

## **KU Strategic Initiatives: Bold Aspirations in Action**

Universities are many things to many people. At KU, our core mission is to educate leaders, build healthy communities, and make discoveries that will change the world. Sometimes universities try to be all things to all people, and by so doing dilute their quality and effectiveness to a level of mediocrity.

A key aspect of the strategic plan is the focused investment in some big, bold ideas where KU can harness its unique assets to help make the world a better place. The four strategic initiative themes — referenced earlier but presented here in more detail — grew out of a bottom-up response to a campus-wide request for proposals. The objectives were several:

- To address emerging and escalating global grand challenges and societal issues where KU has special capabilities;
- To build scholarly communities that challenge, engage, and inspire individuals from many disciplines around a common theme;
- To enhance KU's national and international visibility and impact;
- To engage and motivate funding agencies, foundations, state government, community, alumni, and friends to provide much-needed resources; and
- To provide our students with unique experiences that will position them as highly recruited and valued drivers and innovators of social and technological change.

A total of 104 proposals were submitted by February 28, 2011. A full vetting of the proposals, as described in the introduction of this document, resulted in the following four strategic initiative themes:

- 1. Sustaining the Planet, Powering the World**
- 2. Promoting Well-Being, Finding Cures**
- 3. Building Communities, Expanding Opportunities**
- 4. Harnessing Information, Multiplying Knowledge**

These themes represent KU's highest priorities for research investment during the coming five years. Each theme statement is described in more detail in the following pages and includes a set of “bold exemplars” inspired by some of submitted proposals.

During the 2011–2012 academic year, each strategic initiative theme will be the subject of an open, on-campus summit. The format for these meetings is now taking shape, and faculty members have been chosen to plan and lead them. The summits will help form research networks, identify funding opportunities and faculty leaders, strategize about needed infrastructure, and inform priorities for future faculty hiring.

## Strategic Initiative Theme 1: Sustaining the Planet, Powering the World

### Message of Urgency:

A vital economy for the long term demands a sustainable environment and the availability of affordable energy. Interdisciplinary research on climate change and renewable resources is important to achieve a secure future that protects a fragile global environment.

**Globally**, we face the challenge of being stewards of our resources and caretakers of our environment. Answering this challenge will contribute to a sustainable future, new sources of energy, improved conservation practices, and better use of natural resources.

**Locally**, these answers will benefit all Kansans as we analyze and improve sustainability practices, develop new energy and chemical sources, conserve and use valuable state resources, and share information about our advances and developments.

### Bold Exemplars:

1. Understanding the relationships among physical systems, living systems, and social systems is critical to address complex scientific and environmental problems, such as climate change, energy use, loss of biodiversity and ecosystem benefits, and economic and political vitality. KU researchers will advance their investigations of the causes and consequences of environmental change and pursue new research opportunities at the intersection of energy and environment.
2. KU technical advances in remote sensing will lead to improved models for predicting the contribution of large ice sheets to sea-level rise. Discoveries in astrobiophysics will provide deeper understanding of the Earth's structure and the terrestrial biosphere and their relation to events in the greater universe. Informatics and modeling of natural and human systems will expand the discovery and forecasting of Earth's biological diversity under scenarios of climate change.
3. Fundamental discoveries at KU in catalysis for biomass can revolutionize the \$400 billion U.S. chemical and plastics industry, making it an eco-friendly economic engine for Kansas, where the potential exists to produce 30% of the nation's current chemical output with no carbon footprint. Renewable sources currently account for only 1–2% of energy supply in the U.S., and a sustainable energy plan involving both development of renewable sources and enhanced recovery of traditional resources is imperative for continuity and long-term viability. KU is poised to make significant contributions to the generation, storage, distribution, and public policy regarding energy from bio, solar, wind, hydro, geothermal, oil, and natural gas sources.
4. KU research on the re-engineering of vehicles, built environments, fuels, water resources, and transportation infrastructure can revitalize agriculture and industries while promoting sustainable development, energy conservation, and economic growth. KU can serve as a living sustainability laboratory for transportation systems, water quality, "green" construction, public understanding, and the humanistic and socio-cultural implications of sustainability in daily life.

## Strategic Initiative Theme 2: Promoting Well-Being, Finding Cures

### Message of Urgency:

A healthy society is significantly advanced by the translation of basic research into effective therapies and interventions. Individual well-being that spans a lifetime draws upon understanding and promoting wellness in all its forms.

**Globally**, human beings of all ages are linked by the challenge of human vulnerability in the form of disease, disabilities, adverse economic and social conditions, and life-style choices that create obstacles to health, affordability of care, and well-being. To realize our full potential as a human race, we face a collective challenge to promote health and improve the quality of life worldwide.

**Locally**, these answers will benefit all Kansans as we discover and develop preventive measures, drugs, and therapies; create employment and economic growth opportunities through their commercialization; and learn from the wisdom of individuals exploring ways to attend to the needs of all Kansans .

### Bold Exemplars:

1. Global health challenges, including HIV/AIDS, malaria, tuberculosis, and bacterial infectious diseases resistant to antibiotics, will be addressed through international policy studies, state-of-the-art drug discovery and development (including new antimicrobial drugs), a medical supply chain of local staff trained in pharmaceutical science, improved vaccine formulations that are climate-tolerant, and quality control that protects patients from counterfeit drugs.
2. Over the next few decades, the world will see unprecedented growth in the number and proportion of older adults. Aging Americans will remain more active, productive, and independent through multidisciplinary studies of neurological age-related conditions, the maintenance of physical and cognitive health, the design and construction of housing and other facilities, consumer-focused health care systems, and public policy on social support for older citizens and their families.
3. KU research will provide insight into human growth, language development, and cognition over the lifespan — from prenatal to advanced age — by bridging the molecular, behavioral, and genetic levels of analysis with an epigenetic perspective. Neurological studies will enhance understanding of growth, development, and disease, and will guide the development of new therapies across a wide array of impairments and diseases. In the realm of autism, KU will further advance treatments for its core features, involving social, communication, and behavioral deficits and excesses.
4. KU will capitalize on strengths in genetics, cancer biology, chemical drug design, bioengineering materials, and informatics to form a multidisciplinary approach to the design of novel therapeutics for cancer and a host of escalating diseases. Model systems will allow researchers to identify and validate new targets for cancer therapy, diagnosis, and prevention. There is a practical urgency in making collections of small molecules to serve as probes for understanding fundamental biological processes as well as for the design of novel drugs.

## Strategic Initiative Theme 3: Building Communities, Expanding Opportunities

### Message of Urgency:

A civil community depends upon equality of opportunity, a broader understanding of cultures, and respect for differences. International peace and prosperity demands a renewed spirit of civic engagement.

**Globally**, disparities in wealth, health care, education, political power, and social status threaten our world. Such divides are obstacles to human rights, human development, and political stability. Lack of community can root us in untenable situations. Specific answers to this global challenge will promote enhanced self-reliance and worth, stronger communities, and greater appreciation of the power of diversity and constructive discourse.

**Locally**, these answers will benefit all Kansans as we understand the nature of disparities in our state, build mechanisms for respectful discourse of complex problems, identify sustainable solutions, and improve the lives of children, individuals, and families in rural and urban settings.

### Bold Exemplars:

1. In a political era of growing skepticism and cynicism, we have as a public university a signal responsibility to address civic issues to develop well-educated, skilled, and engaged citizens. KU research, instructional, discourse, and service learning experiences will draw students from all disciplines into public life and the resolution of difficult choices facing our democracy.
2. The migrations of peoples, ideas, and resources across geographic and technological border make Kansas and the U.S. more interconnected globally. KU research will inform our understanding of the important dynamics behind the development of civic communities — both rural and urban — and the longstanding divisions that occur based upon citizenship, race, ethnicity, gender, sexual orientation, class, cultures, and religion.
3. The economic, educational, social, public health, and developmental problems facing America's children and their families are highly interlinked and can be addressed most effectively by bringing together researchers from multiple perspectives to explore and develop comprehensive interventions, education, public policy, and best practices.
4. The impact of cities on the vitality of the state can be enhanced through interdisciplinary KU programs that attract students from these communities and marshal the university's research and service engagement strengths for enhancing an increasingly urbanized Kansas.

## Strategic Initiative Theme 4: Harnessing Information, Multiplying Knowledge

### Message of Urgency:

A connected human network thrives on technology that accelerates the creation and sharing of knowledge. Harnessing the potential of information in a positive way promises to revolutionize how we live and thrive.

**Globally**, from macro to micro to nano, we create ever-smaller devices that store and communicate ever-growing amounts of information. Utilizing that information — and extracting the underlying knowledge it contains — provides the basis for modern economic development, technological innovation, health care, energy, education, national security, and overall well-being.

**Locally**, information advances will promote a robust economy and span the urban-rural divide, fostering health and well-being across our many communities. The state could become a leader in harnessing the power of information while protecting the privacy and security of its citizenry.

### Bold Exemplars:

1. Today's society runs on information — to create new knowledge, innovate, communicate, improve services and efficiencies, reduce environmental impacts, and improve health. Failure of the information infrastructure can be devastating socially and economically. We will create a multidisciplinary ecosystem for an information infrastructure worthy of trust so that information can be analyzed, searched, mined, visualized, and communicated, yet remain protected, authenticated, and secure.
2. The ability to control matter and information at the quantum, atomic, and molecular levels will lead to significant advances in energy, biorefining, medicine, and electronics at nanometer-length scales — developed using interdisciplinary KU research strengths and new degree programs in nanomaterials science.
3. KU advances in digital technologies will spur innovations throughout the academy — enabling advances in the humanities, arts, social sciences, natural sciences, and engineering — that will spur our future economic competitiveness, health care, transportation, energy supply and distribution, homeland security, and overall quality of life.
4. Educational innovations in our schools and the dissemination of information to the public will be important for the enhanced literacy and appreciation of science, technology, engineering, and mathematics (STEM). KU's efforts will create a workforce for an innovation-focused economy and a citizenry better able to understand and make decisions about technological issues.