

HIT THE GROUND RUNNING

RESEARCH AND CREATIVE ACTIVITIES COMMITTEE REPORT

Executive Summary

The purpose of this document is provide some grist for the mill as the University community turns its attention to developing a strategic plan in the next few months. The goal is not to be proscriptive with regard to investments, research priorities, policies and strategies, but to make suggestions with regard to issues that we believe will need special attention as strategic planning discussions take place. The document is divided into four interrelated sections – 1) Priority Setting Strategy; 2) Human Resources Development; 3) Organization and Management of the Research Mission, and 4) Research Policies and Compliance.

The four sections focus on themes that we expect will inform the further development and implementation of the Objectives proposed at the conclusion of the document. The major themes are:

- Consideration of being strategic about the development of strategic plan and the setting of research priorities;
- Human development in terms of: a) communication approaches regarding research, b) faculty involvement and engagement in research and creative activities, c) developing engaged graduate students, scholars and professional leaders, and d) reducing barriers to cross-disciplinary collaboration in research and creative activities;
- Organization and management of the research mission. This pertains to: a) collecting and allocating resources to support research, b) financial resources in support of research, and c) linking research to local economic development; and,
- Research policies and compliance. In this subject, the document proposes that research compliance activities should rely on the combined efforts of researchers, support staff, study participants, and others, as well as collaboration among departmental, collegiate, and central units... in other words, everyone on campus with links to the research mission. The University's goal should be to provide the information, support, and systems of administration needed to meet the laws, rules, and policies governing research in the most efficient and effective way. The University should have a compliance program that is: a) proactive, b) transparent, and c) integrated to prevent problems before they happen without impairing research.

The document concludes by proposing five objectives to be pursued as part of the strategic plan. These objectives should be examined within the context of the document. That is, the document contains philosophical positions, recommendations and observations in each of the areas addressed by the objectives presented below:

1. Develop a strategic plan that while continuing to focus on current areas of strength (i.e., environment, health, international) broadly focuses research growth without loss of diversity of activity necessary to respond to changing national and regional

opportunities and needs. Reduce barriers to cross-disciplinary collaboration (CDC) in research and creative activities.

2. Develop long-term mechanisms and approaches for human resources support that enhance research and creative activities. Key research human resource issues identified in this document include: Improve communication strategies broadly, but particularly in areas of compliance and grants management; expand programs that recruit faculty involvement and engagement in research and creative activities; continue and expand efforts to engage graduate students in our research mission and develop university-sponsored post-doctoral training programs.
3. Develop a Strategic Research Infrastructure (SRI) Plan that provides the foundation and building blocks to support the university's trajectory toward quality research and competitiveness in obtaining sponsored research.
4. Establish the mechanisms to increase research partnerships and linkages with industry and other potential local community partners. This can include the enhancement of the Research Foundation and planning for a Research Park, and increased efforts toward research that translates into measurable impacts on local communities and the State of Florida.
5. Continue efforts to develop compliance infrastructure that facilitates efficient fulfillment of legal mandates and supports a culture of participation in these efforts by faculty, students and staff.

Introduction and Overview

We propose a plan for future development of research and creative activities at FIU that uses concepts of a people-centered, “high touch” community to inform our efforts. This approach begins with the observation that the FIU community consists of students, faculty, and staff, and our goal in research is to empower that community to develop new knowledge. Toward that end, we emphasize investment in a planned and purposeful fashion to build and expand our academic programs and scholarly agenda.

FIU has made great strides in the quality and quantity of the research and creative activity of its faculty and students in a relatively short period of time. This has occurred despite continuing budgetary challenges and uncertainties. Evidence of the University’s progress is demonstrated by (but not limited to) the level of external research funding, faculty awards, publications and presentations at major disciplinary conferences, and most importantly by the significant contributions to knowledge by FIU’s faculty and students. The growth of doctoral programs and number of graduate degrees awarded, as well as the development of major professional schools has contributed to the University’s rapidly rising trajectory as a public research university. Overall, the development of a scholarly community focusing on such important areas as health, the environment, and international relations has been extraordinary. Such progress would not have been possible without the talent and dedication of FIU’s faculty and staff, who stand ready to be engaged stewards of future research and creative activity development. However, much remains to be accomplished if the vision of a high quality publicly engaged research university is to be sustained and further developed. Priorities, approaches, and structures that have served the University in the past need to be reexamined and changed, or supplemented, if our upward trajectory in quality and magnitude is to be continued. New engagements with external partners, as well as internal cooperation, need to occur. Different and more purposeful investments in research infrastructure will be necessary. A more mature research culture with a proactive emphasis on institutional and individual research ethics compliance and policies is required to meet the obligations of cutting-edge sponsored research. Engagement of students, staff, and faculty in a hands-on scholarly culture is necessary if we are to attain the robust, productive, and collegial intellectual community that undergirds a truly outstanding and engaged research university.

The purpose of the following sections is to provide some grist for the mill as the University community turns its attention to developing a strategic plan in the next few months. The goal is not to be proscriptive with regard to investments, research priorities, policies and strategies, but to make suggestions with regard to issues that we believe will need special attention as strategic planning discussions take place.

Identifying where we want to be and how best we can arrive there should begin with an analysis of where we are now and how we got there. As we think about longer and shorter-term goals, identifying benchmarks indicating progress will be important to our success. Being purposeful and transparent in discussing and elaborating our strategic plan will be needed to obtain the academic and external community engagement necessary for our success.

Although the sections below are interrelated, we have chosen to break down the discussion via the following sections – 1) Priority Setting Strategy; 2) Human Resources Development (to

include communication approaches, faculty involvement/engagement, developing graduate students and scholars, and reducing barriers to cross disciplinary research); 3) Organization and Management of the Research Mission (resources to support research, financial and infrastructure, and local economic development), and 4) Research Policies and Compliance. A common theme in each section is the desire for greater focus on quality of research activities, the needed infrastructure to support future research growth, improved internal communication regarding research issues, public engagement and partnerships, student development, and federal compliance.

1. Priority Setting Strategy

Strategic Approach:

Strategic planning identifies where an organization wants to be at some point in the future and how it is going to get there. The "strategic" part of this planning process is the continual attention to changes in the organization and its external environment, and how this affects the future of the organization. We believe that in developing a strategic plan for research, it is essential to consider four questions: 1) Where are we? 2) What do we have to work with? 3) Where do we want to be? and, 4) How do we get there?

It is essential that the University take stock of where we are, not just based on numerical criteria of sponsored research, but also on current strengths and infrastructure needs. We consider it important to ascertain our strengths, even if they were developed "accidentally" as well as the natural strengths presented by our geographic and geopolitical location and circumstances. For example, our proximity to the Everglades, being surrounded by water, and vulnerability to hurricanes has produced research strengths in environmental research focusing on water resources and disaster-mitigation. Our multicultural and diverse environment has produced research strengths in health disparities and sociopolitical dynamics. Our location has produced research strengths with international focus, particularly as it relates to the Caribbean Basin and Latin America. Therefore, we propose that a close look at where we are will also inform what we have to work with, and should inform where we want to be.

Given the specter of diminished resources from the State in the near future, we believe that it is critical to formulate a well-defined strategy as to how the University will remain actively focused on reaching its research. We recognize the need for flexibility and adjustments to unforeseen circumstances, but a strategic plan needs to endure internal leadership changes as well as periodic crises. We propose that a strategic plan include benchmarks and processes for determining and measuring follow through as well as focus and progress to reach the established goals.

Setting Priorities:

FIU has identified specific areas of research priority or major focus. These include Health, Environmental Research, International Research, and Economic Development. As part of its mission, the University engages in undergraduate and graduate education. We propose that there should be greater emphasis on the connections among research priorities and undergraduate and graduate training and research.

Our expectation is that the current identified areas of research priority will not be abandoned, as they represent current strengths in terms of faculty and resources, and they fit with the unique geographic and socio-cultural milieu of South Florida (i.e., ethnically diverse communities, connections to Latin America, unique local environments). Nevertheless, we believe that diversification in research ought to be a major consideration in setting research priorities. The ability of the University to attain incremental growth in research, as well as growth into new scientific areas, depends on diversification, and there are many examples illustrating how diversification of research areas can complement current priority areas. For example, while research on hurricane mitigation is a major successful area of FIU research, exemplified by the recent State-funded Center of Excellence award to the International Hurricane Research Center and the building of the Wall of Wind, recent communication with NOAA indicates their interest on supporting research focusing on social science pertaining to hurricane and environmental research. We already have individual researchers throughout the University whose social science research focuses on disaster mitigation and the environment, but who are not linked in a network responsive to initiatives such as the one proposed by NOAA. This diversity of research provides the flexibility to respond to specific opportunities and to the dynamic nature of research.

2. Human Resources Development

Communication Approaches Regarding Research

The essential purpose of developing strategic plans is to guide long-term decision-making. The premise is that without knowing where we want to be (and how we are going to get there), we cannot coordinate organizational resources to get us where we want to go. We propose that methodologies for communicating internally and externally are a key component of strategic planning. Our focus in terms of research is on internal communication, although we acknowledge that external communication, both local and national, is critical for the University.

Few organizations address internal communication in the same way. Determining what should be communicated to faculty and staff, when it should be communicated, and how it should be communicated is often left to the prerogative of individual staff as need. In other words, internal communication strategies are reactive and driven by a crisis or event driven. Where communication is planned, it is often due to major organization change and technological change (e.g. introduction of new PeopleSoft Modules). However, once the initiating focus has been addressed, communication tends to go back to an unorganized, and even incoherent, process. This situation is wholly inconsistent with development of an engaged academic community.

When we look at organizations that use their common culture as a strategic advantage, what we find is that they create that culture through the use of strategic, frequent coordinated communication techniques. They use multiple methods, consistently. Their training supports their cultural goals, as does their written communication (e.g., newsletters, billboards, slogans, etc). Their management communicates consistently with common messages in a number of forums (e.g., performance management, department or sub-organization meetings, award and recognition programs, etc). In addition, perhaps most importantly, management behavior is consistent with the messages echoed via other communication methodologies and feedback

from students, faculty, and staff [all members of the community] is sought, encouraged, and rewarded. Two-way communication would seem to be a key mechanism for developing an engaged academic community.

We propose the consideration of two factors in determining communication strategies regarding research (although this is broader than research). First, we need to understand that plans for internal communication should focus on a long-term period. Since the effects of communication exert themselves over an extended period, we need to look at an approach that will extend over years. Second, we need to consider a very broad approach to communication that is habit-forming. Often, even organizations that address internal communication fail because they understand the organization communication process as a limited process--one that includes only what we normally think of as communication methods. For example, they formulate a vision statement, or statement of principles, and plaster it all over the organization, without considering that the behavior of administrators and the decisions that are made in the organization are the "real communication tools." What results is a situation where the "formal" communications say one thing to faculty and staff, while decision-making and actions send a conflicting message. This is complicated by limited resources, causing research investments or even research direction (in terms of hiring faculty) to be reactive to special opportunities, while resources allocated to long-term goals are lacking.

Faculty Involvement and Engagement in Research and Creative Activities

The essential ingredient for further development as a research university is a talented, engaged faculty. Other areas outlined throughout this document are generally important contributors for faculty research productivity. However, without well-trained faculty who are passionate about discovery and creative activity, there will be no research university. In this section, we wish to emphasize that while aggressive recruitment of individuals and clusters of faculty in high priority research areas is absolutely crucial, the majority of faculty who will contribute to our further progress are already on campus. Thus, their development, retention, and research empowerment is essential to our future. Note that the existing faculty's success in research and confidence in our institution's research trajectory is also crucial for the continuing recruitment and eventual graduation of outstanding graduate students as well as the attraction of new research scholars (faculty and post-docs) to FIU.

Many believe that more of our current faculty could become active in research. Could it be that an important number of our faculty would like to be more engaged in research but lack the tools, training and time to do so? What can we do to find out what is needed and who would eagerly engage if only opportunities and resources were available? Surely, we could start by asking our colleagues what sort of support would be helpful. Some have suggested that wider dissemination of current faculty research interests would be very helpful to future and current faculty by facilitating linkages to those developing team projects with others who have expertise to contribute. We suspect a more differentiated set of rewards and teaching responsibilities for those who successfully engage in research and those who provide mentorship to junior or unfunded colleagues would be helpful. A more effective support system and research infrastructure throughout the University is another critical area we believe to be worth pursuing. Finally, more public celebrations of faculty success in discovery and

creative activity would send an important message of the high priority the University places on the quality of the fruits of our research efforts.

Finally, further development of the University from a research perspective will require greater emphasis on differentiated assignments for faculty based on teaching and research, as well as increases in faculty whose assignment is mostly dedicated to research activities. FIU needs incentives in place to promote the pursuit of research excellence and to remove any obstacles or disincentives to research excellence. Similarly, a measure of a major research university, which is lacking at FIU, is the existence of university-supported postdoctoral fellowship programs. We propose that FIU's future research objectives should include consideration of actively developing postdoctoral programs and efforts to recruit research faculty.

Developing Engaged Graduate Students, Scholars and Professional Leaders

In the longer term, the contributions of our undergraduate, graduate students and post-doctoral fellows will be a very important determinant of our reputation as a research university. In this section, we will focus on graduate students, but an intentional plan regarding both undergraduate research and the development of a broader community of post-doctoral scholars should be addressed in a future strategic plan. As an example of how different areas relate, note that graduate students' development as scholars can be significantly enhanced by mentoring undergraduate researchers and by being mentored by post-doctoral fellows.

Graduate students contribute significantly to the research productivity of a research institution. Whether acting alone or as part of a team, graduate students are directly responsible in many disciplines for the actual new discoveries credited to the University and the faculty. Thus, it is not surprising that the quality of graduate programs and the quality of graduate students are important determinants in attracting and retaining productive scholars, as well as the reputation of a research university.

FIU has made significant strides in recent years in recruiting and graduating graduate students. Much of the progress is based on the efforts of dedicated faculty mentors. Despite financial challenges, the University has significantly increased (and annualized) doctoral student stipends. The University has also instituted student-centered (Carnegie-style) reviews of doctoral programs, opened a graduate student Center for Excellence in Writing, and has developed mentoring workshops for faculty.

These are useful first steps, but much more must be done, and should be highlighted in a strategic plan. One area of concern that arises in Ph.D. program reviews is the issue of space for graduate student offices and locations for casual graduate student convenings. A strategic plan should also include more emphasis on research partnerships with industry in appropriate fields that could lead to more industry support for student internships and support for University research. It could also lead to more job opportunities for our graduates. As we discuss later in this document, external partnerships can garner more intense industrial community expertise in helping the University faculty and graduate students address important issues of economic development (job creation, spin off companies) and promote progress in areas of great interest, such as health care and the environment.

Reducing Barriers to Cross-Disciplinary Collaboration in Research and Creative Activities

The subject of Cross-Disciplinary Collaboration (CDC) in universities has received much attention in recent years. The National Science Foundation has examined said collaboration and has defined it as “The integration of the capabilities of different disciplines to address a major challenge in research or technology.” Some of the major universities that have examined CDC and judged it to be of value include Ohio State, the University of Indiana, and the Massachusetts Institute of Technology. In the case of the latter university, the NSF has pointed out outstanding successes in CDC. The following writing has drawn upon reports and presentations from Harvard and Ohio State Universities as well as the National Science Foundation.

There are multiple, well-known, barriers to cross-disciplinary collaboration, present in universities and FIU is no exception. A listing of barriers includes:

- Misperceptions by Chairs and/or Deans including: (i) that cross-disciplinary efforts between colleges and among colleges and centers will cost then overhead recovery or teaching credit, (ii) that the capabilities of centers are already contained within their college (a perception that goes against the multi-college, multi-discipline charter of centers), (iii) that space can be lost, and (iv) that no financial benefit occurs as a result of cross-collaboration.
- At FIU promotion, tenure, and annual reviews typically do not reward interdisciplinary research and teaching. This, however, may differ across colleges.

Reduction of the aforementioned barriers requires the elimination of false perceptions, and centralization of efforts for CDC including creation of financial, spatial and reward structures. Positive publicity should be given to Deans, Chairs, and Departments that engage in CDC activities. Seemingly small efforts at recognition, such as listing all the Co-PIs on awarded funds can help to create a favorable environment for CDC. A campus-wide standing interdisciplinary committee should be established and active. An interdisciplinary research culture should be created with credit given for team contributions (NSF). Recognizing cross-disciplinary input in tenure & promotion decisions (NSF) should also be addressed.

Special attention on the role of centers in an educational institution is merited. In the modern, globalized world, it is unrealistic to envision a competitive university that does not include cross-disciplinary centers. The fundamental *raison d'être* for centers is to foster, develop and create cross-disciplinary programs. Centers provide tools fundamental to the creation, development, and operation of cross-disciplinary programs. As identifiers of funds through long-term partnerships with senior funding agency personnel, center staff fills a particular niche in funding identification and attraction, which exists between the traditional individual faculty researcher and the outstanding and much needed government affairs department. Junior faculty can gain rapid enhanced credibility through collaboration with center staff. Centers can undertake those projects that do not easily fit into traditional academic pursuits but, that nevertheless contain funding nuggets for high quality (even by traditional academic standards) research. In one business model used in the corporate world, the equivalents of colleges are required to provide support for the equivalent of centers, which in turn provide services and opportunities to colleges.

It is especially critical that centers interact and work with faculty and other organizational units. In the vision of greater CDC it is essential that Centers are not viewed as islands of research separate from the traditional university structure. Rather, centers should be catalysts for increasing the overall research capabilities and opportunities. This is only accomplished if centers seek out and actively engage faculty in their projects.

One final point in CDC barrier reduction is that the University infrastructure (Office of Research, Legal Department, Research Department) must be prepared to receive the large-scale, cross – disciplinary collaborative programs which will be appearing in out-of-the-box form, e.g. for profit corporate enterprises.

Incentives to Reduce Barriers:

- Provide incentives for multidisciplinary research, including recognition of multi-authored publications.
- Provide incentives for Deans and Center Directors for their unit’s overall interdisciplinary research. Quantitative measures of this may include: (1) how many joint college or cross-disciplinary proposals or projects has your college engaged in? (2) to what degree has the college supported centers in their efforts to gain cross-disciplinary funding? And (3) to what degree have students from the college participated in workforce development efforts or cross-disciplinary training programs?

3. Organization and Management of the Research Mission

Collecting and Allocating Resources to Support Research

In order for FIU to continue to expand its research enterprise, we must develop and execute a Strategic Research Infrastructure (SRI) Plan that provides the foundation and building blocks that support the University’s strategic research goals and allows the University to continue its trajectory to becoming a well-respected urban research University. We identify several broad areas of consideration in developing an SRI:

- Increase the efficiency of services by integrating improved information technology and striving continuously to ensure that service units are flexible and customer-friendly.
- Increase staffing levels to support adequately faculty needs related to research.
- Augment investment in both core facilities and research support in order to enhance FIU’s ability to attract, develop, and retain outstanding faculty, students, and research staff.
- Develop educational and training programs to provide faculty, staff and students the tools and knowledge to conduct research that is ethically sound, as well as safe for research participants.
- Resolve short- and long-term needs for facilities and equipment.
- Develop long-range plans for animal and other core research facilities.
- Consider centralizing core and shared research facilities and provide monies for instrument maintenance and appropriately trained operation.
- Focus on the development of the FIU Research Foundation in order to facilitate growth in research commercialization.

- Plan for the development of a Research Park. This process has to begin with consideration of current research strengths and goals, and how this will inform the vision and mission of a Research Park at FIU.

The University's current facilities and administrative cost recovery (F&A) is insufficient to support the research infrastructure for maintaining the present level of research, let alone the infrastructure necessary for a trajectory of growth in a research-intensive university. A successful strategy to engage in for-profit activities requires: a) sufficient resources dedicated to maintaining and upgrading core research facilities and research-related instruments and equipment throughout the University. In addition, there is often duplication of equipment, and a history of a proprietary culture among colleges, departments, and PIs that discourage sharing of scarce resources among researchers. b) F&A resources dedicated for projected growth in the areas of research pertaining to clinical trials, commercialization and intellectual property management, Centers of Excellence, and interdisciplinary research. c) Create internal opportunities for faculty to develop sponsored research proposals, bridge funding for researchers with ongoing sponsored research programs during periods of lapses in funding, and hiring senior-level researchers with records of accomplishment in sponsored research. d) Increase participation in economic development and commercialization opportunities that benefit the University and the local community.

Financial Resources in Support of Research

There are numerous assets or resources that must be present to foster outstanding research and creative activity. Several are discussed in other sections, and include dedicated and well-positioned faculty, staff and students; appropriate research policies and administrative infrastructure; research space and equipment, and a culture of creative cooperation both internally and with external partners. For the research enterprise to thrive there must be financial resources available both to directly carry out the research activity and to indirectly support it. Of course, a major source of direct funding comes from federal agencies (such as the NIH, NSF, and DOE). Other support comes from grants and contracts awarded by state and local agencies, industry, international partners, and private philanthropy. Over time, an additional source of research investment funds may come from successful for-profit ventures involving the application of intellectual property and spin-off companies.

For the University to continue its upward trajectory in research productivity, careful attention, and increases in all of the revenue streams mentioned above will be necessary. This will need to be supplemented by a much more purposeful approach to how the University invests in research and research infrastructure than has been true in the past. In support of significantly expanding resources available, we recommend that strategic planning in this area should include the following discussions:

- 1) Where are we now? What does the data tell us about how we are doing in obtaining resources and investing in research now? For example, the F&A we currently obtain from external sources requires an internal supplement of ~\$20 million to meet the indirect costs of research. Where is that money coming from and how is it being spent? We will need to ensure for the future that our investment in research is governed by a nuanced, transparent strategic research plan at the University level as well as at the level of individual colleges and schools. This leads to the next important topic.
- 2) Where do we want to be and how do we get there in terms of our University research “skyline?” We discuss priority setting in another section, but once we have set priorities, the University needs to have the discipline and wisdom to stay on a chosen course long enough for real progress in research quality and productivity to be evident.
- 3) What does the future hold for the crucially important federal funding in areas of importance for FIU, and how do we successfully compete in what promises to be a very competitive environment? Other universities selectively work with external partners where win-win strategies can be developed. To naively promise to be all things to all people is to set ourselves up for unattainable expectations. In the US and abroad, our competitors (partners) are not standing still. We do not believe that our present level of external collaboration (i.e., with industry, other universities and agencies) will allow us to be successful, even if we are able to successfully execute several cluster hires at FIU and cooperate more effectively internally. We believe it is crucial to our future development in research that we successfully reach out and engage with our extended communities and potential partners. We need to be much more aware of what we are doing now in this arena and what the opportunities are for the future. We need to be needed and responsive to a much broader group of external sources of political, economic, and intellectual support in the research arena.

Linking Research to Local Economic Development

Universities engage in the creation and dissemination of knowledge. The three major areas in which this is exemplified are teaching, service, and research. While we focus on research activity, we recognize that teaching and training of students to be productive participants in the local economic workforce is a major element of FIU’s engagement and service to South Florida and our State. We recognize that universities can play an important role in regional economic development through their educational and knowledge creation mission. In this respect, the university is viewed as the basic factor in a knowledge-based economy and a center around which new industrial clusters are likely to emerge. The University, as an institution, generates knowledge, encourages the diffusion of new ideas upon which innovation is based, and creates skilled labor and entrepreneurs. In recent years there has been increasing interest on the part of

both university administrations and state governments to have their university systems participate in local, regional, and statewide economic development.

Our major challenge is to develop a strategic approach that identifies the best way to link with the local communities and to influence economic development in these communities. There is little doubt that FIU must seriously consider engagement in for-profit activities. Traditional sources of funding for FIU, such as the State of Florida, grants from Federal agencies, and local governments, are all subject to significant variations/fluctuations. Stability is best achieved through a broad base of diversified funding sources, including for-profit entities. We propose that a strategic approach in this area must minimally accomplish the following steps: 1) Identify core existing research, creative and service strengths within the university that can be best used for linkages with the local community, 2) Identify core existing research areas that are most amenable to developing economic and commercialization opportunities, 3) set-up mechanisms that will increase active engagement of faculty with local communities and with potential industry partners, 4) develop a research foundation that will facilitate industry engagement and intellectual property development and technology transfer, 5) develop a research park which will facilitate university-industry partnerships, and provide research faculty with commercialization opportunities.

Specific Recommendations¹:

- **Establish an On-Campus Economic Development Office.** This Office would focus on the development of economic relationships with local industry and governments.
- **Pro-Active vs. Passive Technology Transfer.** This requires a Technology Transfer Office which focuses beyond the legalistic establishment of intellectual property into greater proactive engagement with industry. Many universities have focused their commercialization and industry collaboration through the development of research parks and commercialization of intellectual property developed by its researchers. For example, prior to 1980, the federal government owned all patent rights to research conducted with federal funds. By 1980, there were 30,000+ federal patents, but only 5% resulted in commercial products. The Bayh-Dole Act of 1980 and follow on technology transfer acts enabled Universities to patent intellectual property and license or commercialize technology without turning over ownership to the federal government. Given this, Technology Transfer (TT) is more integral to the mission of research universities than ever before. Funders of university research are increasingly interested in applications/commercialization of research results. More public universities are focusing on TT as means to promote tech-based economic development. The public benefit from

¹ These recommendations are informed by "Policy recommendations for linking university technology transfer and economic development in North Carolina: A survey of best practices in the U.S." Graig S. Galbraith & Deborah L. Clayton, *UNC Economic Development Leadership Forum Discussion Paper*, February 16, 2005.

university technology transfer by moving new discoveries from laboratory to marketplace faster and more efficiently, ensuring that products and services reach the public more quickly and often. This enables researcher/inventor to participate in further development of product or process, significantly reducing the time to eventual commercialization. However, commercialization of University technology is a high risk–long term venture. On average, it takes in excess of 10 years and hundreds of thousands, even millions, of dollars to bring an invention to the marketplace.

- The Technology Transfer Office should have the following four components in its mission: 1) facilitate the transfer of FIU technologies to the public (local, state, and national in that order), 2) enhance the research and education experience of FIU researchers through technology transfer, 3) target economic development by leveraging FIU technologies, and 4) provide incentives to FIU faculty to innovate.
- It will be important to create Reporting and Performance Metrics around the four metrics of the Technology Transfer Office’s mission statement related to economic development. This means using metrics beyond the counting of patents and licenses, such as number of new innovations adopted, number of university technologies in various stages of commercialization, number of jobs created in community, etc.
- **Create “Grow your Own” Programs.** This concept pertains to programs designed to facilitate the founding and growth of local businesses and enterprises. Developing “grow your own programs” involve: 1) accepting research contracts from for-profit corporations with provision in the contracts for some sharing of the benefits arising from new discoveries or patentable inventions, 2) accepting ownership in limited liability corporations for the commercialization of both FIU originated inventions or developments and non-FIU originated developments or inventions. If the inventions are not of FIU origin then it is likely that research activities are to be undertaken by FIU to extend the development or invention, 3) high flexibility in licensing, including willingness to take equity or revenue sharing with partnering companies, 4) providing small seed grants for faculty-initiated projects and ideas, 4) greater efforts in the commercialization of faculty inventions (hardware and software).
- **Start Small Business Innovation Research Initiatives.** Currently, more than 75% of sponsored research at FIU derives from Federal sources. To accomplish the goal of greater linkage of research and creative activities with local communities and the local economy, there must be a strong effort to create incentives for university faculty to be involved with industry-tied research grant development, such as SBIR, STTR, and Broad Agency Announcement (BAA) efforts. This will require greater in-house skills to assist faculty. Additionally, the establishment of a Research Park and Business Incubators is likely to provide opportunities for FIU faculty to engage industry and community partners in these efforts.

4. Research Policies and Compliance

Compliance with legal and policy requirements of our governing agencies is a critical topic for the research function at all American universities, and inadequate response can have dramatic financial and legal implications for FIU. In planning our continued efforts in this arena, we begin with the premise that non-compliance is typically not deliberate, but results from limited subject knowledge and training of staff members, and a shortage of administrative and material support to become compliant. Furthermore, FIU is in an ongoing process to improve our compliance guidelines, but problems also arise from inadequate procedures and systems linked to compliance. However, a great deal of progress has been made over the past five years in areas pertaining to research compliance through new systems and policies developed by the Office of Research and the General Counsel. For example, a program of regular training opportunities has been organized by the Office of Research and the Office of the General Counsel related to compliance and ethics in research. Still, shortcomings remain in integration of compliance approaches and procedures and additional compliance systems will be required by planned growth in research. For example, the addition of the Wertheim College of Medicine and affiliations with hospitals will require policies and compliance systems related to clinical trials conducted in hospitals and clinics.

While addressing current and future needs in Compliance will be relatively straightforward, gaining widespread buy-in by faculty, staff, and student researchers is an ongoing challenge. Therefore, all of the issues related to communication addressed in the prior section of this document should be considered in this area as well. In terms of approaches to Compliance, there are three major issues that should be considered in a strategic plan or approach: 1) Availability of institutional systems to assist with compliance, 2) communication strategies to facilitate a culture of compliance as well as to rectify systemic gaps in Compliance, and 3) proactive versus reactive Compliance.

An integrated proactive approach to Compliance must address the following: a) Export Controls, b) Effort Reporting, c) Financial Management, d) Responsible Conduct of Research, e) Human Subjects Protection, f) Animal Welfare, g) Health, Safety & Environment, h) Classified Research, and, i) Conflict of Interest.

How should we approach Research Compliance?

FIU's research compliance activities should rely on the combined efforts of researchers, support staff, study participants, and others, as well as collaboration among departmental, collegiate, and central units... in other words, everyone on campus with links to the research mission. The University's goal should be to provide the information, support, and systems of administration needed to meet the laws, rules, and policies governing research in the most efficient and effective way. The University should have a compliance program that is: a) proactive, b)

transparent, and c) integrated to prevent problems before they happen without impairing research.

A Compliance Program should be founded on the following principles:

- **Awareness, Education and Training** - Communicating standards, procedures, and responsibilities to researchers, administrators, and others through timely and appropriate education and training.
- **Enforcement and Corrective Action** - Enforcing standards fairly and consistently; promptly investigating and resolving compliance breakdowns; evaluating and modifying the compliance program where appropriate to prevent similar problems.
- **Policies and Procedures** - Designing standards and policies that effectively enable researchers and others to meet compliance requirements.
- **Risk Assessment** - Examining research activities regularly to identify and reduce potential compliance breakdowns.
- **Communication** - Developing and maintaining effective systems of communication, including resources for promptly responding to compliance questions or concerns.
- **Monitoring and Audits** - Implementing monitoring and auditing systems to assure compliance, detect breakdowns, and identify potential problem areas.
- **Program Oversight** - Assuring compliance through senior leadership and independent oversight.
- **Roles and Responsibilities** - Maintaining clear roles and compliance responsibilities for all parties; using due care and appropriate oversight when assigning compliance responsibilities.

Enhance Quality and Impact of Research and Creative Activities - Objectives

We propose the following objectives as a means to develop an action plan to enhance the quality of research conducted at FIU and the impact of research and creative activities upon the university, its surrounding communities and the State. These objectives are framed on the basis of this document, and our approach here is to cast these objectives broadly.

1. Develop a strategic plan that while continuing to focus on current areas of strength (i.e., environment, health, international) broadly focuses research growth without loss of diversity of activity necessary to respond to changing national and regional opportunities and needs. Reduce barriers to cross-disciplinary collaboration (CDC) in research and creative activities.
2. Develop long-term mechanisms and approaches for human resources support that enhance research and creative activities. Key research human resource issues identified in this document include: Improve communication strategies broadly, but particularly in areas of compliance and grants management; expand programs that recruit faculty involvement and engagement in research and creative activities; continue and expand efforts to engage graduate students in our research mission and develop university-sponsored post-doctoral training programs.
3. Develop a Strategic Research Infrastructure (SRI) Plan that provides the foundation and building blocks to support the university's trajectory toward quality research and competitiveness in obtaining sponsored research.
4. Establish the mechanisms to increase research partnerships and linkages with industry and other potential local community partners. This can include the enhancement of the Research Foundation and planning for a Research Park, and increased efforts toward research that translates into measurable impacts on local communities and the State of Florida.
5. Continue efforts to develop compliance infrastructure that facilitates efficient fulfillment of legal mandates and supports a culture of participation in these efforts by faculty, students and staff.