To Green and Beyond: Excellence Through Sustainability at UIC
Executive Summary
Over the last several decades there has been a preponderance of evidence that our way of life is not sustainable. In recent years it has become apparent that preservation of the natural environment upon which life depends will require profound changes in human behavior. The changes go far beyond individual efforts such as recycling, biking to work or school, energy conservation, or eating locally grown food, although these are important elements of sustainable systems. To fully confront the magnitude of what is required to create a sustainable society presents both opportunities and challenges and calls upon institutions of higher education to expand educational goals and outcomes, advance new research programs, and adopt policies that integrate principles of the sustainability paradigm.

The overarching goal of the proposed investment in sustainability at UIC is to advance the frontier of knowledge about attitudes towards, and the practice of sustainability among all campus members through education, research, and leadership. Practices should reflect current best evidence for strategies to sustain human health, environmental quality, economic productivity, infrastructure quality, energy accessibility, and social systems that will enable intergenerational well-being. The development and implementation of a plan to advance sustainability efforts should be infused with a level of urgency and sense of commitment that is commensurate with the global threat posed by climate change, resource depletion, and the failure of our educational system to prepare members of our society to comprehend and confront these challenges. As an urban serving research university with an exceptionally diverse population in the heart of a great American city, UIC is well positioned to lead by example.
Such leadership will require that UIC develop a strategic approach to integrating and applying sustainability principles and practices across its educational mission, the research enterprise, and the campus’s operations. Sustainability will become part of UIC’s brand, not only generating new opportunities, but also attracting students who are committed to its principles. The sustainability initiative should permeate the university’s strategic planning activities. Initial steps will include creating thorough inventories of current campus course and co-curricular offerings, research activities, and resource consumption practices. The following goals and strategies can then be translated into specific recommendations based on identified gaps and opportunities. They are organized around teaching and learning, research, and practice.

1. Teaching and Learning: Sustainability concepts, themes, and foundational knowledge will be integrated into the undergraduate curriculum and experience so that UIC students graduate with identified competencies essential to adopt the goals of sustainability. Opportunities for education in sustainability topics will be available to all campus members. Strategies may include:

   a. developing recommended competencies and facilitating the integration of sustainability topics across college educational programs;
   b. providing support to establish a sustainability minor, then a major, as well as non-degree for-credit and not-for-credit certificates;
   c. increasing the number of sustainability-related courses that qualify for General Education credit;
   d. establishing co-curricular programs that educate students, faculty, and staff about sustainability;
   e. supporting sustainability-related initiatives that provide experiential learning, build student leadership, and enhance community engagement opportunities.
   f. preparing students for additional study and employment in sustainability-related fields;
   g. creating learning opportunities for external students and the broader community, including non-credit and online courses.

2. Research: The campus will facilitate research that furthers specific sustainability goals, including disciplinary, interdisciplinary, collaborative, and translational projects. Strategies to support such research may include:

   a. identifying and implementing a process for tracking and capitalizing on funding opportunities in sustainability-related research topics;
   b. recruiting faculty in areas where there are gaps in expertise resulting in missed opportunities to engage in foundational research and respond to national priorities;
   c. providing seed funds to facilitate collaborative partnerships across disciplines to secure extramural funds for large complex projects;
   d. providing seed funds for community-based participatory research and citizen science to help neighboring communities address issues of sustainability, particularly as they relate to public health;
e. facilitating off-campus research partnerships, including with industry, to innovate on projects designed to improve efficiencies in energy and resource usage consistent with sustainability goals.

3. Practice: The campus will develop a comprehensive campus plan that identifies opportunities to conserve energy and resources, reduce waste and carbon emissions, formulate best practices, and rank the proposed actions by impact. Based on this plan, the UIC community will increasingly, progressively, and measurably adopt established sustainability standards and best practices, at both the individual and institutional levels. Administrative decisions in areas such as waste management, transportation, water and energy use, heating, and campus planning will more consistently include consideration of their implications for environmental, infrastructure, energy, economic, and social sustainability through the use of methods such as life-cycle analysis. Operational strategies may include:

a. establishing a central sustainable energy management function informed by faculty and staff with expertise to plan, guide, and monitor all energy usage and projects related to campus operations, including power plant operations, building operations, on-site renewable energy, and green power purchases, with specific metrics tied to targeted reductions in greenhouse gases and energy and a mechanism to reinvest energy savings in future energy efficiency projects;

b. requiring that new buildings on campus meet specific energy efficiency standards that communicate their real-time energy use to students, faculty, and visitors;

c. predictably and measurably reducing building energy use by a specified margin over the average of all other buildings on campus by, for example, retrofitting current heating and cooling systems to use geothermal resources;

d. increasing alternative transportation options by improving bike and walking paths, incentivizing use of public transit, and improving shuttle interconnectivity;

e. increasing student, faculty, and staff access to sustainable services and resources such as affordable housing, healthy food, and recreation;

f. reducing waste and increasing environmentally responsible practices for waste disposal in research and clinical settings, based on identified best practices;

g. identifying strategies to increase the efficient use of campus facilities and infrastructure, such as weekend and evening classes that take advantage of empty classrooms.
I. Introduction
"[O]ne of the distinguishing values of [research universities] is their willingness to take on an issue of importance simply because it is the right thing to do. Sustainability is such an issue."¹

"The issue is not the ability of higher education to take on this challenge; it is the will and the time frame for doing so."²

It has become apparent in recent years that to preserve the natural environment upon which life depends, we will need to change our behavior in ways that are profound. What is the scope of the problem we face? The changes required go far beyond individual efforts such as recycling, biking to work or school, or eating locally grown food, although these are all significant. For instance, global carbon emissions continue to rise annually. To limit global warming to just 2 degrees, the United States—the second largest carbon emitter—would need to reduce 2000 emission levels by 80% by 2050³—and the resulting temperature rise could still bring about significant social and economic upheaval.⁴,⁵

To fully confront the magnitude of what is required and to coalesce around meeting the challenge is both an enormous opportunity and a complex problem, yet it remains on the fringes of American higher education.
The overarching goal of the proposed investment in sustainability at UIC is to advance the frontier of knowledge about, attitudes toward, and practice of sustainability among all campus members through education, research, and leadership. These activities should reflect current best evidence for strategies and innovation to sustain the environment, economic productivity, infrastructure quality, energy accessibility and social systems to enable intergenerational well-being. The development and implementation of a plan to advance sustainability efforts should be infused with a level of urgency and sense of commitment that is commensurate with the global threat posed by climate change, resource depletion, and the failure of our educational system to prepare members of our society to comprehend and confront these challenges. As an urban serving university with an exceptionally diverse population in the heart of a great American city, UIC is well positioned to lead by example.

UIC’s mission statement, ratified in 2006 by the UIC Faculty Senate, is our starting point for considering how the campus will lead:

- To create knowledge that transforms our views of the world and, through sharing and application, transforms the world.
- To provide a wide range of students with the educational opportunity only a leading research university can offer.
- To address the challenges and opportunities facing not only Chicago but all Great Cities of the 21st century, as expressed by our Great Cities Commitment.
- To foster scholarship and practices that reflect and respond to the increasing diversity of the U.S. in a rapidly globalizing world.
- To train professionals in a wide range of public service disciplines, serving Illinois as the principal educator of health science professionals and as a major healthcare provider to underserved communities.

This mission articulates UIC’s embrace of its role as an urban research university that responds to urban and global challenges through scholarship, research, education, and community engagement. Its emphasis on creating transformative knowledge, on providing learning opportunities rooted in its role as a leading research institution, and on addressing the major challenges and opportunities of the new century have particular relevance to UIC’s commitment to excellence through sustainability.
II. Charge to the Committee
In October 2012, Vice Chancellor for Academic Affairs and Provost Lon Kaufman and Vice Chancellor for Administrative Services Mark Donovan charged the Sustainability Strategic Thinking Committee to explore “what sustainability means for UIC,” a starting point that highlights the importance of serious reflection on the range of meanings and applications of the term itself in the particular context of who we are and what we stand for. The charge was described broadly:

“This committee will seek to make sustainability the lens through which we begin to view, assess and imagine our work in many areas, from our diversity initiative to curriculum innovations. You will examine what this means for how we operate at all levels including teaching, research, processes, operations, and our impact on future communities. You will look at our place within the urban environment and how that connects to our learning community. You will consider questions such as: How can we develop sustainability goals to insure the future of our programs, research and student success? How can we build lasting relationships with community partners? How do we preserve documents in the digital age? How do we help our students retain what they have learned? How do we prevent staff and faculty from ‘burning out’? These questions are ways in which to view ‘sustainability’ in its broadest context.

“While we are determined that this campus-wide effort will have concrete results, we also want to use this as an opportunity to infuse a set of sensibilities into areas beyond ecology and environment to arrive at an understanding of the significance of being a sustainable campus within a diverse urban environment.”

The goal of this thinking process has therefore been to conceptualize what sustainability means for UIC in the context of our mission, and then to consider broad strategies that employ UIC’s strengths and that recognize opportunities for growth to inform sustainability planning on campus.
III. What is Sustainability?
Sustainability is based on a simple principle: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit the fulfillment of the social, economic and other requirements of present and future generations.

The sustainability movement is a response to global threats, such as climate change, fresh water scarcity, sea level rise, resource depletion, and land erosion, that threaten the world’s ecosystems, human population centers, and geopolitical stability. Individual solutions to such a vast challenge commonly include relatively small changes such as recycling, choosing alternative modes of transportation, lowering thermostat settings in winter, and eating locally grown foods. Similarly, institutions that adopt environmental sustainability policies attempt to reduce greenhouse gas emissions, increase use of renewable energy, and implement research programs for next-generation energy technologies. These changes have been hard to come by, but at forward thinking institutions, such as UIC, there has been some progress.
Yet while such actions do reflect a shift, they are not commensurate with the scale and urgency of the problem. Minor adjustments to carbon emissions and resource consumption are welcome, but they will not transform the currently unsustainable trajectories of national, global, and institutional practices. Instead, “business as usual” prevails, with natural resources being expended, excessive harmful waste produced, and infrastructure allowed to deteriorate without adequate regard to the consequences for future generations. One of the essential insights of the sustainability movement has been that shifting to a sustainable way of life requires more than good intentions and incremental adaptations. It requires instead a fundamental change in how we live, plan, and conduct our business.

The concept of sustainable development defines that way of life. The 1987 U.N. report “Our Common Future: The Report of the World Commission on Environment and Development” (usually referred to as “The Brundtland Report”) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” While this is not the only way of understanding sustainability, it is the one familiar to most people interested in sustainability issues, and the committee relied on it for the thinking process, applying it in the context of UIC’s mission, goals, and commitment to excellence in education, research, social justice and equity.

Approaches to sustainable development are conceptually aligned with two contrasting frameworks, sometimes referred to as “weak sustainability” and “strong sustainability.” Weak sustainability relies on the notion that human capital can be substituted for natural capital, meaning that the gradual irreversible depletion of natural resources and services may be offset by human innovations that manage those losses through new technologies that generate comparable value. This view employs cost-benefit analysis, for example, to weigh the depletion of natural resources against the freedom and benefits of consuming them now and the potential to develop alternative sources of wealth for future generations. The premise is that...

the benefits that arise from the environment can be substituted for other benefits that can be bought on the market. In fact, the assumption in internalizing the costs is that environmental damage can be paid for and that this is as good as, or even preferable, to avoiding the damage in the first place.8
“Strong sustainability” rejects the notion that human capital can substitute for natural capital, asserting that there are environmental assets...for which no substitutes exist and whose repair, if it is even possible, may take centuries.”

Hazards of this approach include the prospects of “non-substitutability,” meaning that there may be no substitutes for natural resources even when we think there are, and “irreversibility,” meaning that there is no turning back if resources are fully consumed and it turns out we were wrong.

From such concerns has emerged the concept of “intergenerational equity,” which posits that future generations should have the same access we have to environmental assets. Strong sustainability" rejects the notion that human capital can substitute for natural capital, asserting that there are environmental assets (such as the ozone layer) for which no substitutes exist and whose repair, if it is even possible, may take centuries; that science cannot yet predict the results of depleting resources or destroying habitats; and that biodiversity, in which individual species of plants and animals have intrinsic value, is crucial to preserving the earth.

This idea of “strong” sustainability has particular implications for planning because it broadens the challenge from simply applying human ingenuity and technological innovations to a particular environmental problem to reconsidering how resources are allocated across societies and how decisions about their allocation are made. In framing the challenges of sustainable development, the Brundtland Report conceptualizes three interdependent domains—environment, economy, and social equity—and asserts that only a comprehensive approach that works at the intersection of all three domains can make it possible that future generations not only survive, but flourish. These domains, often called “the 3 E’s,” provide a framework for understanding how specific issues and initiatives differ and overlap. As detailed in this document, the committee modified the framework to five domains (“4 E’s and an H”) to include UIC’s strengths in health and energy.
IV. Visioning Change
The process of strategically facilitating change at UIC has been described as a four-stage Shared Governance Planning Cycle that organizes planning into shared visioning, decision making, implementation, and accountability (http://www.uic.edu/depts/oaa/strategic_plan/focusing_on_urban_excellence.pdf). Shared visioning, which occurs at the campus level and engages all identified stakeholders, begins with a charge to consider a set of overarching questions around a particular challenge, and convenes a committee or taskforce to fulfill that charge. The group’s thinking should be grounded in the campus’s mission statement. From that foundation, participants contemplate, research, and seek extensive input to produce a strategic thinking document that will inform planning. Shared visioning, also termed strategic thinking, is the consensus-building process that guides decision making at both the campus and college levels.
The Sustainability Strategic Thinking process, which began in October 2012, occurred in two phases. Phase I focused on identifying existing strengths, or “assets,” related to sustainability at UIC. It also sought to organize those assets into domains. While the convention has been to employ the three domains of environment, economy, and equity—the “Three E’s”—the committee concluded that UIC’s sustainability assets are more usefully mapped to five sustainability domains: environment, energy, economy, equity and diversity, and health, or “Four E’s and an H” (Figure 1.)

**Figure 1. Sustainability domains with examples of assets in each domain.**

UIC’s assets in these five core sustainability domains provide the foundation for developing an adaptive framework for sustainable decision-making that is broadly inclusive and considers multiple perspectives and tradeoffs across traditionally siloed areas.
In addition to the co-chairs and an outside consultant, participants in Phase I included 60 committee members and 16 students (please see Appendix). Students were particularly engaged in the thinking process, interviewing faculty, staff, and students involved in sustainability-related campus activities, conducting projects other as part of their coursework, and actively participating in committee meetings and focus groups. The process resulted in a set of key insights that helped to guide the committee’s thinking in Phase II (Figure 2). The detailed Phase I report is available at http://sustainability.uic.edu/get-involved/sustainability-strategic-thinking/#Resources.

**Figure 2. Key Insights**

Phase II, which began in the Fall of 2013, extended this collaboration to the larger campus community through town halls and stakeholder meetings (Figure 3). Focus groups gave a variety of constituencies the opportunity to weigh in on key thoughts related to these insights and the sustainability domains and to identify their own concerns. Eight student interns worked on creating a Sustainability Toolkit to help people identify and get involved in sustainability efforts at UIC (https://sustainability.uic.edu/campus-resources/sustainability-toolkit/). Three graduate students benchmarked UIC’s sustainability efforts against peer institutions as MPA Capstone projects.
Going Beyond Green
Excellence Through Sustainability at UIC

Town Hall Meetings

5  3:00PM–4:30PM  College of Medicine West
    November
    Conference Room 119A

14  3:00PM–4:30PM  Stukel Towers Training Room

18  12:00PM–1:30PM  Student Center East
    Room 713

What does sustainability mean for UIC?
What does sustainability have to do with... dining services, the Latino Cultural Center, 3-D glasses, and transcripts?

Please come share your ideas and help us think more deeply and broadly:
- How can we sustain UIC's values moving forward?
- How can we sustain the planet, and our students, staff, and faculty, at the same time?

Please review report at http://www.uic.edu/sustainability/thinking/resources.html prior to Town Hall.

Figure 3. Poster inviting campus community members to discuss sustainability at UIC.
V. UIC Strengths
UIC’s resources as a research-intensive urban serving university with a diverse student population provide an excellent foundation for undertaking the kind of fundamental change a serious sustainability effort requires. In addition to the STEM units that commonly educate students and support basic research, some of which have programs specifically focused on sustainability, UIC is home to a number of specialized units that focus on sustainability-related issues and research centers that address sustainability questions. Table 1 illustrates the range of these academic and research units.
### Table 1. UIC’s Sustainability-Related Academic Units and Research Centers

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<th><strong>Academic Units</strong></th>
<th><strong>College</strong></th>
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<tbody>
<tr>
<td>Health disparities is a signature focus of research</td>
<td>Applied Health Sciences</td>
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<tr>
<td>Civil &amp; Material Engineering: minor in Environmental Engineering, graduate programs in Environmental &amp; Water Resources Engineering, Geotechnical &amp; Geoenvironmental Engineering</td>
<td>Engineering</td>
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<tr>
<td>Master’s of Energy Engineering</td>
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<tr>
<td>Anthropology: MA program in Environmental &amp; Urban Geography, Anthropology and Global Health Program; Biological Sciences: graduate program in Ecology &amp; Evolution; Earth &amp; Environmental Sciences</td>
<td>Liberal Arts &amp; Sciences</td>
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<tr>
<td>Family Medicine Residency: UIC Health Disparities Scholars Program</td>
<td>Medicine</td>
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<tr>
<td>20+ faculty members with focus on health disparities</td>
<td>Nursing</td>
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<tr>
<td>Community Health Sciences; Environmental &amp; Occupational Health Sciences; certificate in Health Disparities Research</td>
<td>Public Health</td>
</tr>
<tr>
<td>Energy Initiative and UIC Summer Institute on Sustainability and Energy (SISE)</td>
<td>Liberal Arts &amp; Sciences</td>
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<tr>
<th><strong>Research Centers and Institutes</strong></th>
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<tr>
<td>Energy Resources Center; Sustainable Engineering Research Laboratory (SERL); Geotechnical &amp; Geoenvironmental Engineering Laboratory (GAGEL)</td>
<td>Engineering</td>
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<tr>
<td>Center for Reducing Risks in Vulnerable Populations</td>
<td>Nursing</td>
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<tr>
<td>UIC/NIH Center for Botanical Dietary Supplements Research; International Cooperative Biodiversity Group</td>
<td>Pharmacy</td>
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<tr>
<td>Institute for Health Research, Policy Center of Excellence for Eliminating Disparities; Great Lakes Centers (GLC) for Occupational &amp; Environmental Health</td>
<td>Public Health</td>
</tr>
<tr>
<td>Great Cities Institute; Institute for Public &amp; Civil Engagement; Urban Transportation Center; Natalie P. Voorhees Center for Neighborhood &amp; Community Improvement</td>
<td>Urban Planning &amp; Public Affairs</td>
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<tr>
<td>Institute for Environmental Science &amp; Policy</td>
<td>Vice Chancellor for Research</td>
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In addition to noting centers and programs, the taskforce identified policies, practices, research projects, and various ad hoc initiatives that reflect UIC’s attention to sustainability, organized them according to the “Four E’s and an H,” and considered their current contributions and future potential in each of the 5 domains:

**Environment:** We rely on our natural environment to sustain human life. It is the natural capital that we seek to preserve. As illustrated in table 1, UIC has significant strengths in environmental sustainability-related research and education across and the health sciences, STEM disciplines, urban planning and policy. Majors, minors, and certificate programs are available to undergraduate, graduate, and professional students interested either in focusing primarily on sustainability or in integrating it into their study, research, and practice.

There are also campus-wide efforts to reach institutional climate and waste reduction commitments and to model green practices. UIC’s 2009 Climate Action Plan, for example, outlines specific mitigation strategies, including energy efficiency and conservation, the use of clean and renewable energy sources, improved transportation options, improved grounds operations, and recycling and reduced waste streams. Each campus unit head is asked to designate an EcoRep, whose responsibility includes keeping their department informed about sustainability practices. Other campus programs include Recycling, led by the Office of Sustainability in collaboration with the Student Centers, Athletic Facilities, Campus Housing and Transportation and Grounds, that aims not only to reduce waste and conserve resources, but also to raise awareness of sustainability issues. Students also pay a Sustainability Fee of $3 per semester into a fund that supports student-driven projects.

UIC building standards now require that all new construction of $5 million or above be LEED-Silver certified or better. The renovation of three campus buildings to meet these standards includes conversion to geothermal energy, the installation of solar panels, and more efficient use of lights and heating (http://sustainability.uic.edu/campus-resources/buildings/#DouglasHall) (see inset “Green Buildings”).
Green Buildings

As the first green buildings on campus, Lincoln, Douglas, and Grant Halls provide numerous opportunities to implement the concept of the campus as a learning lab. Tours are conducted by the Office of Sustainability for classes, student and professional organizations, and the Summer Institute for Sustainability and Energy. Students can see renewable energy in action from the ground source (geothermal) heat pump systems that run 500 feet underground to the solar panels on the roofs of the buildings. They can also observe the production of the solar panels via a website and read about the buildings on the OS website (https://sustainability.uic.edu/campus-resources/buildings/) and the campus “Green Map” (https://sustainability.uic.edu/campus-resources/maps/#Maps).

Faculty and students have also conducted research on these buildings using for example data provided by administrative offices about the buildings to conduct life cycle analysis and research on the impact of the geothermal wells on the temperature of the earth. These spaces are preferred classroom locations for students and faculty alike.
In addition to these big projects, grassroots innovation occurs across campus in many small acts, such as the retrofitting of a bicycle for campus deliveries (see inset “Grassroots Innovation”) and student organizations such as College of Cycling and EcoCampus (http://sustainability.uic.edu/get-involved/studentorganizations/).

Registrar’s Office

Robert Dixon (left), Jeff Headrick (center), and Kevin Shalla (right), all of UIC’s Office of the Registrar, with the bike that they retrofitted for mail delivery. The office actively encourages its employees to think about new ideas for implementing sustainability. Jeff pioneered bike delivery service at UIC and the Office of the Registrar is the only office on campus to deliver mail by bike. Jeff notes that van delivery is inefficient: so many records are now electronic that all the mail he needs to deliver during a run fits into this box.
**Energy**: Energy use is central to every aspect of our lives, including transportation, the electricity grid, heating and cooling, medical diagnosis and treatment, water delivery, communication, and more. Historically, energy production has relied on extraction and use of fossil or, in the last 75 years, nuclear fuels that have had severe consequences, including global warming and pollution, along with geopolitical and economic impacts. Alternative and future energy technologies may mitigate global warming but will continue to impact the environment and economy in unforeseen ways.

UIC has established an energy policy to guide sustainable practices. The University of Illinois Energy Policy adopted by the Board of Trustees on November 14, 2007, set the general goals of measuring and reducing energy consumption and reliance on fossil fuels. UIC’s Climate Action Plan is more concrete, citing inventories of consumption and emission levels and setting specific goals, such as reducing energy use by 2% per year over three years, and cutting greenhouse gas emissions from buildings by 40% by 2030.

This is an area that highlights one of UIC’s particular strengths: collaboration among disciplines. The Energy Resources Center is an interdisciplinary public service, research, and special projects organization that works to improve energy efficiency and the environment. Staff includes engineers, economists, and other technical specialists who work with clients across the country in the areas of energy efficiency, distributed generation, biofuels and bioenergy, and utility billing data management. Energy-related research includes work on extending battery life and on sustainable transportation systems.
Equity and Diversity: The Brundtland Report called attention to the essential dependence of the sustainability movement on the achievement of greater social equity. In the context of sustainability, equity refers to the right of all individuals to a minimum standard of living and environmental quality to meet basic needs essential to human dignity and well-being. Currently, measures of energy consumption, greenhouse gas emissions, and other resource usage show that the world’s richest nations consume and produce as much as 100 times per capita as the poorest nations, reflecting both severe deprivations on the one hand, and unsupportable excess on the other. The richest nations and peoples are also better able to isolate themselves from the physical impact of environmental deprivation, while poorer nations and peoples are more often and more severely exposed. In a world dependent on global trade, however, the two ends of the wealth spectrum cannot be disentangled. UIC has been a leader in its commitment to promote diversity and social justice as a means to inclusion, access, and equity, a foundation that is essential to achieving sustainability.

Sustainability also represents “an equity commitment to the future”—an acknowledgment that future generations also have rights to the world’s natural resources and to a decent standard of living:

The idea behind not reducing the ability of future generations to meet their needs is that, although future generations might gain from economic progress, those gains might be more than offset by environmental deterioration. Most people would acknowledge a moral obligation to future generations, particularly as people who are not yet born can have no say in decisions taken today that may affect them.

As UIC plans its sustainability strategies, it must be mindful of potential unintended consequences that disadvantage some groups while advantaging others both now and in the future (see inset “Sustainability efforts must take competing needs into account”).
Questions about the impact of UIC’s current parking fee structure provide a good example of how difficult it can be to balance all aspects of sustainability and to take into account competing community needs. It currently costs less to park on campus than to take mass transit. Full-time students automatically pay a transportation fee for a UPass, which allows them unlimited use of the CTA. Employee benefits include pre-tax payment options for parking, METRA, and CTA, but transit fees are outside of the university’s control. The parking fee could be changed to incentivize mass transit use among faculty, staff, and students. More use of public transit would reduce the carbon footprint of the campus. Higher parking costs might also motivate people to live closer to campus.

But these positive outcomes must be balanced against potential negative outcomes. Increasing parking costs could impact the most vulnerable populations, low paid workers and students. People who live in parts of Chicago that are underserved by mass transit might not be able to get to campus in a safe and timely manner without driving. Moving closer to campus could be unaffordable and disruptive to their lives. As a regional employer and a commuter campus, UIC has to weigh all of these considerations.
Economy: There are financial as well as human costs to the depletion of natural resources, the consumption of nonrenewable energy sources, and the degradation of the environment—such as from the failure to sustainably manage urban waste- and weather-related impacts of global climate change. Many UIC researchers explore the intersection of development, particularly urban growth, and sustainability, in studying, for example, the costs and resource demands of repairing Chicago’s transportation infrastructure and the economic drivers of bust and boom construction cycles. The Great Cities Institute’s research cluster on Dynamics of Global Mobility investigates and proposes policy to address topics with implications for both sustainability and economics, ranging from basic research on population change to a study of the taxi trade in Asia. As more and more people around the world congregate in cities, research in areas such as urban planning and policy and global migration will inform decisions about sustainable urban practices.

In addition, as the employer of some 10,000 staff and faculty, UIC’s practices regarding equity, treatment and pay of workers, and so on have an impact beyond the campus.
Health: UIC is the area’s largest trainer of health professionals, including nearly half of Illinois’s dentists, and home to the country’s largest college of medicine. Its clinics and hospital facilities provide healthcare to underserved populations, the UIC community, and others, and UIC is a leader in research on health equity, across both majority and minority populations and rural and urban communities (http://news.uic.edu/files/2013/01/healthdisparities.pdf).

While faculty and staff working in these areas may not identify themselves as researchers in sustainability, consensus frameworks such as the Brundtland Report emphasize the fact that equity includes equity in health and healthcare. Just as individuals of wealth and influence can isolate themselves from the impact of environmental degradation at a cost to others, the benefits of access to healthy neighborhoods, nutrition, and a medical home are not equally accessible to all. UIC’s efforts to address existing differences in access to high quality healthcare include the Center of Excellence in Eliminating Disparities, a collaboration of six health science colleges and Chicago-area healthcare and other community partners. Among the Center’s goals is becoming “a university-wide crucial resource for minority health and health disparities research. As Table 1 shows, this commitment to reducing health disparities through teaching, research, and community engagement extends across campus.

In addition to specific training for health professionals in the Colleges of Dentistry, Medicine, Nursing, and Pharmacy, the School of Public Health’s Division of Environmental and Occupational Health Sciences addresses issues that directly link health and sustainability, including water quality, industrial hygiene, occupational safety, and hazardous substances management. Similarly, the College of Pharmacy is a nationally renowned center for research on botanical dietary supplements.
VI. Recommendations and Rationale
What is the magnitude of the problem of climate change? What do we know about its relationship to human activities? What alterations to the way we live are required to avert the degradation of civilized life as the planet changes? What are the changes that are inevitable and what adaptations will be required to cope with them as resources are irreversibly depleted, extinctions accelerate, and drought and storms become more common and severe? What can we still forestall if we alter global carbon emissions? How can we enable individuals, communities, and global systems to confront the inequities that result in wide variations in per capita energy daily energy consumption when greater equity could both alleviate suffering and preserve habitability on the planet? How can we best adapt to the changes in climate we are already seeing?

Such questions span nearly all of the disciplines of a major university such as UIC, and provide opportunities for engaged reflection and critical thinking in the sciences, social sciences, humanities, and the arts as we seek all avenues to communicate and comprehend. They are also emerging as perhaps the most important questions facing current and future generations, and higher education has the tools for asking and deliberating them.
The following recommendations are organized into three categories: Teaching and Learning, Research, and Practice. While we cannot isolate approaches to sustainability from one another, it is useful to consider them in terms of the university’s basic functions in order to consider how to implement specific recommendations and the complexities of doing so. As these recommendations emerged from the Key Insights, they serve as the context for each section. (See Figure 2. Key Insights are numbered clockwise in the order in which they inform the recommendations.)

1. Teaching and Learning

The recommendation for advancing sustainability through the campus’s teaching and learning activities emerged from four of the nine Key Insights. It is apparent that “Integrating sustainability into the curriculum is a natural way for UIC to educate for sustainability” (Key Insight #1). Perhaps less evident, but equally important, is that “collaboration, deliberation and cross-cultural dialogue are key aspects of sustainability” (#2). Change is enabled through dialogue and deliberation by people with diverse perspectives, in addition to knowledge acquisition through didactic lecture-based learning. It is through the former that students internalize concepts and appreciate their personal relevance. Our students are also the youngest members of our community with the longest lives ahead of them; hence global changes to the climate – with implications for human health, environmental quality, economic productivity, infrastructure quality, energy accessibility and social systems - will disproportionately impact them. In the academy, where value is placed on exploring complexity, separating fact from fiction, and respecting discourse, deliberation and dialogue in the classroom are critical catalysts.
The third Key Insight with a particular connection to teaching and learning is that “Sustainability requires culture change driven by lessons from history as well new ideas and innovations” (#3). Education is one of the primary means by which history is passed on and it is not confined to history departments, but is implicit in every discipline. Even those fields that do not directly address historical events have their own histories, which in the case of sustainability-related subjects help to explain how we arrived at the current state of the planet and point to new ways of thinking, behaving, and working to achieve sustainability goals.

Finally, “Advancing social and environmental justice and supporting cultural and biological diversity are essential to achieving sustainable communities that nurture people and nature” (#4). This Key Insight is relevant not only to teaching and learning but also to practice. The emphasis here is on learning through action that advances social welfare. Co-curricular projects, community engagement opportunities, and experiential learning are at least as valuable as the more formal curricular activities that are associated with the classroom (see “Heritage Gardens” inset). As a matter of practice, campus policies advance social and environmental justice by supporting cultural diversity, paying fair wages, and providing health and wellness support. Such actions have a tangible benefit for the UIC community and teach by example.
Heritage Gardens

In 2013, the six Centers for Cultural Understanding and Social Change launched an initiative to develop a Heritage Garden with satellite sites on the East side of campus. The Latino Cultural Center (LCC) and African-American Cultural Center (AACC) are leading this effort to engage UIC community members and members of surrounding communities in learning about and experimenting with culturally diverse approaches to sustainable and climate-friendly gardening. For example, many neighborhood gardeners in Chicago include medicinal herbs in their plantings. In addition to contributing to the biodiversity of their gardens and helping to offset the impacts of global climate change, these practitioners also transmit traditional knowledge about the use of natural resources to address health concerns within a culturally specific context.

The LCC and AACC are working with a new group of student leaders on campus called the Heritage Garden Student Task Force, which received a Sustainability Fee grant to pilot a paid internship program in summer and fall of 2013. The goal of the program is to establish a sustainable educational model with activities that can help mobilize other students on campus to link environmental sustainability and cultural diversity issues. These activities include learning about the intellectual framework that guides the garden, field days, readings and discussions, horticulture and demonstrations, story and recipe collecting, documentation and dissemination, a public program, and an art project. (Note: This photo was used for the cover of the 2013 Higher Education Sustainability Review)
In order to build on these insights, this committee recommends a campus-level commitment to strategically integrate sustainability themes into the undergraduate curriculum. In the coming years the urgency of the topic will only grow and its ramifications for critical thinking and decision making throughout the campus will be evident to all. UIC can exercise foresight by anticipating the need for literacy about sustainability, defined as a basic understanding of the science and of the implications for society and individual. Specific strategies include the following:

a. Establish a campus-level committee with appropriate diverse expertise to develop recommended competencies and facilitate the integration of sustainability topics across college educational programs.
b. Increase the number of sustainability-related courses that qualify for General Education credit.
c. Provide support for colleges and programs to collaborate in establishing interdisciplinary sustainability minors and majors, as well as non-degree for-credit and not-for-credit certificates.
d. Establish co-curricular programs that educate students, faculty, and staff about sustainability.
e. Prepare students for additional study and employment in sustainability-related fields.
f. Support sustainability-related student learning projects and community engagement opportunities, including initiatives that provide experiential learning and build student leadership.
g. Create learning opportunities for external students and the broader community, including non-credit and online courses.
2. Research

A preponderance of evidence has accumulated showing that human impacts on Earth’s ecological support systems have generated a variety of human health, environmental, social, and economic threats that, collectively, impede progress toward the goals of a sustainable society. A lesson of the 20th century is that solutions to complex problems call for an integrated, systems-oriented approach, one in which knowledge from many disciplines is brought to bear. This is an enormous intellectual challenge of the highest import. It will require advancing frontiers in science and policy to address challenges ranging from resource depletion, waste management, and energy services through the development of sustainable technologies, policies, and practices.

As the magnitude and scope of the sustainability challenge becomes clear to everyone, it will increasingly preoccupy voters, law and policy makers, and become a dominant focus of human inquiry. The questions posed earlier in connection to education will seem less and less “academic” and more matters of urgent concern. Priorities include (i) developing science, technology, and policy innovations to address the pressing environmental and energy issues central to sustainability, (ii) identifying strategies for adapting and mitigating the inevitable changes that will disrupt life for many and eventually most individuals on the planet, and (iii) addressing the social, economic, sociologic, and psychological barriers that prevent individuals and societies from embracing the adaptations identified and developed to sustain the potential for human wellbeing on our planet.

A Key Insight with particular importance to the research enterprise is that “UIC has potential to become a regional leader in sustainability” (#5). This committee believes that UIC should pursue a leadership role in addressing these challenges, both because doing so is a moral imperative and because our foundation of basic and applied, interdisciplinary, translational, and community based research is fertile ground for advancing knowledge related to sustainability. We will lead by example.

Closely linked to our discovery potential is that “The campus has great potential to be a learning lab for sustainability” (#6). We should also lead publicly by showcasing our achievements through an explicit communication strategy and establishing the campus as a forum for regional discourse on sustainability challenges. Our promise as leaders is demonstrated by our place as an urban serving research university, our general approach to exploring complex questions, and our values and priorities as encapsulated in our mission both “To create knowledge that transforms our views of the world and, through sharing and application, transforms the world” and “To address the challenges and opportunities facing not only Chicago but all Great Cities of the 21st century.”

To fulfill this potential, UIC should anticipate an increase in support for sustainability-related research. While many campus researchers are aware of opportunities in the basic and applied sciences, foundations as well as federal funders have increased their commitment to multidisciplinary projects that support topics exploring the obstacles and facilitators of societal adaptation to sustainability-related challenges.
At a practical level, understanding our strengths and limitations and building capacity are first steps. The committee recommends that:

- The campus identify and implement a process for tracking and capitalizing on funding opportunities in sustainability-related research topics.
- Colleges recruit faculty in areas where there are gaps in expertise that may result in missed opportunities to engage in foundational research and respond to national priorities.
- The university provide seed funding to advance interdisciplinary research and facilitate collaborative partnerships across disciplines. Such a strategy should be closely tied to the external funding environment and include securing extramural funds for large complex projects.
- Researchers engage communities as partners. Providing seed funds for community-based participatory action research will both foster community relationships and help neighboring communities address issues of sustainability locally.
- The university facilitate and strengthen off-campus research partnerships with industry to innovate on projects designed to improve efficiencies in energy and resource usage. This should be a priority for individual colleges as well as a priority for building research capacity.
- Students participate in research and community engagement projects that advance campus and community sustainability.

3. Practice

Organizations cannot lead convincingly if they do not lead by example. Universities have supported cutting-edge work on sustainability while doing little to adopt the lessons learned. This is one reason that a campus sustainability movement has emerged over the last twenty-five years, pressing campuses to lead by adopting sustainable practices for infrastructure design and resource utilization. A challenge to the movement, however, has been the compartmentalization of functions at most universities, when advancing sustainability goals such as greenhouse gas reduction initiatives, renewable energy strategies, green office practices, and so on requires coordination and collaboration. For instance, building designs that yield greenhouse gas reductions can be entirely offset by emissions generated by staff, faculty, and even researchers working directly on sustainability-related projects. A leader in the campus sustainability movement who has extensively documented these problems, observed that:

Herein lies perhaps our greatest challenge, the task of adopting a systems-thinking approach to continuously diagnose and determine our path forward. Without taking a systems-thinking approach, universities may end up achieving significant progress in one environmental impact area while inadvertently increasing impact on other planetary life-support systems.
This committee recommends that the campus community increasingly, progressively, and measurably adopt established sustainability standards and best practices, at both the individual and institutional levels. Administrative decisions in areas such as waste management, transportation, water and energy use, heating, and campus planning must more consistently include consideration of their implications for environmental, economic, and social sustainability.

The following recommendations are grounded in the remaining Key Insights, all three of which have particular application to planning how sustainability is practiced on campus. The first is that “Health and wellness are key components of sustainability at UIC” (#7). Just as our physical structures must minimize the production of waste, pollutants, and mining of limited resources that disregard the welfare of others, so too must all members of the UIC community—students, staff, and faculty—take care of themselves and of each other through concerted attention to healthful living practices. UIC’s extraordinary health education and research enterprise, spanning seven health science colleges, provides a nearly unsurpassable opportunity to lead health and wellness initiatives across campus. UIC’s role as a health care provider for underserved and other communities also points to the leadership the university can bring to Chicago-area sustainability initiatives.

Another Key Insight notes that “Sustainable buildings and spaces are a means to promote collaboration and education, as well as efficiency and conservation” (#8). Embedded in this insight are two fundamental observations: The design and technology of our physical space must reflect the science of sustainable architecture in terms of energy efficiency and environmental impact. This means we must build and refurbish structures that meet specific measurable benchmarks and standards. In addition, pursuing and achieving these goals is an opportunity for both learning through action and creating new physical spaces that invite the sort of collaboration that drives innovation.

The final Key Insight is a reminder of the importance of providing measurable benchmarks for our sustainability efforts: “True cost accounting is an essential tool for sustainable decision making” (#9). Planning must include a realistic understanding of the financial and human costs involved in the choice about whether or not to undertake a particular project. While this is most clearly applicable to practical issues such as waste management or energy use, it also applies to questions of equity and to health and wellness. What is the cost, both to the university and to people themselves, of employee illness or dissatisfaction? Methods such as life cycle analysis provide more thorough understanding of the true, long-term costs of decisions (see inset “BURST and Life Cycle Analysis”).
The Life Cycle Analysis (LCA) procedure is designed to address a suite of questions about products and services used by society such as: How do we balance the full economic and environmental costs and benefits of products and services to society? What is the potential for educating consumers on the impacts of the products and services they consume? What kinds of productivity gains, and improvements in economic efficiency and social equity do our products and services make possible, and how should these be measured?

The research project Building Urban Resilience and Sustainability (BURST) is using LCA as one metric in its study on the characteristics of urban systems of the future. Urban infrastructures are designed and built in response to social needs and economies of scale that urbanization has brought about. Our urban infrastructures are in many ways remarkable achievements of engineering design that were conceived and built during times of rapid urbanization; however, as they have aged and inevitably deteriorated, significant strains on their function and ability to provide services have become evident. The BURST initiative brings together experts in diverse fields to develop a new interdisciplinary approach to the conception, design, planning, and analysis of urban infrastructures that enhances their resiliency and sustainability.
Based on these Key Insights, the committee recommends that the campus embrace sustainability practices through the following strategies:

a. In both campus and college planning, provide opportunities for UIC faculty with expertise to lead in areas related to sustainable use of energy and natural resources.

b. Institute and codify policies that require new buildings on campus to meet specific energy efficiency standards that communicate their real-time energy use to students, faculty, and visitors.

c. Predictably and measurably reduce building energy use by a specified margin over the average of all other buildings on campus, by, for example, retrofitting them to be energy efficient;

d. Establish a central sustainable energy management function to fulfill these commitments by planning, guiding, and monitoring all energy usage and projects related to campus operations, including power plant operations, building operations, on-site renewable energy, and green power purchases, with specific metrics tied to targeted reductions in greenhouse gases and energy, and develop mechanisms to reinvest financial savings from these projects into future energy-saving projects.

e. Promote healthful living that is concordant with sustainability goals, including increasing alternative transportation options by improving bike and walking paths, incentivizing use of public transit, improving shuttle interconnectivity, and improving access to healthy food, exercise and health care to those members of the community who are least likely to benefit from the resources currently available.

f. Increase student, faculty, and staff access to sustainable services and resources such as affordable housing, healthy food, and recreation.

g. Reduce waste and advance environmentally responsible practices for waste disposal in research and clinical settings, based on identified best practices.

h. Identify and pursue strategies to increase the efficient use of campus facilities and infrastructure, such as weekend and evening classes that take advantage of empty classrooms.
Notes


6. http://www.epa.gov/sustainability/basicinfo.htm. This language is based on Title I, Section 101 (a) of the National Environmental Protection Act:

   The Congress, recognizing the profound impact of man’s activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. (http://www.epw.senate.gov/nepa69.pdf)


"LEED, or Leadership in Energy & Environmental Design, is a green building certification program that recognizes best-in-class building strategies and practices. To receive LEED certification, prerequisites and credits differ for each rating system, and teams choose the best fit for their project." http://www.usgbc.org/leed.


13 For example, in 2012 Iceland was the world’s highest energy user, with an oil equivalent per capita level of 16404.7 kg while Eritrea was the lowest user, at 142.3 kg (http://www.economicshelp.org/blog/5988/economics/list-of-countries-energy-use-per-capita/). See http://www.indexmundi.com/g/r.aspx?v=81000 for use of electricity; and http://www.carbonplanet.com/country_emissions for carbon emissions.

14 Padilla, 2002, p. 76.


16 Brundtland Report.


Photography:
Green Tree, Chicago. Personal photograph by Alexandra Shock. 2014. (Cover, Notes, & Appendix A background image)

http://www.uicheritagegarden.org/photos.html (background image p. 5-8)

Barrett, Christopher. University of Illinois at Chicago Daley Library IDEA Commons. N.d. Chicago. (background image p. 9-10)

Sunset, Chicago. Personal photograph by Alexandra Shock. 2014. (p. 15-20)
http://summer.uic.edu (background image p. 21-32)
https://sustainability.uic.edu/files/2014/02/Use_Mar_Recycle-Registrar-UTC_FINAL.pdf (p.26)

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Appendix

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