks across the northern Illinois region and throughout the state. By the end of 2013, NIU will have strategically planned and assisted in the build-out of more than 2,200 miles of fiber optics in Illinois, connecting more than 750 community anchor institutions – schools, hospitals, municipal governments, public safety departments, libraries and museums – to super-high-speed networks. Along the way, the university has acquired nearly $120 million in state and federal broadband deployment grants, as well as dozens of public- and private-sector partners.

When NIU’s Center for P-20 Engagement received formal center designation from the Illinois Board of Higher Education earlier this year, one board member exclaimed, “This is wonderful – all universities should be doing this!” The object of his enthusiasm is a ten-year NIU effort to coordinate all university activities aimed at improving education from pre-school through graduate school. The P-20 Center connects external partners such as schools, government agencies and community colleges with people and resources across five colleges and more than 20 offices, centers and institutes at NIU. Among more than 30 university-wide activities currently managed by the Center, this application highlights STEM Outreach as the initiative offering the broadest range of examples of innovation growing out of multi-disciplinary collaboration.

The third case study presented here focuses on NIU’s engagement efforts in one community hard-hit by economic downturn. Like many mid-sized urban centers across the country, Rockford, Illinois faces the dual hardships of high unemployment and low educational attainment. This former manufacturing giant routinely posts the state’s highest jobless rates, while its percentage of college-bound students is among the lowest in the Midwest. Yet this diverse community of 150,000 has many assets as well, including leaders willing to partner with NIU to develop new clusters of economic activity. One such initiative involves NIU’s successful partnership with Rockford to develop an aerospace cluster based less on manufacturing and more on design and testing. This initiative has attracted considerable attention from both federal agencies and private business: Last year Rockford landed a $2.4 million grant to support aerospace job development, while a leading aerospace company cited the NIU-led initiative as a deciding factor in its decision to make a $385 million expansion investment in the Rockford area.

**NIU’s definitions of innovation and economic prosperity**

In all three case studies, and guiding all of NIU’s engagement efforts, is a commitment to fostering innovation. This is accomplished by continually creating new products, partnerships and processes that bring value to the region. The broadband initiative, for example, made new use of existing partnerships. Beyond that, much of the network already existed in the form of unused “black fiber” laid years ago along area highways. Innovative thinking made new use of existing resources (human and material) to create value for the region. Similarly, many of the initiatives undertaken by NIU’s P-20 Center have their roots in long-standing relationships with
area schools. Innovation occurred when the university created a central coordinating body for those efforts (the Center), introducing a supportive infrastructure that multiplies individual efforts into more valuable outcomes. Thus innovation at NIU is both doing new things and doing old things in new ways, always with a focus on creating value.

The aforementioned case studies also illustrate NIU’s holistic approach to building the economic capacity of its region. Regional economic prosperity as pursued by Northern Illinois University is about health, happiness, and personal satisfaction made possible by meaningful employment, social/cultural affiliations, civic engagement, and financial security.

**Process Experience**

NIU is one of 29 APLU member institutions that helped develop the new CICEP metrics template. University leaders recruited several different groups of external stakeholders to help test different versions of the assessment tool. Testing results were shared with CICEP tool developers and helped shape the final product.

On April 18, 2012, the university held a half-day workshop with 20 regional business and community leaders. Three types of information were collected from workshop participants: their perspectives on NIU’s role in regional development; NIU’s relationships with industry and its workforce development role; and the usefulness of the new CICEP metrics. The priorities stakeholders identified were:

- Talent development
- Business support (shared technical facilities, help bringing innovation to market, and research)
- Convening and leading ongoing discussions about a regional vision
- Promoting awareness of the region

Inspired by stakeholder insights, NIU has added assessment components to all of its engagement activities. Advisory groups exist around every project to ensure that partnerships are going well and conflicts are resolved along the way. Across the entire spectrum of regional development initiatives, NIU is incorporating focus groups, surveys and other feedback mechanisms. NIU continues to use the CICEP tool to assess the quality of its relationships with external partners, and to learn how the university can strengthen those connections.

**Choosing accomplishments and challenges to highlight**

In choosing subjects for the three case studies, NIU leaders picked those that have made the most progress over the last five to ten years. Broadband, P-20, and Rockford Engagement are all long-term projects with substantial successes and exciting challenges. Their corollaries on the growth and improvement side have in common the theme of sustainability: How shall NIU maintain the momentum that has fed these initiatives? What are their logical next steps? And most important, who will champion these projects going forward? This document suggests that
sustainable progress on these and other regional engagement projects depends on developing a more entrepreneurial culture among NIU students and faculty. It also suggests that the university’s regional centers can better support entrepreneurial activities by becoming vibrant hubs of engagement in their communities.

The Economic Engagement Enterprise

Beyond the traditional roles of employer, purchaser, and workforce developer (in which NIU contributes millions of dollars to regional economies), the university is purposefully and intentionally engaged in a wide range of economic development activities. Those initiatives range from efforts to teach and encourage entrepreneurship to programs focused on manufacturing innovation.

While NIU’s economic engagement mission is acted upon by divisions, departments and colleges across campus, two entities perform primary coordinating roles: The Division of Outreach, Engagement and Information Technologies (OEIT) and the Division of Research and Graduate Studies (DRGS). Both divisions utilize project-specific advisory boards comprised of both internal and external stakeholders. Examples include the Broadband Advisory Council; the P-20 Advisory Committee; the Outreach Advisory Committee; the Northern Illinois Research Foundation; and the Regional Opportunities Coalition in Rockford.

To demonstrate the institution’s recognition of the critical role of engagement, NIU has established a faculty award program that emphasizes the engagement principles of reciprocity and mutual benefit. The Presidential Engagement Professorships carry the same level of prestige and financial reward as those for teaching and research, and serve to illustrate the best practices laid out by the Kellogg Commission and Carnegie Foundation.

The Division of Outreach, Engagement and Information Technologies takes as its responsibility the ongoing education of NIU’s campus community regarding engagement. One such effort of note is the online database ENGAGE! designed to capture, categorize and share a wide range of faculty, student and staff engagement projects. ENGAGE! remains a work in progress, but continues to gain traction among faculty as a repository for documenting their work, and by external partners as a source of information about faculty, staff, and student expertise and research and engagement interests.

Economic Engagement Planning

NIU has worked diligently with internal and external stakeholders to develop a common vision for university-industry partnerships, and a mutual understanding of the university’s role in workforce and economic development. These efforts have greatly informed NIU’s academic and institutional strategic plans (the Great Journeys Strategic Plan and the Vision 2020 Strategic Plan). Both plans reflect input from alumni, trustees, faculty, staff, students, and external partners. An external stakeholder workshop hosted by NIU sought feedback on metrics and methods for assessing university contributions to innovation and economic engagement.
Two common themes have emerged in countless conversations with external partners: First, NIU must do more to encourage entrepreneurship among all members of the university community; and second, that NIU’s regional centers in Rockford, Naperville, Hoffman Estates and Oregon (as well as the NIU-managed University Center of Lake County) can and should play stronger roles in the university’s overall economic engagement efforts. More details may be found in the Growth and Improvement sections of this document.

Given the inextricable link between NIU’s future and that of its region, the university’s strategic plans (and the stated intentions of its new president, Dr. Douglas Baker) focus heavily on expansion of external partnerships and opportunities for engaged learning. To those ends, the Division of Outreach, Engagement and Information Technologies is strengthening its partnership with the Office of Student Engagement and Experiential Learning (OSEEL), the Graduate School, and the college offices to provide opportunities for undergraduate and graduate students to work with external partners.

**Promotion and Communication**

Keeping internal and external stakeholders informed and inspired about economic engagement activities is a challenge that is readily accepted by NIU leaders. From the president and Board of Trustees on down, NIU takes advantage of every opportunity to reinforce this critical aspect of the university’s mission. Audiences with whom the university routinely communicates about economic engagement include elected and appointed officials; leaders of business and industry; teachers, school officials and parents; leaders of NGOs and civic organizations; chambers of commerce and economic development groups; and internal audiences.

NIU utilizes all forms of communications in its efforts to tell the economic engagement story: newsletters, blogs, social media, story placements in the popular press, printed materials, websites, broadcast media, etc. Ongoing survey activities also remind stakeholders that the university is actively engaged in economic development activities and interested in external ideas and opinions.

**Advancing University Economic Engagement**

Within his first few days on the job, new NIU President Doug Baker met with regional stakeholders and reaffirmed his and the university’s commitment to be an active player in the economic life of the region. With a stated focus on “the career success of our graduates,” President Baker underscored the importance of university-industry partnerships and the need to build an entrepreneurial culture within the university and throughout the region. To that end, President Baker is infusing external perspectives into all university planning, including that undertaken by the Board of Trustees.

Leadership in the area of metrics and assessment continues to come from the outreach and research divisions. OEIT and DRGS participated extensively in development and testing of the
CICEP Institutional Assessment Tool and in construction of the IPEA award process, and represent NIU on CICEP, CEO and CRPGE.

Finally, while several best practices have been identified in this award application, the overarching theme that pervades all descriptions of successful NIU engagement projects is a focus on relationships. Identifying, developing and nurturing partnerships in a context of mutual respect and shared goals is NIU’s single most important engagement strategy.
Case Study #1: Broadband

High-speed connectivity has become an essential ingredient for the success of nearly all of today’s business, non-profit, government and healthcare initiatives. Armed with nearly $150 million in state and federal grants, Northern Illinois University is setting the stage for greater regional economic growth through enhanced connectivity.

For nearly a decade, NIU has led efforts to expand broadband access in the Chicago region and beyond. By the end of this year, NIU will have strategically planned and assisted in the build out of more than 2,200 miles of fiber optics in Illinois, connecting more than 750 community anchor institutions – schools, hospitals, municipal governments, public safety departments, libraries and museums – to super-high-speed networks.

What began in the early 2000s as a way to connect NIU’s main campus to branch facilities in the suburbs quickly grew into an innovative regional engagement commitment. The presence of the university’s Information Technology Services unit within NIU’s outreach division set the stage for this initiative, and has maintained its priority status for almost a decade.

Northern’s broadband initiative began in 2004 with NIUNet – a roughly 175-mile fiber optic loop throughout the western Chicago suburbs and greater northern Illinois region. NIUNet consists of both newly constructed segments and previously unused leased underground fiber. All along the network route, NIU formed partnerships with local governments, school districts, hospitals and other institutions to bring high-speed connection to their front doors through a shared cost model that saved millions of dollars for all concerned.

NIUNet’s success begat the next chapter in NIU’s broadband story: a 900-mile network spanning nine counties in the northwest part of the state known as the iFiber project. That initiative is connecting more than 500 community anchor institutions to high speed networks under a $68.5 million federal grant – the largest in NIU history. When completed, iFiber will increase Internet speeds by more than 1,000 times in a region looking for competitive advantages that can attract new business and industry to the largely rural area.

NIU is bringing high speed broadband to northern Illinois through more than half a dozen different networks.
In DeKalb, the host community for NIU’s main campus, another $15 million investment from local, state and national agencies is helping both public agencies and private businesses take full advantage of high speed Internet connections. The DATA network will allow schools, libraries, public safety organizations, hospitals and others to recognize 1,000% increases in speed and to share technical resources, video and educational services – all while reducing costs. The new lines installed under this program also will provide a backbone infrastructure for the new county-wide e-911 service, and will enhance Internet capacity for libraries, where heavy use often slows computer speed to a crawl.

Enhanced emergency care, remote diagnostics and better access to medical specialists will soon be available at rural hospitals and clinics throughout Illinois, thanks to an innovative, NIU-led partnership known as the Illinois Rural Health Network (IRHN). Funded by a $21 million federal grant, IRHN is connecting 88 locations across the state to a lightning-fast broadband network. That enhanced speed means health providers in rural areas can consult with specialists, monitor patients in remote locations, transmit and receive very large files such as MRI scans – all in a matter of minutes or seconds. In many part of Illinois, patients have no local access to specialists in critical fields such as radiology, cardiology, and neurology. IRHN will enable participating hospitals to dramatically expand the menu of medical services they can offer, and will significantly improve emergency care at hospitals in remote parts of the state. Without access to a broadband network, for example, a typical CT scan would take five days to transmit, versus just minutes with a high-speed connection.

Not content to simply expand broadband access, NIU has recently moved into a second stage of digital evangelism: teaching partners how to realize the full promise of high-speed Internet. One such initiative involves helping 1,300 primary care physicians across the state learn how to make the best possible use of electronic health records. With more than $9 million in federal funding, the project presents webinars and case studies for doctors, as well as health informatics training for staff. As fiber optic cable installation projects wind down, NIU’s focus with all partners is shifting to development of applications that makes full use of broadband’s potential.

For its community college partners, NIU’s broadband initiative delivers an extreme clarity of sound, crispness of image and complete lack of lag time in delivery of information – all of which makes distance education more like an in-person classroom experience. NIU’s School of Music uses the network to give its students access to performances by world-class musicians, in real time. Students and teachers hear and see each other as if they were in the same room, permitting meaningful interaction with guest professors across the country and around the globe. At the K-12 level, expanded bandwidth means districts that cannot afford full-fledged fine arts programming can expose students to music, dance and visual arts via distance education. The promise of high-bandwidth networks extends as well to science and the humanities: In one school students are able to look through telescopes in Hawaii and through microscopes exploring the world at the nano level, all thanks to their school’s connection to a
high-speed broadband network. And as if that were not enough, the schools are recognizing a 75% reduction in Internet costs by being part of these NIU-led networks.

NIU’s broadband initiatives help the university realize many of its engagement goals, not the least of which is regional economic development. High-speed fiber-optic networks open up a world of possibilities for communities by making them much more attractive to companies that do business around the world. For small, rural communities (which comprise a majority of Illinois towns outside the Chicagoland area), access to high-speed fiber-optic networks helps level the economic development playing field with urban centers. The broadband initiative has brought millions of dollars in investment to the region, creating jobs and enhancing the region’s global competitiveness.

**Case Study #2: Center for P-20 Engagement**

Northern Illinois University’s Center for P-20 Engagement (P-20 Center) is unique in its focus on coordinated campus-wide efforts to connect external partners such as schools with people and resources across five colleges and more than twenty offices, centers, and institutes at NIU. Such coordination may seem like an obvious strategy, but the P-20 initiatives at NIU represented a new way of thinking about the typical organizational problem of the left hand not knowing what the right hand is doing. In the past, individual faculty members arranged projects with teachers in area schools. In schools with large, high-needs populations, NIU sometimes conducted three or more projects simultaneously in one building, quite unaware of each other. This scattershot approach caused frustration among school administrators, a sense of exploitation among teachers, and roadblocks for faculty seeking partners.

In meetings and surveys, internal and external education stakeholders indicated that the university needed to focus on mutually agreed issues and to follow through over the long-term. In response, NIU launched initiatives expected to reduce fragmentation and maximize the impact of off-campus P-20 activities by faculty, students, and staff. The unexpected consequences include innovative programs and products that expand the workforce pipeline in critical areas such as STEM as well as enhance the educational, social, and cultural vitality of the region. By integrating economic engagement data developed by the Center for Governmental Studies and Regional Engagement/Rockford, the P-20 Center connects faculty, staff, and students to regional priorities for workforce development.

Among more than 30 university-wide activities now managed by the P-20 Center, STEM Outreach offers many examples of high-impact collaboration with external partners. The mission of STEM Outreach is to increase STEM literacy and enthusiasm through on-campus and off-campus activities for learners of all ages. Campus involvement stretches across more than 20 departments. The STEM Outreach Advisory
Board includes faculty champions from 5 colleges. STEM Outreach organizes quarterly meetings of NIU STEM students including 15 groups from 3 NIU colleges. These groups have developed engaged learning projects and inspired ongoing student participation in STEM Outreach’s extensive menu of science, technology, engineering, and mathematics activities.

**School-based activities that build human capital for STEM careers delivered by NIU staff and students**

- Nearly 100 high-impact presentations at K-12 schools target STEM concepts identified by schools.
- Family STEM nights feature dozens of hands-on experiments and build parental support for local STEM programs.
- After-school clubs, **Saturday sessions**, and **summer camps** help learners explore STEM careers and expand their STEM knowledge and skills.
- Workshops for more than 400 teachers on STEM problem-based learning and Next Generation Science Standards improve teaching in subjects requested by school districts.
- Support for development of STEM career academies links high schools’ needs with NIU’s areas of strength identified by the P-20 Task Force.

**Regional activities delivered by multi-disciplinary groups of NIU faculty and students**

- **STEMfest** provides hundreds of hands-on activities for 5,000 learners; nearly 600 NIU students and faculty assist by explaining STEM phenomena.
- **STEM Teen Read** inspires readers to learn about STEM concepts in selected science fiction books; includes face-to-face and online discussions, interactive web games, collaborative writing projects, and author visits; departments in five colleges, high schools, local libraries, and publishers collaborate.
- An online lab school now in development allows NIU teacher candidates to learn to teach in online environments and offers STEAM (STEM plus arts) learning opportunities designed with regional schools.
- Three video games were created by multi-disciplinary teams from six departments in three colleges. **Picodroid** helps students learn the periodic table. **Bunnies in Space** teaches vocabulary to struggling readers. **Falling Ash** requires mastery of science concepts to survive a volcanic disaster.

Pati Sievert, Coordinator of NIU’s STEM Outreach, and assistant Jeremy Benson deliver an engaging presentation about STEM topics to a group of elementary school students.
• **STEM Cafés** enable participants to discuss hot STEM topics with university experts and STEM professionals at local restaurants. More than 1000 community members attended STEM Cafés in 2012-13.

• **Bright Futures** brings families to NIU and four local libraries for hands-on activities, books, and kits that teach electricity concepts, and creates electronic art pieces for display at the libraries.

• **Green Lens Film Festival** sponsored environmentally-conscious activities for children and adults, involving faculty from three colleges, numerous “green” local businesses, and international activists.

• Support for STEM career academies in 12 area high schools directly connects NIU and teens to workplace experiences.

**By the Numbers**

The P-20 Center measures the impact of its programs and partnerships such as STEM Outreach by tracking numbers of people involved; participants’ evaluations; regional stakeholder surveys; and annual reports that include milestones, outcomes, and benchmarks and are analyzed through rigorous, university-wide strategic planning processes.

In 2012-2013, the P-20 Center activities engaged 1,372 NIU students; 280 NIU faculty; 2,763 P-12 teachers; 46,714 P-12 students; and 11,800 community members.

At STEMfest, 90% of adults said they will encourage their children toward STEM studies; 74% of children said they hoped to work in a STEM field.

In response to a 2013 survey based on CICEP’s Institution Assessment, 90% of community partners valued the P-20 Center’s convening of regional partners. However, 55% indicated that better reporting of impact would stimulate further cooperation.

Programs such as STEM Outreach flourish in the P-20 Center, a neutral location. Departmental and college priorities and funding might have cramped STEM Outreach if it were located in a single college. Instead, faculty, staff, and students from all colleges voluntarily collaborate in P-20 activities. The P-20 Center reports jointly to the Provost’s Office and the Division of Outreach, Engagement, and Information Technologies. Deans from five colleges act as advisors and convey to faculty their commitment to P-20 coordination, cooperation, and collaboration. In 2013, the Illinois Board of Higher Education granted permanent status to the P-20 Center,
signaling full institutionalization of coherent, university-wide efforts to address education-related problems jointly with local partners.

Case Study #3: Supporting the Aerospace Cluster in Rockford, Illinois

May 23, 2012: Rockford area business, government, education and economic development leaders gather around a Declaration of Commitment to the Joint Institute for Engineering and Technology - Aerospace, a community-based initiative to enhance the region’s aerospace talent.

Like many mid-sized urban centers across the country, Rockford, Illinois faces numerous challenges. High unemployment, low educational attainment and a lackluster economy have placed the Rockford area in an increasingly vulnerable position over the past two decades. Despite these negative indicators, the region has many assets on which to build a path to a better future. At the top of this list of assets is a strong aerospace cluster, the nation’s ninth largest in terms of employment.

Northern Illinois University’s Office of Regional Engagement in Rockford works in partnership with regional business, government and nonprofit leaders in pursuit of an aggressive set of strategic goals for the region. Recognizing the importance of the aerospace industry as a major economic driver, NIU and the Rockford Area Economic Development Council convened a group of stakeholders to discuss how to ensure the robustness and resilience of this sector of the regional economy.

Soon after, the Rockford Area Aerospace Accelerator Project (RAAAP) was created to accelerate innovation, job creation and global competitiveness in the aerospace cluster. In collaboration with regional aerospace industry leaders, a coalition of higher education, economic development and workforce development professionals developed a regional aerospace growth system focusing on four key goals: workforce development, product innovation, branding, and high-tech entrepreneurship. In 2011, the group was awarded one of 20 federal Jobs and Innovation Accelerator Challenge (JIAC) grants to support its efforts.
The project is led by Northern Illinois University with the Rockford Area Economic Development Council, Rock Valley [Community] College, EIGERlab (small business incubator/accelerator), and the regional Workforce Investment Board. Private sector members of the Rockford Area Aerospace Network (RAAN) are actively engaged in the project, providing valuable input, helping to facilitate linkages with regional companies and providing critical support of key project elements.

**Goal 1: Building the Engineering and High-Tech Workforce Pipeline.**

Recruitment and retention of engineering talent are top concerns in the aerospace industry. In conversations with human resources professionals at regional aerospace companies, the project team recognized the critical need to align educational and industrial assets to help the region effectively “grow its own” engineering and high-tech talent.

The partners’ commitment to growing the region’s own aerospace workforce led to the creation of a unique academic program. The Joint Institute for Engineering and Technology – Aerospace (JiET-A) is an innovative partnership among aerospace businesses, higher education institutions and students. Area higher education institutions put aside competitive issues and jointly market academic programs that prepare area students for aerospace careers. As JiET-A participants, students are counseled and mentored by both education and aerospace professionals as they move along their selected aerospace career pathways. Regional aerospace companies are offering paid internships that are integrated with students’ academic curriculum. When the JiET-A students graduate, they will enter the aerospace industry with valuable skills and experience. The aerospace companies benefit by hiring new young talent with demonstrated capability and established roots in the community.

In its first year of operation, JiET-A established 20 internships with nearly 100 students vying for the opportunities. The project team, with the help of a loaned executive from United Technologies Aerospace Systems, is working with regional companies to expand the number of internships to meet the growing demand.

**Goal 2: Product Innovation for the Aerospace Supply Chain.**

Many of the Rockford area small and medium enterprises (SMEs) traditionally have been “build to print” shops, with no in-house engineering capabilities. The NIU College of Engineering and Engineering Technology provides Engineer in Residence (EIR) services to these companies, placing faculty-supervised engineering students on-site to serve as research, development, test, and evaluation engineers. Product innovation is also supported by the EIGERlab through use of
its 3D additive manufacturing equipment for prototype fabrication and consultation with business and product development experts.

Outcomes to date include placement of five EIRs with regional aerospace companies. NIU engineering students under faculty supervision researched and developed solutions for projects, resulting in accelerated product advancement of high tech materials and control systems. Nine companies were assisted with prototype fabrication using EIGERlab’s 3D additive manufacturing equipment.

**Goal 3: Effective Branding of the Region as an Aerospace Cluster.**

The project team branded the Rockford region as Mid-America’s best mid-sized international region for aerospace and aviation companies. There is a sustained public relations campaign underway that has attracted significant national media placements in site selection and aerospace industry trade publications as well as major business news publications such as the Chicago Tribune and Crain’s Chicago Business.

In addition to national media coverage, Rockford’s aerospace cluster has been on the world stage through participation in globally recognized tradeshows. Nineteen area companies have participated in five national and international trade show delegations, returning with sales leads and orders. This activity has also developed a closer working relationship with the State of Illinois, with state economic development officials embracing the Rockford aerospace activity as a key strategic initiative.

**Goal 4: Supporting High-Tech Entrepreneurship.**

The EIGERlab licensed the Small Business Administration’s Growth Wheel business strategy tool and created peer-to-peer roundtable groups for the aerospace, advanced manufacturing and minority communities.

The Aerospace Accelerator Project has become a regional exemplar of collaboration and has generated meaningful economic outcomes for the region. In announcing its decision to make a $385 million expansion investment in the Rockford area in May 2013, leading aerospace company Woodward referenced the activities of the Accelerator Project and the creation and successful implementation of JiET-A as key factors in Rockford’s favor over other sites being considered for the expansion. The Rockford Area Economic Development Council estimates that this project will result in 1,600 new jobs and 1,750 retained jobs over the course of the next five years.
Growth and Improvement Plan

Identifying Areas for Growth and Improvement

NIU’s main campus is located in DeKalb, Illinois, at the western edge of the rapidly developing I-88 business corridor (see figure below). The area served by NIU includes sub-regions that range from rural to urban and from prosperous to economically distressed. NIU is committed to collaborating with partners from across this region to address social, educational and economic issues of mutual concern, and to develop shared expectations for university contributions to innovation and economic growth.

NIU manages six regional centers throughout northern Illinois. Each partial circle on the above map represents a 25-mile radius around each associated center.

External stakeholder groups routinely emphasize the essential role that NIU plays in talent development, and the need to encourage student and faculty innovation and entrepreneurship. They further recognize that almost 80% of Illinois’ economic activity is located within a short drive of NIU’s main campus in DeKalb or one of its regional centers in Oregon, Rockford, Naperville, and Hoffman Estates, and they consistently suggest that NIU can be doing more with these satellite facilities. Specifically, they suggest that NIU convene potential collaborators to brainstorm about regional vision, talent development, and entrepreneurial
activity, and to lead efforts to develop economic engagement goals and metrics for sub-regions of the university’s service area.

NIU has identified three areas where growth and improvement will further the university’s goals of creating an entrepreneurial culture and increasing regional engagement: 1) promoting student innovation and entrepreneurship; 2) encouraging faculty innovation and entrepreneurship; and 3) leveraging regional centers as vibrant hubs of engagement and education in their communities.

Members of NIU’s senior leadership have publicly embraced these goals. Former NIU President John Peters co-signed a letter sent to the Secretary of Commerce in 2011, wherein the university expressed its commitment to building a campus-wide innovation ecosystem capable of evolving to a regional or national network. NIU shared components of its plan for growing innovation and entrepreneurship through the AASCU Innovations Exchange. In addition, NIU has formally reached out to members of the Illinois Innovation Council for assistance in convening workshops focused on identifying common regional economic development goals, defining new opportunities for innovation and sustainable entrepreneurship, and developing meaningful metrics to measure success.

**Defining and Documenting Success: Student Innovation and Entrepreneurship**

NIU is promoting innovation and entrepreneurship among students in programs across campus, building on successful models from the business and engineering colleges:

- Entrepreneurship programs housed in Business and Engineering are reaching out to students from other disciplines to encourage them to pursue coursework and certificate programs focused on entrepreneurship skills.
- NIU is investing in new initiatives focused on expanding the opportunities for student entrepreneurship training.
- NIU is actively supporting pre-college education and outreach programs that create an "innovation and entrepreneurial mind set" among middle grade and high school students. University leaders believe the program will increase the number of NIU applicants and future students who possess an entrepreneurial mindset.

New programs are being developed in consultation with alumni, business and community leaders. These include business plan-and-pitch competitions, as well as leadership development programs that emphasize entrepreneurial skills:

- NIU sponsors social venture competitions to help students launch new businesses that address social problems.
- The NIU Foundation sponsors a Venture Grants program focused on advancing commercialization of faculty inventions. The program invites students and community members with expertise in communications, business, and law to collaborate with the inventors.
The metrics and benchmarks that will be used to define success in fostering student innovation and entrepreneurship are still under development and are being informed by the CICEP New Metrics initiative. Initially, student participation in programs that provide opportunities to innovate and act as entrepreneurs will be tracked. Early success will be indicated by an increase in the number of students engaged in these pursuits; an increase in the number of such programs offered at NIU; and an increase in the number of majors and colleges represented among the student participants and program administration. Over time, measures of success will focus more on the efficacy and long-term impact of entrepreneurship education on students and society.

The major barriers to implementation of this growth and improvement plan are the challenges of effective communications; cultivation of student interest; and development of incentives and rewards for interdisciplinary collaboration.

**Defining and Documenting Success: Faculty Innovation and Entrepreneurship**

NIU is committed to growing faculty research, encouraging faculty innovation and entrepreneurship, and supporting the university’s technology transfer function. Through the inclusive Vision 2020 planning process, NIU has established ambitious goals for increasing research expenditures, enhancing industry collaboration and improving technology transfer. The needs for strategic investment in research and innovation, as well as reform of practices that have discouraged entrepreneurship, are well-recognized across the university community. Progress is being made, despite the limited availability of new resources and the significant fiscal challenges facing Illinois public universities:

- NIU has increased its internal expenditures in support of research and technology development through internal seed funding programs such as: Research & Artistry Opportunity Grants, Vision 2020 Research Investment, NIU Foundation Venture Grants, and Great Journeys Instrumentation/Equipment Grants.
- The NIU Office of Sponsored Projects (OSP) has reorganized to better support the university’s goals of increasing research expenditures and strengthening university-industry partnerships. OSP created a position dedicated entirely to contracts and industrial relations.
- The NIU Technology Transfer Office (TTO) is intentionally shifting away from its transactional focus to emphasize relationship-building as a core function.
- The Northern Illinois Research Foundation (NIRF) is a university-related 501(c) (3) with the stated mission “to contribute to and advance the educational, research, public service and economic development mission of NIU.” The NIRF Board was reconstituted to incorporate an increased number of members from regional economic development agencies, industry associations and research partners.
- NIU has expanded its participation in regional and national networks focused on innovation, entrepreneurship and industry partnerships:
- The Illinois Manufacturing Excellence Center (IMEC) is a non-profit economic development organization, funded in part by the National Institute of Standards and Technology - Manufacturing Extension Partnership, the Illinois Department of Commerce and Economic Opportunity, and by fees for services paid by Illinois manufacturers. NIU is home to one of the eleven Illinois office locations. Together, IMEC and NIU are creating a competitive grants program that funds IMEC-NIU-Industry partnerships focused on manufacturing innovation and regional economic development.
- NIU has become an active member of the University Industry Demonstration Project (UIDP), participating in development of model agreements and sponsoring an online networking opportunity in conjunction with a regional meeting.
- NIU has become an affiliate of Chicago Innovation Mentors, an entrepreneurship boot camp that supports and trains university-based and local innovators through the use of mentor teams.

The metrics and benchmarks used to measure growth and improvement are compatible with the data routinely collected by the NIU OSP, and consistent with the recommendations of both Vision 2020 and the APLU metrics projects:

- Faculty research productivity is by measuring sponsored research activity, including: proposals submitted to competitive programs (units = # proposals submitted and $ value of proposals); total awards received via competitive grants and contracts (units = # awards; $ value of awards); competitive federal awards (units = # awards; $ value); state and local awards (units = # awards; $ value of awards); corporate and foundation awards (units = # awards initiated; $ value of awards); total research expenditures ($ value).
- Industry collaboration is assessed by tracking both the number and the dollar value of contracts, consortia and affiliation agreements that include an industry partner, as well as the dollar value of industry-sponsored R&D.
- Faculty innovation and entrepreneurship are measured by tracking the numbers of invention disclosures, patent applications, licenses/options, and start-up formation.

The major barriers to implementation of this growth and improvement plan are related to: the current fiscal climate (state and federal); the staffing and resource base of the TTO; and the expectations of internal and external stakeholders.

**Defining and Documenting Success: Leveraging Regional Centers**

The three NIU centers (Rockford, Hoffman Estates, and Naperville) and the University Center of Lake County (a multi-university partnership which NIU helps manage) are state-of-the-art facilities that offer multimedia learning environments for academic classes and professional programs and full-service daytime conferences. Scenic Lorado Taft Field Campus is both a
conference center and an outdoor education venue for elementary and secondary school children.

With online learning and virtual meetings extending the reach of many higher education institutions, NIU must rethink the value proposition associated with these bricks-and-mortar facilities. To this end, NIU’s improvement plan for its regional centers has three objectives:

- Maximize the use of the regional centers in delivering OEIT educational programming
- Develop the capacity of regional center staff to become primary points of contact for marketing and supporting OEIT educational programming.
- Use the regional centers to draw community-based strategic partners into new and ongoing projects. By working together, employers, economic and workforce development professionals, state and local governments, foundations, and education entities will able to define assets, evaluate existing infrastructure, and develop a comprehensive economic development strategy.

Under the enthusiastic support of NIU’s new president, the first step in addressing these objectives is developing a profile for each of the five centers to better understand the needs and opportunities of the communities they serve. OEIT staff have access to a variety of public and private data sets and are in the process of generating these profiles. Once these are completed, they will be used to engage stakeholders in each center’s service area to identify sub-regional development priorities and related educational programming needs. The CICEP New Metrics framework will be used as the basis for developing measureable outcomes for each sub-regional development plan to ensure accountability and transparency.

Resources, follow-through, and alignment are the three top barriers to success. Resources to conduct the center profiles and staff the engagement processes are needed. OEIT has committed to this in its strategic plan and will engage the entire institution in this process. Following through to ensure that each sub-regional development plan is being addressed will require a multi-year, institution-wide commitment by NIU, and President Baker must actively reinforce the long-term importance of this effort. Institutional alignment is needed to ensure that all of NIU’s colleges and units are communicating and sharing resources, and this will require increased coordination and strong internal partnerships - strategies that are already being supported by OEIT and will be ramped up to support this improvement plan.
<table>
<thead>
<tr>
<th>Growth/Improvement Goal</th>
<th>Related Objectives</th>
<th>Activities</th>
<th>Timeline</th>
<th>Resources</th>
<th>Indicator/Measure of Success</th>
</tr>
</thead>
</table>
| Goal 1: Promote student innovation and entrepreneurship | Objective 1.1: Increase student participation in programs that emphasize innovation and entrepreneurship skills (list below) | Continue ad-hoc/individual efforts to promote existing programs Develop and implement strategic communication plan | Fall 2013: Publicize programs through NIU Today, email blasts, social media, posters, classroom visits) Form new partnerships to lend expertise and resources to development and implementation of communications plan Convene working group on communications plan | Staff time and financial support from the NIU Divisions of: Academic Affairs; Student Affairs and Enrollment Management; Outreach, Engagement and Information Technology (OEIT); University Relations; University Advancement. | Metrics and benchmarks define success in fostering student innovation and entrepreneurship are under development. Initially, student innovation and entrepreneurship will be measured by tracking participation in academic programs and co-curricular activities where students have the opportunity to innovate, think, plan and act as entrepreneurs. Early success indicated by increase in number of students engaged in these pursuits; increase in number of majors and colleges represented among the student participants; successful submission of planned grant. Over a longer time frame, success will be demonstrated by increase in number of NIU

  | Academic Programs Major in Community Leadership and Civic Engagement with an emphasis in enterprise; Undergraduate Certificate Program in Social Entrepreneurship; Minor in Social Entrepreneurship; Minor in Business Innovation and Entrepreneurship; Graduate Certificate in Entrepreneurship Co-curricular Activities NIU Collegiate Entrepreneurs Collegiate Association of Unreasonable Social | | | | |


| Objective 1.2 | Apply for grant from National Collegiate Inventors and Innovators Alliance Course and Grants Program to develop new student learning community focused on innovation and entrepreneurship | May-Aug 2013- Engage potential partners, accumulate background materials, develop initial concept; Sept-Oct 2013- Prepare grant proposal; Nov 2013- Submit grant proposal by Nov 10, 2013 | Staff time from the NIU Offices of Student Engagement and Experiential Learning; Housing and Dining; Sponsored Projects; Technology Transfer |
| Objective 1.3 | Illinois Pathways: R&D Learning Exchange and Finance Learning Exchange | June 2012- Request for Sealed Proposal (RFSP) issued to identify lead entity for implementation of R&D STEM Learning Exchange; July 2012- NIU faculty and staff are significant contributors to | Faculty/Staff Time Race to the Top (RttP) |

Entrepreneurs

*FastPitch*

Experiential Learning Center

Engineers in Residence

Social venture competitions

Venture Grants

Longer-term measures of success will focus more on efficacy and long-term impact of entrepreneurship education
Illinois Science and Technology Institute


Jan 2013 - May 2014: OEIT staff play leadership role in development of Illinois Shared Learning Environment.

Educator Release will include: Beta versions of priority applications for STEM Programs of Study in RttT Districts and highest priority Other Educator Applications.

By May 2014, Educator Release will include: Beta versions of priority applications for STEM Programs of Study in RttT Districts and highest priority Other Educator Applications.

By May 2014, Learner Project will include: Secondary priority applications for STEM Programs of Study in RttT Districts and highest priority Other Learner Applications.

Applications critical for student participation in STEM programs of study in RttT districts.

Any Illinois district can participate in the Illinois Shared Learning Environment.
<table>
<thead>
<tr>
<th><strong>Goal 2</strong>: Encourage faculty innovation and entrepreneurship</th>
<th><strong>Objective 2.1</strong></th>
<th><strong>Fall 2013</strong></th>
<th><strong>Spring 2014</strong></th>
<th><strong>By Spring 2014</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthen infrastructure and increase resources to support innovation by faculty researchers, scholars and artists</td>
<td>Continue formative and summative evaluation of existing programs supporting faculty research, scholarship and artistry; develop strategies for sustaining and institutionalizing high-impact programs</td>
<td>Collect FY13 outcomes data per established evaluation protocols</td>
<td>Present data to NIU President and Provost as part of FY15 budget development process; achieve consensus around future funding of various initiatives.</td>
<td>outcomes assessment and evidence-based management will result in enhancement of effective, high impact programs and modification or discontinuation of ineffective, low impact programs.</td>
</tr>
<tr>
<td>Relevant Programs</td>
<td>Staff members from Division of Research &amp; Graduate Studies devote time to managing these initiatives. Funding derived from a combination of appropriated funds and recovered facilities and administrative (F&amp;A) costs.</td>
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<tr>
<td>Research &amp; Artistry Grants; Vision 2020 Investment; Core User Facilities; PI Academy; Research Methodology Services; A1 Review; Dedicated Contracts and Industrial Relations Coordinator in OSP</td>
<td></td>
<td></td>
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<td>Sponsored research activity used as indirect measure of innovation, by tracking (in terms of numbers and dollar value): proposals submitted; total awards; federal awards; state and local awards; corporate and foundation awards.</td>
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<td>Industry collaboration measured by tracking number and dollar value of contracts, consortia and affiliation agreements that include an industry partner; also dollar value of industry sponsored R&amp;D.</td>
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<td>Innovation assessed by counting number of invention disclosures and patent applications.</td>
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23
| **Objective 2.2** | **A)** Move Technology Transfer Office (TTO) from transactional to relationship-building focus, through:  
  a) targeted professional development, networking and continuing education opportunities for TTO staff;  
  b) internship program for undergraduate and/or graduate students interested in business development, marketing or communications;  
  c) engagement of external consultants with expertise in entrepreneurship and commercialization of university intellectual property (IP);  
  d) collaboration with NIU community members | **Fall 2013-**  
  a) Finalize professional development plans for TTO staff.  
  b) Post position description, interview, hire and train interns  
  c) Employ external consultants (IP attorneys, technology scouts) on as-needed basis.  
  d) Launch 2014 Venture Grants  

**Spring 2014-**  
  a) Continue to support TTO staff professional development.  
  b) Continue to mentor interns.  
  c) Continue to engage external collaborators as needed.  
  d) Conclude Venture Grants according to established time-line: kickoff event/team formation in Jan; team training in | **Consultants and NIRF Board Members**  
  recruited by NIU’s Trustees, President, VP for Research, Foundation (NIRF) Board, and Alumni Association.  
  Interns recruited from colleges.  
  Funding derived from recovered F&A costs and IP royalty payments.  

| **A)** Faculty entrepreneurship measured indirectly: number of proposals submitted to SBIR/STTR etc; the number of licenses/options executed; number of start-ups that result from faculty research; number of faculty who participate in entrepreneurship programs (ex: Chicago Innovation Mentors (CIM), NSF-ICORPS).  
Change in TTO culture assessed by: ratio of disclosures to patent filings; number of external partners engaged; observable focus on relationships and less focused over transactions; more selective in filing patents. | **B)** Three new members join NIRF board.  
NIRF activity increased; more efficient than similar transactions within university. |
<table>
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<tr>
<th>Time Period</th>
<th>Description</th>
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</table>
| Fall 2013- | B) Increase ability of NIRF to support discovery, development, and commercialization of NIU ideas:  
|            | a) fill three vacancies on NIRF board with experts on venture capital, economic development, and biotechnology;  
|            | b) expand use of NIRF for simplifying business processes, facilitating interactions between private sector and University |
|            | Feb-March; business plan due date, final pitch delivery and selection of winners in April. |
| Fall 2013- | a) Nominations for NIRF board sought in September, reviewed in October; new Board members invited to December meeting |
|            | b) Presidents of NIU and NIRF prioritize opportunities for NIRF to NIU advance research, technology commercialization and regional engagement staff/units develop action plans for new business practices and partnership structures |
| Spring 2014- | b) Begin implementation of new business practices and |
|            | |

**Feb-March**

- Business plan due date
- Final pitch delivery
- Selection of winners in April

**Fall 2013**

- Nominations for NIRF board sought in September
- Reviewed in October
- New Board members invited to December meeting

- Presidents of NIU and NIRF prioritize opportunities for NIRF to NIU advance research, technology commercialization and regional engagement
- Staff/units develop action plans for new business practices and partnership structures

**Spring 2014**

- Begin implementation of new business practices and
<table>
<thead>
<tr>
<th>Objective 2.3</th>
<th>NIU becomes more visible in membership organizations such as Illinois Manufacturing Excellence Center (IMEC); the University Industry Demonstration Project (UIDP); Chicago Innovation Mentors (CIM)</th>
<th>Fall 2013 - NIU faculty from College of Engineering and Engineering Technology provide professional development program at IMEC board meeting; NIU VP for Research accepts chair of IMEC University Committee At UIDP September meeting in Moline, IL, NIU moderates networking through groupsPLUS and partnering360. NIU has become a CIM affiliate. Through this association, NIU is will nominate two inventor teams for mentoring.</th>
<th>Staff time from Division of Research &amp; Graduate Studies; membership fees funded by recovered F&amp;A costs.</th>
<th>Scheduled NIU events increase profile of university. IMEC and NIU develop jointly funded grants for NIU faculty to pursue partnerships related to manufacturing innovation. Faculty teams participating in CIM move inventions closer to commercialization.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 3: Leverage NIU’s regional centers as vibrant hubs of engagement and education in their communities</td>
<td>Objective 3.1: Prepare “footprint analyses” for each outreach center that describe the assets and opportunities in each market a. Use the resources of NIU’s Center for Governmental Studies to draft the analyses. b. Involve center staff in reviewing and enriching each analysis c. Present results and engagement plan to NIU senior leadership a. August 30, 2013 b. September 13, 2013 c. September 30, 2013</td>
<td>CGS and Center staff</td>
<td>Five analyses will have been prepared, vetted, and presented to NIU senior leadership.</td>
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<tr>
<td>Objective 3.2:</td>
<td>a. Distill analyses into</td>
<td>a. October 15, 2013</td>
<td>a. Outreach staff</td>
<td>Data- and stakeholder-</td>
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<tr>
<td>Use the analyses to engage each center’s stakeholders in identifying a shared vision and strategic priorities</td>
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<td>a. discussion materials</td>
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<td>b. Identify internal stakeholders to participate in engagement conversations</td>
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<td>c. Compile contact list of regional stakeholders</td>
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<td>d. Identify location(s) and dates for events</td>
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<tr>
<td>e. Conduct visioning sessions</td>
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<td>f. Prepare summaries</td>
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<td>g. Disseminate summaries to stakeholders for feedback</td>
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<tr>
<td>h. Finalize documents as for presentation to NIU leadership; include summaries of engagement opportunities across NIU’s entire region by department/college</td>
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<td>time to develop materials, engage internal and external stakeholders</td>
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<tr>
<td>b. Time of other NIU staff who will participate in visioning sessions</td>
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<td>c. Cost of facilities and refreshments</td>
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<thead>
<tr>
<th>Objective 3.3: Integrate the strategic priorities into university planning and resource allocation.</th>
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</thead>
<tbody>
<tr>
<td>a. Clarify institutional commitment in a written communication</td>
</tr>
<tr>
<td>b. Outreach staff meet with NIU units/colleges to present sub-regional plans and identify engagement opportunities</td>
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<tr>
<td>c. Notes from meetings developed and final</td>
</tr>
<tr>
<td>a. January 30, 2014</td>
</tr>
<tr>
<td>b. February 28, 2014</td>
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<tr>
<td>c. March 15, 2014</td>
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<tr>
<td>d. June 30, 2014</td>
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<tr>
<td>Staff time</td>
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<tr>
<td>Sub-regional strategic priorities have been integrated into NIU budgets and plans, as resources allow.</td>
</tr>
</tbody>
</table>
|   | summary presented to President Baker  
d. Results of internal discussions are translated, as feasible, into NIU budget and resource planning |   |   |